TUPEA002

Evolution of Subtypes of the Human Immunodeficiency Virus Type 1 in Kinshasa over the Last 30 Years: Documentary Review from 1985 to 2015

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Background: More than 30 years after its official declaration, the infection by HIV is still a major public health problem in Kinshasa. This HIV epidemic is dominated by the group M of the Type 1, which is subdivided into several subtypes and CRF.
Objectives: The objective of this review was to expose the specificities of the HIV-1 epidemic in Kinshasa, in terms of the evolution of different variants of HIV over time.
Methods: A literature review was carried out on various publication and abstract papers presented on conference focusing on the identification of the different variants of HIV Type 1 in Kinshasa, DRC. This research was limited to the published works and abstracts presented over the past 30 years.
Results: According to the different documentary sources, the subtype A of group M of HIV Type 1 remained more or less majority over time in Kinshasa. In 1985, subtype G was predominant at 37.5% followed by subtypes a (20.8%). In 1997, subtype A was the majority with 43.7% followed by subtypes D (13.4%). In 2000, subtype A was dominant at 42.2% followed by subtypes G (25.3%). In 2002, subtype A was predominant at 39.6% followed by subtype D (13.9%). In 2007, subtype A was in the majority at 23.0% followed by subtypes C (13.8%). By 2015, subtype A was also dominant with 22.9% followed by the CRF02_AG (11.1%).
Conclusions and Recommendations: The HIV-1 molecular epidemic in Kinshasa suggests a persistence of subtype A and a significant increase in CRF02_AG in the general population over time.
Keywords: Evolution; HIV-1 Subtypes; Epidemiology; Kinshasa

TUPEA003

Bridging the Gap for Lost Opportunities

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Background: Sexual and reproductive health pertaining to adolescents and young people remains a crucial issue in Nigeria and should be made a priority. The World Health Organization report (2010) on the statistics of contraceptives prevalence in 53 African countries showed Nigeria has 14.1% contraceptive prevalence rate, unlike other African countries like Mauritius-75.8%,Egypt 60.3% and South Africa 60.3%
Program Area: The My Question and My Answer (MyQ&A) service is implemented by Education as a Vaccine (EVA) in conjunction with One World UK (OWUK). The service uses mobile phones to improve young people's access to sexual and reproductive health information and services by answering questions on Sexual and Reproductive Health making it vital.
By providing accurate and non-judgemental information on SRH issues, this service gives users the opportunity to access information that they would otherwise not have access to, helping them to make informed decisions - decisions that have the ability to not just change their behaviour but also save their lives.
Methodology: A random sample of MyQ&yA users were selected from a database of telephone numbers that had accessed the service nationwide. The phone numbers of 6,160 people were selected, and participants were sent a text message explaining that their number had been randomly selected, and they would receive a phone call as part of the service evaluation. A total of 1,300 participants were successfully reached and interviewed.
Data collection was conducted over a period of 15 working days in February 2015. Ten volunteers and members of EVA staff were involved in making the phone calls to clients and administering the questionnaire.
Results: The participants were asked how the services or information provided had helped them. Of the 77% of participants that found the MyQ service helpful. (41.5%) of the participants reported that it helped them improve their knowledge on Sexual&Reproductive Health issues, 39.9% participants reported that it helped them receive answers to their questions, others (7.1%) reported that it improved their health practice and health attitude and 6.4% stated that it helped improve their relationship with their partners.
Conclusions: From the key findings, it clearly shows there is a gap between the information provided on SRH and the use of contraceptives. Adolescents and young people are eager to know about their health and access health services easily through this platform.

TUPEA004

Emergence of Novel HIV Polymerase Mutations Associated with Treatment Intensification in Cameroon

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Introduction: Since the introduction of HAART in Cameroon in 2004, there has been a considerable increase in the rate of HIV resistance associated mutations (RAMs). Although previous studies have reported the effects of HIV drug resistance (HIVDR) in both drug naïve and ART patients, little is known about the emergence of additional site-specific drug resistance associated mutations. We modeled additionally emerging polymerase mutation sites during ongoing treatment scale-up that potentially could confer HIVDR in the reverse transcriptase (RT), *protease* (PR) and *integrase* (IN) regions.
Methods: We downloaded 4475 Cameroonian HIV nucleotide sequences from the Los Alamos HIV database covering RT (1212 sequences), PR (2696) and IN (567) genes. These sequences were assigned to periods before (1996 to 2003) or after (2004 to 2017) HAART was introduced in Cameroon. Neighbor-joining phylogenetic trees were generated using MEGA v5.2 and FigTree v.1.4.3 to assess the evolution of each sub-group. The WebLogo and AnalyzeAlign tools were used for a comparative amino acid sequence analysis of "pre-ART" and "ART" sequences to determine the emergence and quantitative change of novel mutation sites that have not yet been associated with drug resistance. All emerging mutation sites that exhibited a 5-fold change and a difference of at least 5% from pre-ART to ART sequences were structurally assessed using published crystal structures.
Results and discussion: All statistically significant emerging mutations we reported clustered around the inhibitor binding pockets. We found that 46.67% of these mutations significantly disrupted the more stable hydrophobic loop in cases where an amino acid with a hydrophobic side chain was substituted by another with an electrically charged or polar uncharged side chain. It is highly probable that HIVDR will result given that the steric effect on the loop disrupts the conformation of the active sites by rendering it too tight or too loose for RT, PR or IN inhibitors to bind. According to HIV-1 CRF02_AG being the most prevalent subtype and RT inhibitors being the most frequently used drugs in Cameroon, we observed the highest number of emerging *pol* mutations in CRF02_AG sequences and in RT.
Conclusion: The close clustering of the emerging mutations around the drug binding pockets suggest an impact on HIVDR. Phenotypic drug resistance testing and clinical assessments need to confirm their contribution to HIVDR.
Keywords: HIV, HIVDR, ART, RAMs

TUPEA005

Involvement of the Genetic Diversity of HIV-1 in the Virological Treatment Failure of First Line Antiretroviral in Kinshasa

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Background: Genetic diversity of human immunodeficiency virus affects the treatment and the emergence of resistance. Some subtypes would develop resistance more frequently than others. The aim of this study is to determine the rate of virological treatment failure and the involvement of genetic diversity and different mutations in this failure in Kinshasa.
Methods: Of the 153 Antiretroviral-naive patients who were included in the cohort, 138 patients have been received for the appointment of the 6^{th} month. Clinical parameters were recorded on individual patient charts. The determination of Viral Load (VL) was done at the Laboratory of Molecular Biology. Clinical and biological parameters of the 6^{th} month were compared with those taken at baseline of the cohort to determine the evolution of patients under treatment.
Results: At the consultation of the 6^{th} month, 138 patients (90.2%) had returned out of the 153 included. Eighty-one (58.7%) patients were women and 57 (41.3%) men. The age of patients is between 18 and 65 with an average of 37 years. Ten deaths (6.5%) and 5 (3.3%) lost have been reported. One hundred twenty-five patients (90.5%) were in clinical stage 3 and 13 (9.5%) in clinical stage 4. The median CD4 T cells was 560 cells/mm^3. The median VLs of patients was 0.90 log_{10} RNA copies/ml. Of the 34 patients in virological failure, 8 (23.5%) were on minimal failure, 23 (67.7%) on moderate failure and 3 (8.8%) on severe failure. According to the Pearson's test, VLs at 6^{th} month were highly correlated with that of inclusion, with V75 and K70 mutations for NRTIs, with V108 mutation for NNRTI well as the virological failure of treatment.
Conclusions: These results confirmed the hypothesis that high Viral Load at the start of the treatment is a poor prognosis for the development of therapy. Transmitted mutations are involved in treatment failure.

TUPEA006

Molecular Epidemiology of Human Immunodeficiency Virus Type 1 and Therapeutic Monitoring of Patients Treated in Kinshasa/Democratic Republic of the Congo

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Background: The introduction of Antiretroviral Drugs (ARVs) has reduced morbidity and mortality associated with the Human Immunodeficiency Virus (HIV) infection. But at the other hand, the massive use of these molecules created the emergence of mutant strains resistant to the treatment. The objective set for this study was to determine the different variants of HIV-1 group M circulating in Kinshasa, the prevalence of mutations associated with resistance to antiretroviral treatment and their involvement in therapeutic monitoring of infected patients followed in different centers.
Methods: A prospective cohort study conducted in collaboration with 8 centers in Kinshasa from August 2013 to October 2014. One hundred fifty-three (153) subjects diagnosed positive for HIV Type 1 and naïve of treatment participated in this controlled study. Five milliliters of blood were collected in a tube with anticoagulant EDTA. The DNA was extracted from 200 µl of Buffy Coat and RNA was extracted from 140 µl of plasma. A Quantitative PCR was performed to determine the Viral Load for all samples. A Reverse Transcription PCR (RT-PCR) and Nested PCR were performed to amplify the regions of interest for the Protease and Reverse Transcriptase (RT) for sequencing.
Results: One hundred and fifty three (153) patients infected with HIV Type 1 were selected for this work. The population consisted of 92 (60.1%) women. The median age was 37 years with extremes of 18 and 65 years. The median values of Viral Loads and rate of CD4 lymphocytes at baseline were respectively 5.68 $\log_{10}$ RNA copies/ml and 180 cells/ml. The subtype A is dominant with 35 cases (22.9%); followed by CRF02_AG (11.1%), C (9.8%), G (9.8%), K (9.8%), D (7.8%), H (7.8%) and J (5.0%). The most significant observed Major mutations were: L90M (2.0%), D30N (1.3%), and V32I (1.3%). The most frequent observed mutations for NRTI were: V75 (18.3%), K70 (9.8%), and D67 (9.2%). The most frequent mutations for NNRTI were: V179 (9.8%), K103 (8.5%), and V106 (7.2%). At the 6th month of ART (M6), 138 patients (90.2%) including 81 women (58.7%) and 57 men (41.3%) returned to their control. The median values of CD4 and VL of patients were respectively 480 cells/ml and 0.90 $\log_{10}$ RNA copies/ml. Thirty-four patients (24.6%) were in virological failure.
Conclusions: This study demonstrates a strong diversity of HIV-1 in Kinshasa, which is dominated by the subtype A and CRF02_AG, and several resistances in patients naïve of treatment.

TUPEA007

Frequencies of Molecular Markers of Resistance to Non-nucleotide Inhibitors of Reverse Transcriptase in Treatment-naive HIV-infected Patients in Kinshasa

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Background: The epidemiological surveillance of mutant strains recommended by the World Health Organization (WHO) for newly infected patients includes surveillance of mutations associated with ART, particularly Non-Nucleotide Reverse Transcriptase Inhibitors (NNRTIs) whose surveillance is crucial in patients at the beginning of treatment. The objective of this study was to determine the frequency of molecular markers of resistance to NNRTIs in treatment-naive HIV-infected patients in Kinshasa.
Methods: The present study was a cross-sectional study conducted in collaboration with different Ambulatory Treatment Centers (ATC) in Kinshasa. 153 patients diagnosed HIV-1 positive and treatment-naïve participated voluntarily. 5 ml of blood were collected in an EDTA tube from the elbow crease vein and then centrifuged at 1000 g for 10 minutes. RNA was extracted from 140µl of plasma using the QIAamp RNA Kit Mini kit from QIAGEN®. After extraction, a RT-PCR and a Nested PCR were performed to amplify the regions of interest for RT for sequencing. These fragments were sequenced by the Sanger sequencing method. Pairing of fragments was performed with Vector NTI Advance® 11.5 software and compared with the Stanford University database.
Results: 153 HIV-1 infected patients were selected for this study. The population was composed of 61 (39.9%) men and 92 (60.1%) women. The median age was of 37 years with extremes of 18 and 65 years. The most common markers for NNRTIs were: V179 (9.8%), K103 (8.5%), V106 (7.2%), Y181 (5.8%), V90 (5.8%), A98 (5.2%), V108 (5.2%), Y188 (4.6%) and F227 (4.6%).
Conclusions: Several molecular markers of NNRTI resistance have been detected in HIV-infected patients naive to antiretroviral therapy in Kinshasa. This demonstrates that genotyping tests should be systematized for treatment of HIV-infected patients to improve management.

TUPEA008

Non-CRF02_AG HIV-1 Infections Dominated by URFs In, and Absence of Transmission Links between Three Selected Neighboring Coastal Countries of West-Africa: Senegal, Guinea, Mauritania

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Background: The HIV-1 circulating recombinant form (CRF) 02_AG dominates in West-Africa (WA), having a low phylogeographic split. However, HIV-1M is increasingly diversifying, even creating complex unique RFs (URFs). Such strains may alter the genetic structure of HIV-1 epidemic and susceptibility to antiretrovirals (ARV), owing to migrant flows. We genotyped HIV-1 strains and inferred their clustering links across 3 coastal countries of WA: Senegal, Guinea, Mauritania. Compared to Senegal, HIV-1 diversity is less studied in Guinea and Mauritania.

Methods: This was a cross-sectional study primarily aimed at assessing virological efficacy of, and acquired and transmitted drug resistance to, 1st-line ARV. Bulk sequencing was performed using plasma harvested from all patients except those in Guinea who provided dried blood spots.
Subtyping was primarily done online using COMET and later confirmed by maximum likelihood (ML) phylogenetic in PhyML. Sequences were examined for recombination by bootscanning and phylogenetic analyses focused on subregions adjacent to inferred breakpoints. Retrieved sequences from Genbank were added and analyzed in ML trees that were subjected to ClusterPicker to detect transmission clusters.

Results: Of 196 HIV-1 *pol* sequences from ARV-naïve (n=128) and ARV-failing (n=68) patients, 131 (66.8%) were CRF02_AG, most common at each site. Non-CRF02_AG infections (33.2%) were mostly due to URFs (35.4%) found in 11.7% (23/196) of study patients: 8.6% (7/81) in Senegal after clade C (9.9%, 8/81), 7.1% (4/56) in Guinea and, mainly 20.3% (12/59) in Mauritania where strong clusters of 3 CRF02_AG/A3 and 2 A3/CRF02_AG were seen. Non-CRF02_AG also included pure subtypes (32.3%), complex CRFs (15.4%), subsubtype A3 (12.3%), Untypable strains (4.6%). URFs, presenting complex patterns, mainly carried CRF02_AG and A3 (47.8%) and had basally branched fragments. CRF02_AG and non-CRF02_AG trees showed no transmission cluster.

Conclusion: URFs seem to grow in numbers behind CRF02_AG. Their basal tree branches hint that diversity of these strains might be ongoing. The breadth of HIV -1 diversity would thus be amply inferred with analysis of full-genomes and dual-infections. A3/CRF02_AG and CRF02_AG/A3 spread may be due to their higher fitness and, implies candidate CRFs. But lack of epidemiological data limits conclusions. The absence of clustering may mean undersampling of HIV people. Their likely low self-awareness of risk for acquiring HIV may imply they arrive late at diagnosis. Notably, they may fuel HIV -1 genetic complexity.

TUPEA009

Genetic Diversity and Detection of HIV-1 Resistance to Protease Inhibitor in Nigeria

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Background: The changes in drug prescription is as a result of the development of mutations in HIV-1 protease which stops the activity of the antiretroviral drugs. Drug resistance represents a significant challenge in treatment of AIDS. Computational analysis could provide a more general assessment of drug resistance and could be made available to clinicians through the available sequences in databases. Hence, this study investigates genetic diversity and the presence of protease inhibitors in HIV-1 from Nigeria.
Methods: Several nucleotide sequences of HIV-1 from Nigeria were obtained from NCBI database till 2018 and were analyzed. The analysis was performed using Stanford Genotyping Resistance Interpretation Algorithm available at http://sierra2.stanford.edu/sierra/servlet/JSierra and IAS-USA 2015 Drug Resistance Interpretation list.
Results: From computational approach the results shows that the major subtypes of HIV-1 circulating in Nigeria are G, A+G, and CRF02_AG. No major resistance mutation was observed in the study. Accessory resistance mutations such as L10F, 184L, L89V and L89T were detected from this study.
Conclusions and Recommendations: This study has revealed the types of circulating protease inhibitor resistance in Nigeria. These findings suggest the importance of addressing drug resistance in the HIV treatment as observed in Nigeria and strengthening the intervention of drug adherence herby preventing switching line of treatment.

TUPEA010

Modelling HIV/AIDS Disease Progression: A Parametric Semi-Markov Model with Interval Censoring

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Background: HIV/AIDS epidemic continues to be the main killer disease in sub-Saharan Africa. The main objective of this study is finding factors affecting HIV/AIDS Disease Progression. This study was conducted to investigate the effect of factors on HIV/AIDS Disease Progression.
Methods: Patient follow-up data is obtained at Yirgalim General Hospital. A sample of 370 Patient data from a follow-up cohort is obtained at Yirgalem General Hospital. Multivariate generalized hazard regression model was employed to investigate the disease progression using both time independent and time dependent covariates.
Results: The study revealed that the risk of transition differs by patient´s body mass index. Increase in the body mass index reduces the risk of transiting into the next worst states. The effects of sex, weight, age and body mass index of patients are significantly associated with AIDS disease progression. The risk of transition differs by patient´s body mass index. Increase in the body mass index reduces the risk of transiting into the next worst states. The effect of sex, weight, age and body mass index of patients are significantly associated with AIDS disease progression. The results further revealed that the semi-Markov model with Weibull waiting time distribution has smaller log likelihood and AIC values compared to a semi-Markov model with exponential waiting time distribution.
Conclusions and Recommendations: In conclusion, transition probabilities are highly dependent on the choice of waiting times. We recommend that while choosing waiting time distributions for semi-Marko models one should consider appropriate distributions as waiting time distribution effect has a significant change on the estimated model parameters. In addition, this study recommends that concerned bodies should look at deferent contributing factors of AIDS diseases progression in addition to the ART services administered for slowing the current level of High diseased population in the country.
Key words: AIDS Disease Progression, Waiting Time Distributions, Covariate Effect

TUPEA011

The Role Played by the National Biorepository in HIV Patient Management and Clinical Research in Uganda

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Background: Central Public Health Laboratories (CPHL) is a referral Laboratory that receives a variety of samples from National health programs, public health surveillance and different research groups. National health programs include Early Infant Diagnosis , Sickle Cell , Hepatitis B viral load and HIV viral load testing. In 2016 the National Bio-repository with funding from Centers for Disease control and Prevention (CDC) through ASLM was established with an overall aim of storing remnants of clinical samples and currently houses about 35000 samples. The National HIV drug resistance testing program was later established in 2018 with an aim to detect HIV mutations which may attribute to the increased unsuppressed viral loads for patients on second line ART regimen.
Methods: A cross sectional study design was used. Retrospective data was generated from the HIV Drug resistance database Samples were collected from patients seeking routine HIV viral load monitoring from 115 districts in Uganda. Only 3,206 samples from patients on second line of ART treatment with viral loads greater than 1,000 copies/mL at a repeat test following intensive adherence counselling were referred to the genotyping laboratories. Samples are transported under cold chain for plasma samples and temperatures are monitored using electronic sensitech TempTale probes to CPHL within 2 days. Samples with detectable viral loads are stored at -80^0C for long term storage.
Results: 52% were female patients, 47% were < 19 years. 44 samples had Protease inhibitor (PI) mutations with M461, I54V, and V82A most common PI mutations.154 samples had NRTI mutations with M184V and M41L the most common mutations, 168 samples had NNRTI mutations with KI03N common mutation. 859 samples had no PI mutations.
Conclusions and Recommendations: In a centralized system it is feasible to conduct more than one molecular test on the same patient sample with the National Biorepository key in sample management and data informatics for resource limited settings like Uganda hence supporting a coordinated effort to prevent, monitor and respond to the emergence of HIV drug resistance, and to strengthen efforts to achieve the global HIV 90-90-90 target. The National Bio repository is rapidly gaining popularity as an efficient and user-friendly platform for translational research with demand for high quality bio specimens and data for biomedical research.
Keywords: HIV drug resistance, biorepository, mutations

TUPEA012

Maraviroc and HIV-1 Subtype C Predicted Co-receptor Usage in Africa: An Individual Sequence Level Meta-analysis

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Background: Maraviroc inhibits virus entry by interfering with the interaction between HIV Envelope gp120 V3-loop and CCR5 coreceptor. HIV-1 subtype C (HIV-1-C), driving the epidemic in Southern Africa, is predominantly CCR5 tropic expecially in acute infections. This analysis examined coreceptor preference in acute and chronic infections across Africa using sequences from GenBank.
Methods: HIV-1-C Envelope gp120 V3-loop Sanger generated sequences from Africa from 1988-2014 were retrieved from GenBank. Sequences with stop codons or no data on seroconversion dates were excluded from analysis. Sequences from acute infection (< 186 days post infection), and chronic infection (>186 days post infection) were separately analysed for predicted co-receptor preferences using Geno2Pheno, Phenoseq-C, and PSSMsinsi webtools. V3-loop diversity was determined for X4 viruses, and genetic subtype was confirmed by phylogenetic analysis.
Results: Sequences from acute (n=6316) and chronic (n=7338) HIV-1-C infected subjects from ten and fifteen African countries respectively were available for analysis. Overall, 518/6316 (8.2%) of acute sequences were of X4 viruses. Of the ten countries, Ethiopia (3/20; 15%) and Malawi (339/2100; 16.1%) had more than 10% of X4 viruses. For chronic infections, 8.3% (612/7338) sequences were X4 viruses, with four countries; Ethiopia, South Africa, Tanzania, and Zimbabwe having at least 10%. When sequences from early chronic infections (< 1 year) were considered, the prevalence of X4 viruses was 8.5% (156/1832). In chronic infections of 5 years and above, X4 viruses were observed in 36% (64/179), with two countries having relatively high X4 viruses: South Africa (43%, 58/136), and Malawi (24%, 6/25). A higher level of V3-loop amino acid variation was observed in X4 tropic viruses from chronic infections than from acute infections, with South Africa, Ethopia and Zimbabwe showing the highest levels of V3-loop diversity. HIV-1-C sequences clustered according to their coreceptor preference.
Conclusions and Recommendations: Our analyses illustrate that X4 viruses are present in similar proportions in acute and early chronic infections in HIV-1-C infected subjects. However, in late chronic infections, X4 viruses increase 3-5 folds, rates similar to non-C viruses. For Maraviroc to be used successfully as salvage therapy for HIV-1-C patients in Africa, preliminary virus co-receptor determination may be required.

TUPEA013

Dynamic and Geographical Distribution of HIV-1 Subtypes in Africa

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Background: Since the beginning of the AIDS pandemic, the genetic diversity of HIV-1 continues to be extensively studied; which highlights subtype heterogeneity and spatial distributions. Consequently, regular reviewing of these aspects is necessary to adapt prevention, laboratories and therapeutic strategies. In this study, we propose to update the distribution and dynamics of HIV-1 subtypes in Africa since 1990.
Methods: From 1990 to 2014, all non-redundant HIV-1 DNA sequences with minimum of 100 nucleotides were retrieved from HIV Los Alamos databases. Viral genotypes are analysed in conjunction with data from the literature (linked published studies of collected sequences). To compare the dynamic of subtype proportions within each geographical region and between common circulating subtypes, linear regression and Pearson correlation analyses were performed.
Results: Overall 100,822 sequences and their associated data collected from 48 countries were analysed. Results showed the predominance of subtype C (50.5%), followed by subtypes A (18.7%), D (13%), CRF02_AG (6.7%) and URFs (5.7%). Subtype C remains largely predominant in Southern Africa whereas subtypes A, D and C were constantly predominant in East Africa. Overall, the proportions of CRF02_AG were most predominant in West and Central Africa, following by subtypes A, G and the growing of unique recombinant forms (URFs) with high genomic complexity. Despite the almost exclusive presence of subtype B during the 1990s, non-B subtypes are increasingly encountered in North Africa. Strong positive correlations were observed between common circulating subtypes in different a location, which seems to show same spread pattern.
Conclusions and recommendations: Beyond this traditional stereotype of geographical repartition, the present work reveals a highly contrasted distribution of HIV-1 subtypes with shift of dominant subtypes over the years both in countries and regional level. This study pinpoints an ongoing spread of URFs with notable proportions of URFs in West, Central and East Africa, meriting targeted epidemiological studies.

TUPEA015

Potential of Interleukin 7 (IL-7) and CD4/CD8 Ratio as Markers of Immune Reconstitution in HIV Patients on Antiretroviral Therapy in Yaoundé, Cameroon

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Background: Although plasma viral load is the main indicator of viral progression amongst HIV-infected patients on antiretroviral therapy, immune reconstitution remains a major challenge, as using absolute CD4 T-cells as a marker of disease progression and status remains controversial. Our study aimed to evaluate the potential of interleukin 7 (IL-7) and CD4/CD8 ratio as markers of immune reconstitution amongst HIV patients on antiretroviral therapy (ART) in Yaoundé, Cameroon.
Methods: In a cross-sectional study conducted from July to December 2017, at the Yaoundé University Teaching Hospital, we enrolled 200 participants. T-lymphocyte profile, IL-7 level and plasma viral load were determined using whole blood and plasma specimens by standard methods. Graph Pad Prism 5.0 and Epi Info 7.0 software were used for statistical analysis. Comparisons between IL-7 plasma level, CD4/CD8, CD4+T-cells and viral load within the different groups, were performed using the non-parametric Kruskal Wallis test. The correlations between IL-7, CD4/CD8 ratio, CD4+T-cells and HIV loads were established using the Spearman's correlation coefficient.
Result: Enrolled participants were divided into three groups: ART success 110 (54%), ART failure 58 (30%) and Uninfected 32 (16%). The mean age of treatment was 3 ± 0.76 years. The plasma level of IL7 and CD4/CD8 ratio were statistically different between the three groups with $p< 0.0001$. There was a direct correlation between IL-7 and viral load ($r = 0, 6$; $p = 0.03$; 95% CI = [0.02005 to 0.8952]). It was inverse between IL-7 and CD4 lymphocytes ($r = -0.7$; $p = 0.03$; 95% CI = [-0.93 to 0.26]). There was an inverse correlation between CD4/CD8 ratio and viral load ($r = -0.8$; $p = 0.004$; 95%CI = [-0.9302 to -0.3887]) and between IL-7 and CD4 / CD8 ratio ($r = -0.7$; $p = 0.01$; 95% CI = [-0, 9255 to -0.1961]).
Conclusion: The variation in CD4/CD8 ratio and the level of IL-7 was statistically significant amongst ART failure and success patients. IL-7 and CD4/CD8 ratio were influenced by ART in both groups. They might be predictive of immunological dysfunction associated to the disease progression and then might be used as immunological markers in the immunological monitoring of HIV infected patients.

TUPEA016

Analysis of $CD_4^+Foxp3^+$ Regulatory T Cells (Tregs) and Immune Status of HIV Infected Patients under Antiretroviral Therapy

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Background: Regulatory CD4+CD25+Foxp3+ T cells (Tregs) are a subset of T cells that play an important role in the regulation of T-cell function. They have been implicated in a number of pathologic processes including cancers, infectious diseases, as well as autoimmune diseases. Their role in Human Immunodeficiency Virus (HIV) infection has been an area of intensive investigation but remains a matter of ardent debate.
Aim: The aim of this study was to evaluate the level of CD4 + T cells, Plasma HIV RNA and Regulatory T cells (Treg cells) in HIV infected patients (Naïve and under Antiretrovial Therapy (ART)) attending Ruhengeri Referral Hospital.
Methodology: Fifty-one HIV infected patients and fifteen healthy controls were included in this cross-sectional study. Venous blood was collected from each study participant. Viral load, CD4 cell count and CD4+ FoxP3+ Treg cells phenotyping were performed using Cobas AmpliPrep Taqman, Becton Dickinson FACScount and Becton Dickinson FACScalibur at National Reference Laboratory.
Findings: HIV infected patients showed a high percentage of Treg cells than control subjects (p=0.023) with high levels in HIV patients on clinical stage III. Low level was observed early in primary HIV infection and patients in stages I and II. A relative frequency of Tregs correlates with the viral load levels and disease progression (r = 0.76 and p=0.0598).
Conclusion: HIV-associated defects in cell-mediated immunity are of particular importance, as these impairments lead to poor control of HIV replication. Further studies are needed to investigate if Tregs could be used as a new biomarker for HIV infection and disease progression.

TUPEA017

Natural Killer Cells Kir Genes Profile Implicated in HIV-1 Disease Progression in the Context of Anti-retroviral Naïve HIV-1 Infection

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Background: In the absence of a functional adaptive immune response due to HIV infection, Natural Killer (NK) cells could play a prominent role in controlling the virus by direct lyse of virus-infected cells and immune-regulatory activity. NK cell function is tuned by the engagement of several receptors expressed on the cell surface, including both inhibitory and activating killer cell immunoglobulin-like receptors (KIRs). Direct genetic evidence to support their implication in HIV-1 infection acquisition and progression is lacking. This study aimed to assess the profile of KIR genes in the context of ARV naïve HIV-1 infection with respect to biological markers of HIV-1 disease progression.
Methods: 24 ARV naïve HIV-1 positive and 20 HIV negative people from the Afrodec cohort in CIRCB (Yaoundé, Cameroon) were recruited to be part of this study. After venous blood drawing, Peripheral Blood Mononuclear Cells (PBMC) were isolated by density gradient centrifugation. DNA extraction was performed according to the manufacturer's instructions (Qiagen) following by KIRs molecular typing using PCR-SSP technology and Agarose gel electrophoresis to identify allelic variation within the NK cells KIR genes. Statistical analysis were performed using Prism (Graphpad 5) soft-ware. Non-parametric test (Spearman) were used for comparison between groups; p-values < 0.05 were considered statistically significant.
Results: KIR2DS2, an activating gene was least frequent in HIV negative (HIV-) compared to HIV-1 infected (HIV+) people,with 55% versus 79% (P= 0.03). KIR 2DL2 and 2DS1 were least frequent in HIV-1 positive compared to HIV- group with 37.5 % versus 60% (P= 0.04) and 54% versus 85% (P= 0.02) respectively. These two genes were also completely absent in HIV+ group with a viral load > 4.5 Log_{10}. KIR 2DS1 gene was absent in HIV+ participants with a viral load >4.5 Log_{10}, where KIR 2DS3, 2DS5 and 3DS1 showed low frequencies (< 20%) with viral loads>4.5 Log_{10}. More Interesting, HIV+ with CD4 < 200/mm^3 did not possessed KIR 2DL2 and 2DS1 as observed among HIV+ with high viral load (VL> 4.5 Log_{10}), where KIR 2DL5 showed low frequency (10%).
Conclusions and Recommendations: KIR 2DS2 is more relevant in HIV-1 acquisition, people bearing this gene are more susceptible to acquire HIV infection. however, KIR 2DS5, 2DS3, 2DS1, 2DL2 and 2DL5 seem to be implicated to resistance to HIV-1 disease and to a significant control of HIV-1 replication among ARV naïve HIV-1 infected people.

TUPEA018

Low-level CD4⁺ T Cell Activation among Seronegative Partners in HIV-1 Heterosexual Serodiscordant Couples Is Associated with Increased Condom Use

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Background: Some individuals remain persistently HIV-1 seronegative despite multiple high-risk exposures to the virus (HIV-exposed seronegatives or ESN). Different mechanisms may influence host resistance to HIV-1 infection. Previous studies have observed low levels of CD4⁺ T cell activation in ESN populations. However, the role of immune activation in resistance to HIV-1 infection remains controversial.
Methods: Twenty six ESN subjects in HIV-1 serodiscordant couples were compared to twenty six unexposed controls in HIV-seronegative couples. All couples were enrolled at the Fann University Teaching Hospital in Dakar, Senegal. Blood samples and standard questionnaires with information on sociodemographics and sexual behavior were collected. Herpes simplex virus type 2 (HSV-2) infection was detected by ELISA. Levels of CD4⁺ and CD8⁺ T-cell activation (CD38 and HLA-DR) were measured in fresh whole blood by flow cytometry.
Results: ESN subjects showed lower expression of CD38 on CD4⁺ T cells than controls ($p = 0.02$). This was found to be associated with the frequency of using condoms: 88% of ESN subjects reported some degree of condom use compared to 0% of controls ($p < 0.001$) and ESN reporting always using condoms showed lower CD38 expression levels than ESN reporting never, rarely or often using condoms ($p = 0.003$). ESN subjects showed a higher HSV-2 seroprevalence than controls ($p = 0.06$), but this was not associated with CD38 expression levels. No differences in HLA-DR expression were found between ESN subjects and controls.
Conclusions and Recommendations: Low-level CD4⁺ T cell activation among seronegative partners in HIV-1 serodiscordant couples is associated with the more frequent condom use in this population. Our findings underscore the need to take potential changes in sexual behaviour into account when analysing correlates of protective immunity in high risk populations.

TUPEA019

Factors Influencing Non-VL Suppression among PLHIV in Borno State: A Case of USUMH

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Background: The 2019 NAIIS report showed that the prevalence of HIV in North East Nigeria is 1.1%. Despite the increasing number of patients on ART in Nigeria, there are inadequate information about viral non-suppressed clients and its different determinants among PLHIVs enrolled into care in resource-limited and security challenged settings like Borno state. this study will evaluated the suppression rate and the associated factors for non-suppression at a GF supported site in Borno state
Methods: A case study was conducted using routinely collected VL test result collected in USUMH Borno State. Data were gathered from January 2019 to May 2019 through LAMIS software using patient records. From the care cards we obtained demographic, economic and clinical data. VL data for 492 patients on ART for 6 months was analysed and used. Variables in the care card were compared using chi square test. Statistical tests were two-sided and a p-value < 5% was considered statistically significant. The STATA 14 statistical software was used for all analyses. However, logistic regression was employed to identify various factors associated with viral non-suppression in the selected facility in the State.
Results: Study comprises of 492 patients; 279 (69.40%) were females while the remaining 123(30.60%) were males. Overall non-suppression rate was 16.92%. 19.2% of the patients age 25-29 were virally unsuppressed. Also, 58.73% of the married patients were virally unsuppressed. In term of educational qualification, 42.11% of the patient with no education were virally unsuppressed. Viral non-suppression was higher among repeat testers. The odds of viral non-suppression increased with age, with children aged 5-9 years (OR= 1.97, 95%CI = 0.02-169.913) and adults (OR= 3.33, 95%CI = 0.064-171.66) registering the highest odds. Last clinical stage (OR= 1.54, 95%CI = 0.499-4.76) and Body mass Index (OR= 1.4, 95%CI = 0.5-4.33) increased the odds of viral non-suppression. However, being on second/third line regimens (OR= 9.04, 95%CI = 0.22-0364.59) protected patients against viral non-suppression.
Conclusions: Study concluded that demographic, economic and clinical data employed for this study increased the odds of viral non-suppression while second/third line ART regimens were protective against non-suppression. The study recommended that proper follow up by the case manager and intensified patients' adherence support for repeat testers after suspected failure of the drug.

TUPEA020

Is Retesting an Approach to Be Implemented in All Settings? An Experience from a Pilot Conducted in Mozambique

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Issues and Background: Mozambique begin the implementation of test and start (T&S) strategy, in August 2016. With the need to ensure that only really true HIV positive patients are included on treatment, retesting becomes an important approach to confirm that solely true HIV positives are enrolled in care and treatment. A pilot to determine if retesting is an approach to be implemented as national strategy was conducted by the Ministry of Health (MoH) in Mozambique in 2017.
Descriptions and Methods: Between July and December 2017, the MoH conducted a pilot in 6 HFs in 6 provinces across the country on retesting. All new HIV positive diagnosed patients should be retested by another testing provider before enrollment in care and treatment. They were retested twice by two different providers. Register tools were developed and used for this pilot. Routine data on retesting were collected from the tools defined for this pilot. A cascade analysis was conducted comparing the number of patients newly diagnosed during the pilot with the number retested and from those, the number with a positive confirmative result. Finally, from the retested positive, the number enrolled in care and treatment.
Lessons Learned and Results: In the retesting pilot period, from the 1891 new diagnosed patients, 1795 (95%) were retested and from those, 1793 (99.9%) were confirmed to be HIV positive. From these positives, 1716 (96%) were enrolled in care and treatment. The results shows a concordance of 99.9% for newly diagnosed retested for HIV.
Next Steps and Discussion and conclusions: Retesting is an approach to discard HIV negative patients preventing to include them on treatment as well as confirm that the positive are really positive ensuring that only who needs benefits from treatment. The pilot revealed that in Mozambique, as different type of health facilities taking into account context variety, were selected covering north, center and south zones in the country, retesting may not be an approach to be implemented as a national strategy. HIV testing results seems to be accurate and only true HIV positive patients are being included on treatment.

TUPEA021

HIV-P24 Antigen among HIV Antibody Seronegative Pregnant Women Attending Adeoyo Maternity Teaching Hospitals (AMTH), Ibadan, South Western Nigeria

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Background: HIV can be transmitted from an HIV-positive woman to her child during pregnancy, childbirth and breastfeeding. Mother to child transmission (MTCT) accounts for vast majority of new infections among children in Nigeria. Without proper testing and treatment, the likelihood of HIV MTCT is about 45%. This study therefore investigated the prevalence of p24 antigen among HIV antibody seronegative pregnant women in AMTH, Ibadan, southwestern Nigeria.
Methods: Six hundred and seventy two (672) pregnant women aged 22-42 years initially negative for HIV antibody by rapid screening kit, Determine™ HIV-1/2 (Abbott Laboratory, IL, USA) and re-screened with Immuno Comb® II HIV 1/2 (Bispot kit PBS Organics and Israel 2005). The samples were further tested for the presence of HIV antibody and p24 HIV core antigen using ELISA kits (Genscreen TM ULTRA HIV Ag-Ab) following manufacturer´s instructions. Data was analyzed with packages within SPSS software and p value ≤ 0.05 was considered significant.
Results: Twenty three (3.4%) of 672 pregnant women tested positive for the p24 HIV core antigen. Fifteen (65.2%) of the 23 had multiple children already while 8 (34.8%) did not have any. 10 (43.4%) were from polygamous family. There was a significant association between HIV p24 antigen with polygamous home (p= 0.03) and multiple children (p=0.05).
Conclusions and Recommendations: This study reported high prevalence of HIV-P24 antigen among HIV antibody seronegative pregnant women. There is an urgent need to optimize the antenatal screening of pregnant women in Nigeria by the inclusion of p24 antigen testing. The WHO has to compel Nigerian government to urgently adopt her blood safety strategies to prevent mother to child transmission.

TUPEA022

HIV Seroprevalence, Self-reported STIs and Associated Risk Factors among Men who Have Sex with Men: A Cross-sectional Study in Rwanda, 2015

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Background: In many populations, men who have sex with men (MSM) are at a high risk of HIV infection. This study aimed to estimate the burden of HIV, other STIs and risk behaviours among Rwandan MSM.
Methods: In this cross-sectional study, we recruited through peer referral men aged between 18 and 60 years, who reported sex with men at least once in the 12 months prior to the survey. Representativeness was increased using 'seeds' from a variety of sources. Signed informed consent was obtained from all participants. Data on demographics, risk behaviours and self-reported STIs were collected through an interviewer-administered questionnaire. We screened all eligible participants for HIV using the Rwanda-approved protocol for rapid HIV detection.
Results: 504 MSM were recruited from five major cities in Rwanda. Participants were mostly young (median age 23 years, range 18-55 years) and unmarried (484/504, 96.0%). Thirteen per cent (65/504) of the participants reported past gonorrhoea and/or syphilis infection. Of 504 MSM, 53 (10.5%) reported they were diagnosed and treated for gonorrhoea in the past 12 months and 24 (4.8%) tested positive for HIV. A high proportion (232/504, 46%) reported receiving payment for sex by a man, with almost half of these reporting on more than three occasions (107/232, 46%). Many reported having had an HIV test within the past 12 months (385/504, 76.4%). In multivariate logistic regression models controlling for age, being paid for sex was associated with higher odds of past STI (OR 3.36 (1.82-6.43]; P< 0.001) and testing HIV positive (OR 3.13, P< 0.05).
Conclusions and Recommendations: Further research is needed to understand the high rate of payment for sex in this population, which appears to be a major risk factor for STI including HIV.

TUPEA023

Impact of Peer to Peer Mechanism in Increasing Access of Pregnant Women to E-MTCT/PMTCT Services in Nigeria

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Issues: Perinatal transmission of human immunodeficiency virus (HIV) continues in Nigeria because of the poor use of prevention of mother-to-child transmission of HIV (PMTCT) services.Nigeria has the largest number of children acquiring the HIV infection, nearly 60,000 in 2015, a number that has remained largely unchanged since 2009. Sadly 60% of HIV-infected pregnant women did not receive antiretroviral (ARV) drugs for prevention of mother-to-child transmission from HIV (PMTCT). Achieving Zero new infections must have its fulcrum in effective PMTCT.
Descriptions: 24 young women living with HIV in Nigeria were selected and trained for a period of 10 days as Peer Counsellors on Treatment Education and Adherence. The knowledge and skills of the young women were built and provided with a target to reach at least 20 other young women within the project period of 9 months. The trained young women were supported with monthly stipends to cover their communication and follow-up visits to the registered women living with HIV and for transport support to the monthly cluster review meetings.
Lessons learned: The 24 trained young women were well received by their peers and the success of the program was measured through the number of registered women with HIV and number that were pregnant. A total of 642 pregnant women living with HIV were registered across the 12 communities in Port Harcourt, Nigeria. Some of the trained young women reached above the targeted 20 cohorts.
Next steps: Program implementers should inculcate the use of people living with HIV to reach other people living with HIV (new intakes) to counsel and guide them on treatment education, adherence and the prevention of mother to child from HIV. These will go a long way in reducing the fear and unjust treatment from those who are not in the same shoe like them, This will mean greater involvement of people living with HIV and contribute towards the achievement of the first UN "90" target thereby zero new infections.

TUPEA024

Key Population, a Major Driver of HIV Epidemics in Abia State Nigeria

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Issues: The goal of the study was to provide information on the size and location of KPs in the State. The specific objectives of the study included to develop a size estimation of FSW, MSM and PWID in Abia State.The study methodology was in two phases - Level 1 and 2. The Level 1 phase involved interviews conducted amongst the secondary key informants (KIs) who helped in identifying spots (locations) were KPs could be found, their estimated minimum and maximum numbers, peak periods of operations of the day. The Level 2 phase involved validation of the spots by interviewing the primary key informants who are the KPs at these spots and also helped in identifying other spots that were validated. The result of the study provides critical data for HIV&AIDS programming amongst FSWs, MSM and PWIDs in the State to help in reduction of HIV prevalence.

Descriptions: Data from the State Epidemiology, Response, Policy Synthesis (ERPS, 2009) shows that the epidemic in the state is mixed and the primary drivers of HIV epidemic in the state include: high prevalence of risky sexual behavior such as commercial sex workers, early age of sexual debut and delayed age of marriage, low condom use during high risk sex, intergenerational sex, multiple concurrent partnerships and low HIV risk perception.

Lessons learned:

• Generally warm reception of the study team within the communities
• Sample condoms helped in creating enabling environment to gain access to KPs/spots in comminuties
• Use of social mobilizers (SMs) 'opened the door' ensured access to KP spots especially for PWID and MSM
• Different SMs were used based on local knowledge of each location/spot and helped with access, as against using one SM all through
• There may be a need to explore incorporating program talks (e.g. HIV risk reduction/condom demo) during such studies to seize the opportunity especially as communities have been without HIV programming for a while

Next steps: • There's need to plan for/improve on KP interventions
• There's need for local studies annually to regularly update the size of KPs to keep abreast with dynamic nature of KPs
• Policy makers in the state to create enabling environment for KP health programming

In conclusion, the KP Mapping and Size Estimation study conducted was necessary in order to provide the much needed data to enable stakeholders in the health development sector - donors, government, implementing partners and other NGOs program better for health interventions for the KPs.

TUPEA025

Seroreversion in Infants Born to HIV Seropositive Mothers

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Background: In Cameroon, HIV prevalence among pregnant women is 7.8%. Children born to these women will therefore be exposed to HIV. Early infant diagnosis of HIV remains the key to accessing ARV treatment. WHO recommends serological test for children more than 18 months but this age cut-off varies from one study to another. This study aimed at determining the time of disappearance of maternal antibodies in HIV-seronegative children born to HIV seropositive mothers in Cameroon in order to establish in these newborns a diagnostic based on serology.
Methods: This study took place at the biyem-assi district hospital in Yaoundé from February 2016 to May 2016. We performed serological test on HIV-PCR negative infants born from HIV seropositive mothers aged from 06 months to 05 years.
Results: On the 67 infants recruited 37(55%) where females and 30(45%) were males. According to HIV status we obtained 60(88%) seronegative infants and 7 (12%) seropositive infants. Among these 07 infants 06 were breastfeed and only 01 was feed with artificial milk. The distribution of HIV status according to age group showed that 01 infant was positive within the age group of 12-18, 24-30, 30-36 months and 4 infants within the age group of 6-12 months.
Conclusions and Recommendations: Based on our results, at 12 months almost all maternal antibodies had disappeared given the very small proportions of HIV-positive infants above 18 months of age. This permits to confirm the fact that the usage of RDT for HIV diagnosis on infants over 18 months as recommended by WHO is still reliable, but should be associated to clinical diagnosis.

TUPEA026

Early Sexual Debut and Associated Risk Factors among Youth in Rwanda, 2015

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Background: Initiation of sexual intercourse at an early age is a well-known risk factor for human immunodeficiency virus, other sexually transmitted infections, and reproductive health problems. Understanding the determinants of early sexual debut is important to inform effective interventions. We conducted this study to determine factors associated with early sexual debut among youth in Rwanda.
Methods: We performed a secondary analysis using data from the Rwanda Demographic and Health Survey (RDHS) 2015. We included data for all 7,532 youth aged 15-24 years who participated in RDHS 2015. We defined early sexual debut as having sexual intercourse before 18 years. We statistically tested demographic, behavioral, socio-economic and biological factors to ascertain their association with early sexual debut among our study population.
Results: Overall, 3,008 (39.9%) of the respondents had ever had sex (40.5% females; 38.6% males). Of these, 1,375 (45.7%) engaged in early sexual intercourse. Among the youth with early sexual debut, 277 (19.4%) reported using a condom during the first sexual intercourse. Multivariate analysis showed that among youth aged 15-24 who had ever had sex, those aged 20-24 at the time of the survey were less likely to have engaged in early sexual intercourse (Adjusted Odds Ratio {AOR}=0.05; 95% Confidence Interval {CI}=0.01-0.18) compared to youth aged 15-19 years. Non-consensual sex was also associated with early sexual debut among the youth (AOR=3.39; 95%CI=1.66-6.92).
Conclusions and Recommendations: Our study indicates that a large proportion of youth in Rwanda engage in sexual activity before they turn 18 years. We recommend strengthening policies against sexual violence especially among the youth and educating them on the importance of delaying sexual intercourse.

TUPEA027

Positive Predictive Value for HIV Mother to Child Transmission, in Area with Limited-resources, Bilene-Mozambique

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Background: Mother-to-child transmission is the primary mode of transmission of HIV in children younger than 15 years of age. Without ART (Antiretroviral therapy), the risk of HIV transmission from infected mothers to their offspring is 25-40%, with 10-25% occurring during pregnancy, 35-40% during labor and 35-40% during breastfeeding.
Methods: A retrospective cohort study of pregnant HIV positive mothers and their respective newborns, with PCR results (Polymerase Chain Reaction) from January to December 2017. For data analysis, we perform logistic regression and chi-square with statistical software SPSS v.20
Results: Ninety HIV positive pregnant women, aged between 19-45 years, mean age 28 ± 5.7 years, were included from two peripheral health units. Being the largest number 75.6% (68) from Macia Health Centre and 24.4% (22) from Praia de Bilene Health Centre.Of the births, 33.3% (30) were born positive, and 66.7% (60) were born negative. Among the seropositive children; positive predictive variables for HIV transmission from mother to child, mothers with optimal ART adherence (8.0 IC95% 3.7 - 17.0; $p < 0.0001$); mothers with CD4 cells lower than 200 cells /microliters (8.0 IC95% 7.5-9.8, $p < 0.0001$), Viral load of the mother less than 1000 copies /milliliters (4.5 IC95% 2.7 - 7.07, $p < 0.0001$), children with low birth weight below 2500 grams (4.7 95% CI 3.0 - 7.4, $p < 0.0001$)
Conclusions and Recommendations: Both ART Adherence and Viral Load less than 1000 copies/ milliliters are strongly related to HIV transmission from mother to child, which suggests that patients may be adherent to a previously failed ART, and that viral load lower 1000 copies/ milliliters not equal to ART suppression. It is recommended to change the Mozambican protocols towards HIV lower suppression 20 copies/ milliliters.

TUPEA028

Predictors for Virological Non-suppression among HIV Infected Pregnant Women in Lira, Northern Uganda: A Cross-sectional Study

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Background: Sustained viral suppression is effective in prevention of mother-to-child suppression. Viraemic profiles and rates of viral non-suppression among HIV infected pregnant women in northern Uganda are not yet fully understood. We aimed to determine the prevalence of viral non-suppression and its associated factors among HIV infected pregnant women in Lira.
Methods: This was a descriptive, analytical cross-sectional study consisting of 299 HIV infected pregnant women recruited from Lira Regional Referral Hospital while receiving their antenatal care. Blood samples were drawn during pregnancy, shipped under cold-chain to the Uganda National Health Laboratory Services for viral load testing. Data analysis of exposure variables and viral load counts included descriptive statistics and multivariable analysis using a general linear model of the binomial family with a log link to estimate odds ratios in STATA (version 14).
Results: The mean age of the women was 29.8 years (SD 5.3) . The median duration for ingestion of antiretroviral therapy (ART) was 48 months (IQR 24, 72). Majority of these women - 87.2% (239) were ingesting efavirenz-based regimens. Of the 299 women, 69.6% (208) had an undetectable viral load (< 50 copies/ml), 19.1% (57) had 50 - 399 copies/ml and 3% (9) had 400 - 999 copies/ml. The proportion of women that did not achieve viral suppression below 1000 copies/ml was 8.36% (25) (CI 5.5, 12.1). Of those that did not achieve suppression, 48% (12) were aged 30 - 39 years, 60% (15) had attained an education of 0 - 6 years, 64% (16) were unemployed, 28%(7) were not natives of northern Uganda, 88% (22) had 0 to 4 children, 52% (13) were 20 - 27 weeks pregnant, 84% (21) were ingesting efavirenz-based regimens, 52% (13) had ingested ART for 0 - 36 months, 52% (13) were not using any form of family planning yet 64% (16) intended to have the baby that they were carrying, 60% (15) feared what the public's opinion was on their HIV status. At multivariable analysis, the women that were not natives of northern Uganda had three times higher odds of not achieving viral suppression (AOR 3.02, 95%CI = 1.02, 8.9)
Conclusions and Recommendations: While routine virological monitoring is integrated into HIV care in this setting, attention should be drawn to non-native HIV infected women receiving care within Lira. Attention should also be drawn to HIV infected women who desire to have children, those not using any birth control and those suffering from stigma.

TUPEA029

Enhancing HIV Prevention among Girls by Fighting Child Marriage and Sexual and Gender Based Violence

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Issues: In Malawi, early sexual debut and marriages, initiation and marriage systems, intergenerational and transactional sex, multiple partners, and sexual coercion expose youth especially girls to HIV. More than half of Malawian youth marry while still in their teens and 69% of sexually-active young people have multiple partners. Example, 30% of young women aged 15-19 years have first sexual intercourse before they were 15 years old making themselves more vulnerable to HIV and AIDS, STIs and maternal death. Similarly, in Traditional Authority (TA) Kilupula, Karonga district youth especially girls were affected by the situation.
Cases of Sexual and gender based violence as well as early child marriages among girl children were high in the area which exposed girl children to HIV infections while denying these girls' rights of accessing education. The situation was influenced by culture, poverty and ignorance.
Therefore, FOHOP carried out a project to enhance protection of 3500 girls from Early child Marriages and Sexual and Gender Based Violence (SGBV) situations.
Descriptions: The main goal was to enhance protection of 3500 girls from Early child Marriages and Sexual and Gender Based Violence (SGBV) situations which were increasing the rate of new infections of HIV among girls.
On Intervention approaches used by the project:
The project first did baseline data collection from health facilities and schools.
Trained 50 girls of 10 to 17 years in how to protect themselves and others against HIV infection, early childbearing and marriages. Then went on to establish 10 girls' clubs in schools and train and identify 11 young women as paralegals**.**
Conducted awareness campaigns against child marriages, SGBV in relation to HIV infections.
Trained 10 local leaders, 10 religious leaders, 10 teachers, 10 Village development committees members.
Lessons learned: 17300 youth and 13930 adults were sensitized for HIV testing.
4830 Youth went for HIV testing and counseling from which 123 were identified as HIV positive.
123 Youth identified as HIV infected were enrolled into care and treatment at their nearest health facility.
Therefore, enhancing Youth's HIV/AIDS Prevention, Treatment, Care and support is possible and youth's death can be reduced.
Next steps: There is need of mobilizing youth for HIV testing because timing treatment to youth will save lives of the future generation.
Keywords: Child marriage, HIV infection, HIV testing, Sexual.

WEPEA001

Assessing Outcome of Infants Born to HIV-positive Mothers Under PMTCT Program in Gicumbi District: A Retrospective Cross Sectional Study, Jan 2012 - Sept 2016

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Background: The elimination of the New HIV Infections among Children was the global plan by 2015. Elimination of mother to child HIV transmission was recommended in 2013 by administration of ART regardless of CD4 cell count. Rwanda's epidemic is generalized with a 3% adult prevalence and women in all regions have a higher prevalence than men and Rwanda faces gaps to implement epidemic control and an HIV-free Generation as system include financial support a cost effective of PMTCT. The aim of this study was to assess the outcome of infant born on HIV+ mothers enrolled in PMTCT services in all HF of Gicumbi District from January 2012- September 2016.
Method: The study was a retrospective cross sectional study conducted using datasets with the sample size purposively included all 891 of infant born on HIV+ mothers enrolled and followed up in PMTCT services. Dataset review was looked at medical records of all infant born on HIV+ mothers and was analyzed using SPSS version 16.0 software. Descriptive statistics were generated and cross tabulation (Chi-Square test and Fischer's exact test) was done for relationships of variables. Logistic regression was done to assess the effect of various explanatory variables on outcome of infant born on HIV positive mothers and the study logistic regression model was statistically significant all with P-value of < 0.05.
Result: The results showed Prevalence of 1.3; the following factors were more likely associated to the outcome of infant born on HIV positive mothers: Mothers with ART regime (OR=10.244, p=0.010), Pregnancy's term at birth (< 37 weeks of amenorrhea) (OR=19.428, p=0.008), Chlorhexidine disinfection at birth (OR=13.803, p=0.001) and Early beginning of Cotrimoxazole prophylaxis at age of 6 weeks (OR=14.125, p=0.039).
Conclusion: Based on the result of factors noted as associated to HIV prevalence among infant born on HIV Positive mothers were based on Mothers without ART regime, Pregnancy's term at birth (< 37 weeks of amenorrhea) and not take Chlorhexidine disinfection at birth. Information sharing on ART regime and Early beginning of Cotrimoxazole prophylaxis at age of 6 weeks should be strengthened in the health facilities and the community; Mothers should also be taught how is important to take Chlorhexidine disinfection at birth and all women must be taught and linked to ANC for maximizing the ways toward getting the Pregnancy's term at birth (< 37 weeks of amenorrhea).

WEPEA002

Vertical and Horizontal Transmission of HIV among Orphans and Vulnerable Children in Some Selected States of Nigeria

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Background: With the high burden of pediatric HIV and the lack of empirical evidence on the mode of HIV transmission in Nigeria, the Association for Reproductive and Family Health (ARFH), with USAID support is implementing a project to mitigate the impact of HIV on Orphans and Vulnerable Children (OVC) affected/infected by HIV/AIDS in Akwa-Ibom, Lagos and Rivers states, Nigeria.
Methods: The mode of HIV transmission among their OVC was examined. Retrospective study of enrolled OVC in 3 states. HIV OVC having positive mothers were classified as getting HIV through vertical transmission otherwise horizontal. Data summarized by descriptive statistics. Chi-square test determined significance of association between qualitative variables and mode of transmission, Logistic regression analysis was used to identify independent predictors of mode of transmission.
Results: Data on 387 OVC positives showed more males (50.6%) slightly lower females (49.4 %),Slight preponderance of males (50.6%) among 387 OVC HIV positives enrolled. About 42% aged 10 -17 years and 26% < 5 years. Vertical mode of HIV transmission- 77%, higher in children less than < 10 years. Adolescents and OVC from Akwa-ibom more of horizontal transmission. Horizontal transmission highest among Akwa-ibom adolescents. Age and State significantly associated with transmission mode.
Conclusions and recommendations: High proportion of children < 10years infected through vertical transmission. While majority of adolescents by horizontal transmission. Hence, a Swift scale-up of PMTCT services ishighly recommended. HIV pregnant women need close monitoring to receive HIV counseling and testing and get ARV prophylaxis if HIV positive. Improve Behavioral Communication Change(BCC) and introduce condom demonstration into OVC project. OVC programs should include all HIV prevention and control measures used for adults and also ensure the formation of HIV prevention groups in secondary schools.

WEPEA003

Evaluation du Programme d'Élimination de la Transmission Mère Enfant du VIH au Sénégal

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Contexte: The programme of transmission a déprouvé l´enfant du VIH mère (PTME) du Sénégal, en 2005 passé Échelle, était à partir de 2007 à l´aide modifié du niveau des tests Testeoption B + Rapides Santé et Diagnostic Petite Enfance Avec papier on méthodepapier aileron 2011.
Méthodologie: Il s´agit d´une étude détaillée sur les précisions des résultats sur DBS des enfants à partir du-dessus Mères des séropositifs de PEC et Achemine Analyse nationale de facteurs et analyse factorielle Analyse analysée les laboratoires, Analyse de la capitale et analyse des données de Dakar.
Résultats: Du 1er janvier 2016 au 31 décembre 2018, nous avons enregistré 2838, soit 22%, soit 79% avant le dernier jour de leur première année de vie avec 98 résultats revenus 4%.
Sur les 2228 enfants, les 1482 ont été diagnostiqués selon les normes avant-dernier mois de la vie soit de taux de réalisation de 52% et 31% sont soit rendus soit vrais soit de taux de séropositivité de 2%.
Les 2228 résultats de diagnostic précoce annoncés entre 2016 et 2018, la grande majorité 1716, soit 77%, soit complètement incarcérés dans le cadre du PTME (PTME COMPLETE), mère dépistée à temps, couple mère-enfant était sous allaitement maternel protégé.
Les 16% sont des enfants PTME INCOMPLETE (couple mère-enfant); qui est dépistée en fin de grossesse ou au moment de l'accouchement ou de la prophylaxie; de prophylaxie).
Les 4% sont des enfants HORS PTME (couple mère-enfant), et 3% n´ont pas été précisés.
Sur 2228 résultats, 96% sont des revenus négatifs et 98 résultats positifs soit d'un taux de transmission mère-enfant de 4%.
40% de résultats PCR positifs (36/90) sont enregistrés chez les enfants. HORS PTME
Les cas non précisés représentent une proportion de 10%
Les enfants PTME IMCOMPLETE 9%.
Enfin, les enfants PTME COMPLETS représentent 24/1716 soit un pourcentage de 1%.
Conclusion: Les résultats enregistrés entre 2016 et 2018 sont encouragés à rester dans une bonne posture pour la transmission de la mère à l´enfant du VIH d´ici 2020, mais il reste encore beaucoup à faire. des femmes enceintes.

WEPEA004

Missed Opportunities along the PMTCT Cascade in Kenya and Uganda

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Background: A large number of HIV-infected children remain undiagnosed due to missed opportunities along the prevention of mother-to-child HIV transmission cascade.This study addresses some programmatic gaps by describing maternal profiles of children identified as HIV-positive through active case finding in Kenya and Uganda.

Methods: In November 2017-October 2018, caregivers of newly diagnosed HIV-positive children under 15 were enrolled in 45 facilities and communities (Homa Bay County, Kenya: 15, Southwest Uganda: 30). Caregivers were interviewed about mothers' utilization of health services, including antenatal care,HIV testing and antiretroviral. Results were summarized using descriptive statistics.

Results: Median age of all children enrolled (n=174) was 2.4 years (range 0.9-6.2). The median age was was 3.6 (1.4-8.8) years for Kenya and 2.0 years (0.9-4.5) for Uganda. Overall, 51.7% were female. Of 174 caregivers interviewed, 134 (77.0%) were biological mothers and fathers (n=60 in Kenya, n=74 in Uganda). ANC attendance rates were 80.0% and 86.5% in Kenya and Uganda respectively; four known HIV-positive women did not attend ANC. In total, (65.3%) tested HIV-negative in ANC. Of 41 and 56 HIV-positive women during pregnancy and lactating respectively, 41.5% and 26.8% did not receive ARV prophylaxis or treatment. Reasons included clinic not offering ARVs (n=7 during pregnancy, 5 during breastfeeding), defaulting from clinic (n=4,2), home delivery (n=0,3), HIV status denial (n=1,2) and other/unknown reasons (n=5,3).

Of the 41 mothers who were known or tested HIV-positive during pregnancy, had 36.6% of their infants diagnosed by six months of age. 19.5% were not diagnosed until 5-12 years of age. Of the mother-child pairs with complete HIV diagnosis information and maternal diagnosis after delivery, 57.3% children were diagnosed within 14 days of the mother testing HIV-positive; 17.3% were reportedly tested previously. In Kenya, an additional three children were diagnosed before the mother.

Conclusions and recommendations: Findings identify program gaps in which mothers of newly identified HIV-positive children missed PMTCT and this may have delayed diagnosis and treatment of the children. Delays in delivery of HIV testing services to the children were also noted. ANC attendance was slightly lower than national rates and 65.3% of women had tested HIV-negative in ANC and therefore the need to retest during pregnancy and postpartum.

WEPEA006

L´Interaction entre APOBEC3G et le VIH en Afrique

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Issues: Le traitement antirétroviral hautement actif (HAART) a permis aux personnes vivant avec le VIH d'améliorer la durée et la qualité de leur vie. Cependant, la toxicité et l´émergence d´une résistance aux médicaments découlant de l´utilisation de la multi-thérapie sont de plus en plus notées. Par conséquent, de nouveaux médicaments antirétroviraux sont nécessaires, puisqu´il n´existe ni remède ni vaccin contre le VIH. L´interaction virus-hôte s´est avérée importante au cours de la dernière décennie. L´enzyme d´édition de l´ARNm de l´apolipoprotéine B 3G (APOBEC3G), un puissant f acteur de défense de l´hôte contre le VIH, est à l´étude. Cette revue systématique avait pour but de synthétiser les données disponibles sur le rôle des polymorphismes d´APOBEC3G dans l' évolution de l´infection à VIH sur le continent africain.
Descriptions: Il s'est agi d'une revue systématique et trois bases de données ont été consultées pour trouver des publications pertinentes en français et en anglais sur l´association des polymorphismes de l´APOBEC3G avec l´infection à VIH dans les populations africaines. Les termes de recherche étaient "apobec3g" ET "africa" ET "HIV" ; "apobec3g" ET "HIV in Africa" ; "apobec 3g desaminase" ; "hiv" ; "Africa". Deux reviewers indépendants ont évalué les titres, les résumés et le texte intégral des articles sélectionnés.
Lessons learned: Parmi les polymorphismes d'APOBEC3G, le plus étudié était H186R ou rs8177832. La moyenne de la fréquence de l´allèle mineur H186R de l´APOBEC3G disponible pour les études incluses dans notre revue systématique était de 0,29 avec un Intervalle de Confiance à 95 % [0,172 ; 0,401] et variait de 0,108 signalé en Ouganda à 0,47 enregistré au Burkina Faso. Le polymorphisme H186R n´était pas associé à la séropositivité au VIH en Afrique australe. Cependant, l´allèle de référence du H186R protégeait contre l´infection à VIH dans la partie occidentale de l'Afrique centrale , alors qu´en Afrique de l'Ouest, c´était l´allèle mineur du H186R qui protégeait de l'infection à VIH.
Next steps: Les constats de cette revue systématique justifient la nécessité d´accroître la recherche sur *APOBEC3G* et ses variants sur le continent, qui présente une variété importante de sous-types de VIH. Cette recherche aura donc un impact sur la recherche de nouvelles thérapies ne suscitant aucune cytotoxicité et résistance pour les personnes infectées par le VIH.

WEPEA008

CCR2 Polymorphism and HIV: Mutation in Both Mother and Child Is Associated with Higher Transmission

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Background: C-C chemokine receptor type 2 (CCR2) is one of the co-receptors of Human Immunodeficiency Virus (HIV) found on the surface of the target cell. Its genetic polymorphism is among genetic factors known to be associated with HIV infection. Many studies have investigated the association between children's CCR2 polymorphism and HIV infection; overlooking the role of mothers' CCR2 polymorphism. This study aims at investigating the influence of mothers' and children's CCR2 polymorphism on HIV acquisition in children.
Methods: A cross-sectional study was performed in five hospitals in the Northern Region of Cameroon. Blood samples were collected from HIV-infected mothers and their babies infected or not and Deoxyribonucleic Acid (DNA) was extracted from the Buffy coat using the QIAamp®DNA mini kit (Qiagen). The DNA extract was then subjected to Polymerase Chain Reaction (PCR) followed by Restriction Fragment Length Polymorphism (RFLP). Genotype concordance was measured by an overall agreement (%) together with Kappa coefficient. Hardy-Weinberg Equilibrium (HWE) was verified.
Results: A total of 113 HIV-positive mothers, aged 16-43 years, and their 113 children (25 exposed-infected and 88 exposed-un-infected) under 15 years were enrolled in the study. Among these children were 56 girls and 57 boys. The genotypic distribution was in equilibrium with the Hardy-Weinberg Law (X^2=0.3 and p=0.6 in mothers; X^2=2.8 and p=0.10 in children). There was a significant relationship between mothers and children's polymorphisms (p=0.000). There was a concordance of 57.5% between mothers and children genotypes (Kappa= 0.2, p=0.001). Mothers carrying the CCR2-64I allele were 1.2 times more likely to have HIV-infected children compared to those without mutation (OR=1.2, 95%CI=0.5-3.0). Likewise children carrying the mutated phenotypes were 1.4 times more likely to be HIV-infected compared to those without mutation (OR=1.4, 95%CI=0.6-3.5). This risk of infection increased to 2.0 (95%CI= 0.5-8.3) for children whose mothers also carried mutated phenotypes, and decreased to 0.96 (95%CI=0.2-3.8) for those whose mothers carried the wild type phenotype.
Conclusions and Recommendations: The risk of acquiring HIV was higher for children carrying mutation, and increased for children whose mothers also carried the mutated allele. In case of mutant phenotype in mother and child, more attention should be taken during follow-up of exposed children.
Ke**ywords:** CCR2; HIV; mutation

WEPEA009

Surinfections des Ulcérations chez les Patients Infectés par le VIH Associés ou Non à l'Herpès Simplex Virus au CESAC de Bamako et au SMIT du CHU du Point G

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Introduction: Les PVVIH constituent des sujets vulnérables et présentent souvent des ulcérations dues aux herpès virus. On observe souvent des surinfections dues à des agents bactériens et fongiques qui occupent une place non négligeable. Le but de ce travail est de déterminer la fréquence des agents bactériens et fongiques isolés dans les surinfections des ulcérations chez les PVVIH, associés ou non à l'herpès simplex virus dans deux sites de prise en charge de Bamako.
Méthodes: Il s'agissait d'une étude prospective à but descriptif de janvier à août 2018. Les échantillons ont été prélevés sur des lésions ulcératives par écouvillonnage appuyé avec le sigma-virocult® pour la recherche de HSV et sigma-VCM pour la recherche d'agents bactériens et fongiques. L'identification des virus HSV a été faite avec l'instrument LightCycler 480 (Roche®) par la détection simultanée des ADN à HSV-1 et HSV-2 (Kit R-gene HSV-1, HSV-2, VZV, Argène®). Les milieux de cultures ont été ensemencées pour la recherche de bactéries et levures identifiés par tests biochimiques à l'aide de galeries classique, galerie api ou au Vitek-2.
Résultats: Des prélèvements ont été effectués chez 60 patients dont 67% de sexe masculin et 33% de sexe féminin, et la médiane d'âge était de 39 ans [15 ; 62]. Les germes les plus isolés étaient le genre *Klebsiella* 21,56% et *Staphylococcus aureus* (17,64%). D'autres germes ont été identifiés notamment *Cryptococcus laurentii* (3,92%), *Ureaplasma urealyticum* (5,88%). Les cas d'HSV associés à une surinfection étaient 24 (34,8%). Les cas d'HSV non associés à une surinfection étaient 8 (11,6%). Les germes isolés sans infection à HSV étaient 26 cas (37,7%). Aucuns agents pathogènes n'ont été isolé dans 11 cas (15,9%) Les BGN étaient les plus représentés au cours d'infection HSV suivis des *Staphylococcus aureus* ainsi que quelques *Ureaplasma urealyticum*, *Cryptococcus laurentii*, *Kocuria kristinae* et *Streptococcus uberis*.
Conclusions: Cette étude nous a permis de révéler une présence élevée de germes isolés dans les surinfections des ulcérations chez les patients infectés par le VIH associés ou non à l'herpès simplex virus

WEPEA010

Impact of Active Case Finding in TB, HIV and Co-infections Notification amongst Children in High Risk Groups in Zimbabwe

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Background: Notification of HIV and TB in children in Zimbabwe has been below expectations and estimations. Collaborative TB/HIV management and case detections are essential to ensure that HIV positive TB children are identified and treated immediately, appropriately, and to reduce the burden in the world. Another pillar, emphasizes on reliable measurement of progress in reducing HIV and TB incidence, HIV and TB deaths and catastrophic costs are essential and a cross sectional review with the use of program data has been used to measure TB and HIV co-infections in children to inform programming for an in-depth planning on how to end TB and HIV in children Passive case finding has been the main method in childhood TB and HIV detection and as a result low infant diagnosis have been experienced in Zimbabwe. End TB strategy emphasises on active case finding as a key method in early TB and HIV case detection. Zimbabwe Ministry of health rolled out active case finding amongst high risk groups where HIV and TB and screening was done.
Methods: A medical team carried out outreach services to communities in the prioritized districts around Zimbabwe from February 2017 to Dec 2018. The process provided access to free TB Screening and HIV testing to high risk groups including children. Two TB screening tools were used to increase sensitivity and these are the symptom screening and digital chest radiography. Presumptive TB patients had a supervised spot sputum specimen collected and examined at the laboratory by XPERT/RIF machine. All patients due for HIV test were offered a test according to the World Health Organization and national HIV testing guidelines.
Results: 6523 (8.18%) children (0-14 years), were screened for TB and 36.30% (n=2386)were TB presumptive. 4.32% (n=82) were detected with TB and started on appropriate treatment. 3.65% (n=78) were new HIV positive cases. 76.54% (n=62) of the TB diagnosed children were HIV positive and they were all knew HIV cases.386 children were HIV positive prior screening and 95.08% (n=367) were already on ART which is above the 90% target.
Conclusions and Recommendations: HIV positivity and HIV TB co-infection are significantly higher in children (0-14) as compared the general population highlighted by the findings of Zimbabwe TB prevalence survey done in 2014. More collaborative efforts should be put in active case findings of high HIV and TB amongst children.

WEPEA011

Pulmonary Tuberculosis Gene Xpert Technology: Reduction in Missed Tuberculosis Diagnosis in People Living with HIV/AIDS in Federal Medical Centre Owo, Ondo State Nigeria

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Background: Gene Xpert MTB/RIF was introduced and commenced in Federal Medical Centre, Owo, Ondo State Nigeria in 2015. The study aimed to know the impact of Gene Xpert MTB/RIF on diagnosis and laboratory systems strengthening.
Methods: A retrospective review of records of Gene Xpert register was conducted from January 2015 - January 2017. The agreement of Gene Xpert with acid fast bacilli was determined using the sensitivity and positive predictive value of the Gene Xpert test. Associations was assessed using chi square. Binary logistic regression was used to determine the predictors of Gene Xpert result.
Results: A total of 1246 records were reviewed, 264(21.2%) were HIV positive. The average age of respondents was 41.5 ± 1.6 years, 605 (48.6%) of the patients were female. The Gene Xpert detected 90(7.2%) of the 664 cases. Males had a higher number 52(18.2%) of detected Tuberculosis with Gene Xpert compared to the females 36(10.1%) (p=0.002) while the age group of 35-44years had more 27(20.8%) detected Gene Xpert result compared to other age groups (p=0.011). Among cases with smear positive result, 23 (20.5%) of them were living with HIV compared to 154 (29.8%) who were smear negative (p=0.029). The performance of Gene Xpert for the detection of mycobacterium tuberculosis compared to sputum smear microscopy in all the cases showed sensitivity of 87.5%, while sensitivity among HIV positives was 100%. Follow-up as a reason for Gene Xpert investigation had 4 times odds of Xpert MTB/RIF detection compared with initial diagnosis (OR:4.07; CI 95%: 1.15-14.40).
Conclusions: Prompt and early case detection of additional TB was possible. The laboratory system was strengthened to reduce the rate of missed tuberculosis diagnosis especially in people living with HIV/AIDS. There is a need to improve proper documentation of test outcomes and follow up of both presumed and diagnosed tuberculosis.
Keywords: HIV, Gene Xpert MDT/RIF, sputum smear microscopy, mycobacterium tuberculosis

WEPEA012

Prevalence and Distribution of Human Papillomavirus (HPV) Genotypes among HIV Infected Women in Lomé, Togo

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Human papillomavirus (HPV) infection is the most common sexually transmitted disease worldwide, and it particularly affects people living with human immunodeficiency virus (HIV). This study aimed to estimate the prevalence of HPV and to describe HPV genotypes in HIV-1 infected women in Lomé, Togo.
From September 2014 to September 2015, a cross-sectional study was conducted in two treatment and care centers for people living with HIV : the Centre Hospitalier Universitaire Sylvanus Olympio and the non-profit organization 'Espoir Vie Togo'. Women living with HIV-1, aged 18 years and older, receiving a combination. antiretroviral therapy for at least 12 months, and who gave their informed consent to participate in the study were recruited. Cervical swabs were collected using a cytobrush, and cells were stored in a preservative solution. HPV testing was performed using e-BRID equipment. Blood samples were collected for CD4+ count using a flow cytometer and for HIV viral load using polymerase chain reaction.
A total of 221 HIV-1 infected women were enrolled. The prevalence of any type and oncogenic HPV was 22.2%, 95% confidence interval (95% CI) : [17.1-28.2] and 16.7% (95%CI : 12.3-22.3), respectively. The most prevalent genotypes were: 18 (8.6%), 68 (4.1%), and 62/81 (2.7%). Only 1.3% (3/221) of participants were infected with HPV16. In regression analysis, no factor was associated with HRHPV.
This study showed the diversity of circulating HPV genotypes in Togo. Programs of HPV vaccination and early detection of benign or precancerous lesions should be implemented to reduce cancer-related comorbidities.

WEPEA013

Assessing the Prevalence of Communicable Diseases among Opioid Drug Users: A Case Study from Medically Assisted Therapy (MAT) Clinic in Malindi, Kenya

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Background: An estimated 3.8% of all new HIV infections in Kenya occur among people who use drugs (PWUDs). Consequently, several communicable infectious diseases, including HIV/AIDS, Hepatitis-B infection, syphilis, and tuberculosis (TB), are increasing among PWUDs. To curb the AIDS epidemic and reduce the HIV prevalence in Kenya, it is crucial to upscale effective HIV/STI prevention, treatment, care and support targeting key populations. Drug abuse integrated treatment programs such as MAT clinics are ideal sites to identify, initiate and maintain appropriate medical management of these infections.
Methods: The study involved a retrospective data review of clients enrolled in MAT by November 2018 using longitudinal Excel-based attendance, clinical and laboratory registers. Variables analyzed co-morbidities, socio-demographic characteristics and monthly treatment status, and dis-aggregated by gender and age, and analyzed comparatively.
Results: A total of 875 clients (92.7% males) were enrolled in MAT by November 2018, with 80.7% of them aged 25-44years (Median=33yrs). 77.6% were active on MAT (22 prisoners), 13% lost to follow-up, 3.4% voluntarily weaned-off methadone and 2.1% deceased. 95.8% of all enrolled clients were poly-drug users (males=88.4%); 63% (551 clients, males=92.4%) were injecting drug users. 106 clients (12.1%; 71.7% males) were confirmed HIV+, with 82% aged 25-44years (Median=36yrs). 100 HIV+ clients were initiated on ART (94.3%; males=74%), while 4.7% declined treatment. Treatment retention after 42 months stood at 86%. 41 clients (4.7%) screened positive for Hepatitis-C infection with 39% of them completing a 3-month course of treatment with Ledipasvir 90mg+Sofosbuvir 400mg (Harvoni). 19 clients (2.2%; 68.4%=males) were HBV+, whereas 2 clients were HIV/HBV/HCV co-infected. 28 clients (3.2%; 92.9%=males) screened TB-positive with 96.4% of them successfully completing TB treatment.
Conclusions and Recommendations: Prevalence of HIV and other communicable infections such as HBV and TB is significantly higher among PWUDs than in general population, and especially the youth drug abusers. This may be attributable to either direct exposure through needles or increased likelihood of high-risk behavior due to loss of judgment. Substance abuse is therefore of primary concern and thus the need to scale up and strengthen harm reduction models like MAT as an integrated approach to curb this epidemic.

WEPEA014

Incidence of Active Tuberculosis and Risk Factors for HIV Patients Infected with HIV at the Start of Antiretroviral Treatment in Luanda 2016-2017

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Background: In 2017, an estimated 920 000 people living with HIV (PLHIV) have fallen ill with Tuberculosis (TB) worldwide. Angola is one of 20 countries with the highest estimated numbers of incident TB cases among PLHIV. The objective of this study was to assess the incidence and risk factors for active TB among PLHIV that were starting antiretroviral therapy (ART) in a tertiary HIV specialized hospital in Luanda, Angola.
Methods: A cohort study with a 1-year follow-up period was conducted among 267 HIV patients who started ART and who had a negative screening for active TB. The outcome was the development of active TB during the follow-up period. Semi-structured questionnaires and review of clinical files were used for data collection. Significance level was set at $p< 0.05$ for all hypothesis tests. Pearson chi-squared ($\chi 2$) tests, followed by multivariable logistic regression modelling were used to identify factors associated with active TB.
Results: The incidence of active tuberculosis was 12.0% (32 patients out of the 267 followed), from which 75% (24) developed pulmonary tuberculosis. Twenty-one patients were female. Independent associated factors for active TB were: viral load higher than 10,000 copies [OR = 16.8; 95% CI: 1.7-70; $p< 0.001$]; and having less than 2 meals per day [OR = 17.2; 95%: 2.1-40; $p< 0.01$].
Conclusions and Recommendations: The high incidence of tuberculosis in HIV patients makes it urgent to implement strategies that lead to timely identification, treatment, prophylaxis and prevention of TB among HIV patients on ART. Our study reinforces the results of other colleagues that clearly show the urgent need for stringent IPT policy implementation and increased coverage among PLHIV with a negative TB screening.

WEPEA015

Risk Factors for Active Tuberculosis in HIV Patients on Art: Esperança Hospital, Luanda, Angola 2018

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Background: In 2017, an estimated 920 000 people living with HIV (PLHIV) have fallen ill with Tuberculosis (TB) worldwide. Angola is one of 20 countries with the highest estimated numbers of incident TB cases among PLHIV. Isoniazid preventive therapy (IPT) national policy for PLHIV was published in 2018 but with slow implementation. The objective of this study was to assess the incidence and risk factors for active TB among PLHIV on antiretroviral therapy (ART) in a tertiary HIV specialized hospital in Luanda, Angola.
Methods: The sample size of 813 patients was calculated using an estimated prevalence of 10%, 95%CI and 1% precision. A cross-sectional study was conducted at Hospital Esperança between January-December 2018. Cases were defined as PLHIV who developed active TB while on ART. Semi-structured questionnaires and review of clinical files were used for data collection. Significance level was set at $p< 0.05$ for all hypothesis tests. Pearson chi-squared ($\chi 2$) tests, followed by multivariable logistic regression modelling were used to identify factors associated with active TB.
Results: A total of 849 HIV positive study participants were enrolled. Of these, 111(13.1%) were found to have active pulmonary tuberculosis. Independent risk factors for TB were: contact with active TB cases Adjusted OR = 341.40; 95% CI: 60.8 - 1918.6; $p< 0.01$; active tobacco smoking Adjusted OR = 8.1; 95% CI: 1.4-46.1; $p< 0.01$; having a CD4 count below 200 cells/mm3 Adjusted OR = 126.1; 95% CI: 2.9 - 5404.4; $p< 0.01$; immune failure Adjusted OR = 4.1; 95% CI: 1.11-15.1; $p< 0.05$.
Conclusions and Recommendations: Our study is the first in Angola to provide insightful data on active TB infection among PLHIV on ART. The alarmingly high incidence of active TB among PLHIV found in our study clearly shows the urgent need for stringent IPT policy implementation and increased coverage among PLHIV with a negative TB screening.

WEPEA016

Knowledge of Cervical Cancer and Human Papilloma Virus in Bukavu, Democratic Republic of Congo (DRC)

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Issues: Cervical cancer is a serious public health problem and the most frequent cancer of women in the undeveloped counties such as Democratic republic of Congo (DRC). The level of women's awareness about cervical cancer is unknown. Prevention begins with a series of awareness and information campaigns to break the taboo surrounding cervical cancer before making in application a strong health program of fight against cancer in the country . The study purpose was to estimate knowledge on cervical cancer and it causes.
Descriptions: A cross-sectional study was conducted in the Muhanzi market in Bukavu, south-kivu, DRC including 186 women, allsellers in the market. The women were interviewed at their work place using a standardized questionnaire. The women's score were registered from Epi-info7 and statistical analysis were made with IBM SPSS Statistics 20.
Lessons learned: The knowledge rate on cancer in general was 74,2% and the one for cervical cancer 52,2%. In the population of the study 36,6% doesn't know the real cause of cervical cancer: for 19,4% cervical cancer is caused by vaginal wound; 10,8% think it is vaginal infections; 7,5% said witchcraft; 4,3% said sexual relations, 7,5% knows it is by abortion ; 8,6% by hygienic miss; 4,3% by medical mistakes; and 1,1% food with grits . About knowledge on Human Papilloma Virus (HPV) only 5,4% have already heard about HPV and 81,7% don't know anything about the screening. 9,7% in our population have seen bleeding from vaginal cavity away from menstrual period and have never consult for this.and 98% have never been to a hosptal for screening of a cancer.

WEPEA017

Awareness and Case Detection of Hepatitis Co-infection among People Living with HIV and Health Workers in a Nigerian University Teaching Hospital

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Background: Hepatitis B and C co-infection with human immunodeficiency virus (HIV) has is a serious issue especially in low- and middle-income countries. Active surveillance and case detection are crucial strategies towards the effective control of this public health challenge. The main objective of this study is to determine the awareness and case detection of hepatitis co-infection among people living with HIV/AIDS health workers in a Nigerian University Teaching Hospital
Methods: A cross-sectional study was carried out using a structured, self-administered questionnaire to assess the awareness and case detection of hepatitis co-infection among people living with HIV/AIDS and health workers in the Nnamdi Azikiwe University Teaching Hospital Nnewi, Anambra State Nigeria. Data collected were checked for completeness and analyzed using Students t-test and One way ANOVA and p-values less than 0.05 ($p< 0.05$) were accepted as statistically significant. Continuous variables were presented as means and standard deviation while categorical variables were presented as percentage.
Results: All the health workers, (100%) were aware of hepatitisHIV co-infection while only 44% of the patients were aware of of this. Only 30% of the patients knew that unprotected sexual intercourse is one of the modes of transmission of hepatitis. Patients´ age and duration of treatment have no statistical significance with their awareness to HIV/hepatitis co-infection. However, their educational level ($p = 0.001$); occupation ($p = 0.001$) and marital status ($p = 0.01$) were staistically significant on their awareness at 95% confidence interval ($p < 0.05$). Gender of the health workers had no statistical significance with their overall awareness of hepatitis co-infection in HIV, ($p=0.22$). The greatest obstacle towards effective case detection of hepatitis co-infection in people living with HIV among the healthcare workers were the cost of screening test, (mean score = 3.32), lack of awareness (mean scre 3.15) and high workload (3.10). The most action taken by the health workers among co-infected lients was counseling of the patient, (98.75%).
Conclusions and Recommendations: There is poor awareness and route of transmissions of hepatitis among patients included in this study though health workers' awareness is high. There is need to educate the people living with HIV and the general public as a necessary step towards effective control of hepatitis / HIV.

WEPEA018

Co-infection of HIV, Hepatitis B, C and E Viruses among Liver Disease Patients Attending Tertiary Hospitals in Osun State, Nigeria

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Background: Hepatitis B and C viruses cause death due to liver disease worldwide among Human Immunodeficiency Virus (HIV) positive individuals. Hepatitis B (HBV) and HIV have similar routes of transmission primarily; sexual, intravenous injections and prenatal while hepatitis C (HCV) is transmitted mainly through blood transfusion. Human immunodeficiency virus increases the pathological effect of hepatitis viruses and potentiates re-activation of latent hepatitis infections as a result of reduced immunity. The increase in use of antiretroviral (ARVs) drugs has led to longer period for patient survival and apparent increase in liver disease among HIV positive individuals.
Methods: Ethical clearance was obtained and informed consent questionnaire was admitted to liver disease patients to obtain their demographical data. A total of 121 liver diseases blood samples, 60 from OAUTH, Ile-Ife, 58 from LTH, Osogbo and 7 from Wesley hospital, Ilesha was tested for hepatitis B, C, E and HIV viruses using rapid chromatographic test kits and enzyme linked Immunossorbent assay (ELISA). Data was analyzed using packages within SPSS and $P \leq 0.05$ was considered significant.
Results: High prevalence of 32.2%, 0.8%, 10.7% and 18.2% for HBV, HCV, HEV and HIV respectively were found. Risk factors based on marital status of the subjects showed a significant association with occurrence of HEV infection at (χ^2=9.869, P=0.020). The prevalence of HBV, Anti-HCV, HEV and HIV among liver disease patients in Osun state is alarming and health education among the patients and general population is advocated.
Conclusions and Recommendations: Since HEV is associated with unhygienic practice, HIV patients should be enlighten and encouraged to improve their living conditions.

WEPEA019

GeneXpert MTB/RIF for Rapid Diagnosis of Extra-pulmonary Tuberculosis in High HIV and Tuberculosis Burden Settings

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Background: Ethiopia is known to have high prevalence of HIV and tuberculosis. The proportion of extra-pulmonary tuberculosis (EPTB) cases increased to 58% in HIV-infected patients. However, the diagnosis of EPTB remains challenging and EPTB cause excess mortality in people living with HIV. The currently available tools are either low in sensitivity or require longer time to confirm EPTB. We determined the clinical utility of the Xpert MTB/RIF for the diagnosis EPTB in Ethiopia.
Methods: This study was carried out at a public tertiary care hospital in Ethiopia from August 2016 to June 2017. A total of 232 (68 HIV-positive and 164 HIV-negative) patients with clinically presumed of EPTB were included. Site specific extra-pulmonary samples (98 lymph node aspirates, 63 pleural fluids, 38 cerebrospinal fluid and 33 peritoneal fluids) were collected and examined for TB by culture and Xpert MTB/RIF. The diagnostic accuracy of Xpert MTB/RIF was calculated compared to culture and stratified by HIV status and specimen types.
Results: Overall, 98 (42.2%) specimens were positive for *M. tuberculosis* by culture and 103 (44.4%) by Xpert MTB/RIF**.** There was higher proportion of EPTB cases among HIV-infected patients (48.5% versus 39.6%) than HIV-uninfected patients. The sensitivity of Xpert MTB/RIF for EPTB was 88% among HIV-infected patients and 92% among HIV-uninfected patients, with no statistically significant difference between the two groups. However, the Xpert MTB/RIF sensitivity was quite different among the specimen types. Xpert MTB/RIF has highest sensitivity for lymph node TB (91%), modest for TB meningitis (81%) and lowest for pleural (47%) or abdominal TB (43%). A negative Xpert MTB/RIF test on fluid specimens does not exclude the diagnosis of pleural or abdominal TB and patients with a high clinical probability of EPTB should be started on anti-TB treatment. The Xpert MTB/RIF specificity was high (92%) and not significantly affected by HIV-status or specimen types.
Conclusions and Recommendations: Xpert MTB/RIF is likely to be of greatest utility when diagnosing patients suspected of lymph node TB or TB meningitis, even in HIV-infected patients. Xpert MTB/RIF offered a rapid diagnosis and particularly important in life-threatening forms of EPTB among HIV-positive patients.

WEPEA020

The Contribution of Contact Tracing in Tuberculosis (TB) Case Detection in North-Western Nigeria Using Community Based Organizations (CBO)

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Background: The World Health Organization estimates that 10 countries- Nigeria inclusive- account for 64% of the global gap in TB case finding. In this group; Nigeria, India and Indonesia account for half of the total gap.
The major issue with TB in Nigeria is the low case finding for both adults and children.
In 2017 only 104,904 TB cases were detected out of an estimated 407,000 of all TB cases expected to be detected in 2017.This indicates a treatment coverage of just 25.8 per cent and a gap of 302,096 cases .These gaps were either undetected or detected cases that were not notified especially in "non DOTS sites".
Aims/Objectives: To assess the effect of contact tracing on TB case finding at Centre for Integrated Health Programs (CIHP) supported Secondary Health facilities in Kaduna State.
Materials/Methods: From four CIHP funded community based organizations (CBOs) , we reviewed mid-year (Oct 2018-March 2019) activities in eleven secondary health facilities. This review included a check on the level of TB case finding from TB contact tracing. The CBOs got the contacts of index TB clients from the DOTS officers and visited their homes. Immediate household members were screened for TB and presumptives identified were escorted to the facilities where they were evaluated using Genexpert and those diagnosed for TB were placed on TB treatment
Results: A total of 237 index TB clients were identified in the facilities, 272(115%of Index clients) of their immediate household members were traced and screened for TB using a structured checklist. Of this group, 162 (60%) were identified as presumptives while 40(25%) of them were diagnosed for TB.
We observed a significant correlation exists between the number of TB patients screened and the number of presumptive contacts identified (r = 0.982).
However, only a quarter of the presumptives identified were eventually diagnosed with TB, and there was no significant relationship between the presumptive contacts identified and those eventually diagnosed (r = 0.01).
Conclusion & Recommendations: Our study concludes that active contact tracing would improve TB case detection. Also to improve yield, we advise that identified presumptives be escorted to facilities for laboratory investigations. We also recommend that future studies should review the TB checklist, because our study shows a 25% accuracy for the diagnosis of presumptives.

WEPEA021

HIV Case Finding through Community TB Screening

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In 2014, the Joint United Nations Programme on HIV/AIDS (UNAIDS) and partners launched the 90-90-90 targets; the aim was to diagnose 90% of all HIV-positive persons, provide antiretroviral therapy (ART) for 90% of those diagnosed, and achieve viral suppression for 90% of those treated by 2020.
As part of Ghana's HIV/TB country response, efforts are being made to maximise all opportunities to screen the population for HIV and TB. Despite the intricate relationship between HIV and TB, many HIV screening efforts do not integrate TB screening until an HIV case is diagnosed. For TB screening, the situation remains the same or worse. This situation limits the possibility of diagnosing new HIV and TB cases through these screening efforts especially within the community.
The Ghana National TB Voice Network through a TB REACH Wave 6 Grant has been conducting community mobilisation and TB screening activities through activations such as durbars and football galas organized mainly in urban slums. These organised activities draw large crowds of people are educated and screened for TB. As part of contributing to efforts to achieving the 90-90-90 targets, complementary HIV screening was done alongside the TB screening.
Results from community screening activities conducted between January to June 2019 showed that, 26 new cases were detected out of 12,675 screened for TB and out of the 6628 screened for HIV, 58 positive cases were recorded. 52.3% of persons who undertook TB screening declined to take HIV test.
This result suggests that integrating HIV screening in community TB case detection activities could result in the detection of new HIV cases.

WEPEA022

Seroprevalence of Kaposi's Sarcoma-associated Herpesvirus among HIV-infected Individuals in Ogbomoso, Nigeria

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Background: Kaposi sarcoma (KS) as one of the most common cancers in several sub-Saharan African countries where the vast majority of cases of KS occur. It primarily affects human immunodeficiency virus (HIV)-infected adults with advanced immunodeficiency. However, currently, only limited data for Kaposi Sarcoma Human Virus (KSHV) infection among HIV-infected individuals living in this area is available Therefore the study aimed at the detection of human Kaposi sarcoma in HIV infected individuals.
Methods: A cross-sectional study of consented 93 HIV positive participants was conducted in Ogbomoso, from 2018 through 2019. Plasma samples were collected, subjected to CD4+ count and screened for KSHV using indirect enzyme-linked immunosorbent assay (ELISA) was used to analyze the existence of KSHV-IgG.
Results: The overall prevalence of Kaposi sarcoma was 45.2%. The highest seroprevalence was observed in the age range 41 - 50 years (40.50%), female (73.80%) and CD4+ count of 201 - 400 (40.50%). There was a statistically significant difference in the CD4+ count (ρ=0.047).
Conclusions and Recommendations: The findings from this study support the presence of antibody specific for the infection by KSHV. Thus management of HIV infected individuals should consider the future risks of KS associated malignancies.

WEPEA023

Risky Behavior and HIV/HCV Knowledge of Women Commercial Sex Workers (WCSWs) and Injecting Drug Users (IDUs) in Rajshahi City of Bangladesh

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Background: The rate of co-infection of hepatitis viruses with human immunodeficiency virus, though still controversial, is becoming a growing global health concern, principally because each infection affects the course of the other and increased risk of acquiring the human immunodeficiency virus (HIV) and the hepatitis C virus (HCV) due to prevalent engagement in drug use and sexual behaviors. No research has investigated HIV and HCV knowledge in this high-risk population. We investigated the rate of co-infection of these two viral diseases in Rajshahi city of Bangladesh.
Methods: The present study evaluated a sample of adult floating women commercial sex workers and injecting drug users/injectors from Rajshahi city (n = 290) who were recruited from streets & parks. Their hepatitis C status was determined using commercially acquired reagent strips.
Results: The sample had low HIV and HCV knowledge but also reported fewer risk behaviors including 64% engaging in sex work and 80% reporting a history of drug injection. The results of multiple regression analysis for risky sexual behavior indicated that sexual minority women and those with less HIV knowledge were more likely to engage in high-risk sexual behaviors. The regression model identifying the significant correlates of risky drug behavior indicated that HIV knowledge, age, and income were negative correlates and that sexual minority women were more likely to engage in high-risk drug use.
Conclusions and Recommendations: Bangladesh must act rapidly and decisively to avert the impending HIV/HCV epidemic or it will be too late. Interventions for women CSWs and IDUs should consider the varied impact of sociodemographic background and prioritize HIV/HCV education to more effectively deter risky sexual and drug behaviors.

WEPEA024

HIV and HCV Co-Infection among Female Injecting Drug Users in Kathmandu, Nepal

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Background: Female Injecting Drug Users, who are among the hidden affected populations, are more prone to HIV due to their risky injecting behaviors, unprotected sex and sex selling practices. HCV and HIV co-infection is associated with accelerated hepatic fibrosis progression and higher rates of liver decompensation and death compared to HCV monoinfection. This study explored the prevalence and correlates of HIV and HCV co-infection.
Methods: The data for this study was taken from first round of integrated biological and behavior survey (IBBS) among Female Injecting Drug Users (FIDU) in Kathmandu Valley in 2016. IBBS surveys are taken as the effective second generation surveillance tools to generate evidence-based data. The Network Sampling was used in this survey to recruit 160 sample needed for this survey. Network Sampling is a probability sampling generally used in sample surveys among rare population.
Results: More than a fifth (21%) FIDUs were adolescents less than 20 years with mean age 24.4 years. More than a third had basic education (34%). More than a tenth got divorced/separated. Almost two third lived in a rented house. More than a fifth (23%) consumed alcohol every day. Almost two in five (38%) had ever been imprisoned. More than a third (34%) FIDU were injecting drugs for more than 5 years. Similarly, more than three fifths FIDUs' (61%) male partner also injected drugs.
Almost a fifth FIDU (17%) also had sex in exchange for money in the last 12 months. More than one in five FIDU (22%) had HCV while almost one in ten (9.2%) had HIV. Out of all FIDU, 5.7% had both HIV and HCV. HIV co-infection was high among those who were illiterate (14%), who had got divorced/separated (18%), who had taken drug since more than 5 years (13%), who were ever been prisoned (8%), who had sex for money (8%) and who did not use condom at last sex (11%).
Conclusions and Recommendations: Prevalence of HIV, HCV and co-infection among FIDU is high in Kathmandu. A higher proportion of FIDU who were Illiterate, divorced/separated, who had long injecting history, who had sex in exchange for money and who did not use condom at last sex had higher rate of co-infection. Hence, interventions should be focused on these female injecting drug users who have higher co-infection rate.

WEPEA025

Divergent Major Capsid L1 Gene of HPV-35 in HIV-infected Men who Have Sex with Men in Central Africa

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Background: HPV-35 is one of the major oncogenic HPV variants circulating in Central Africa. We herein evaluated the genetic diversity of HPV-35 specimens isolated from Central African Bantu populations.
Methods: Cervicovaginal swabs obtained from Central African women, and anal swab from Central African men who have sex with men (MSM) were included. Swabs positive for HPV-35 where subjected to sequencing of the L1 gene and the LCR region for phylogenetical analysis.
Results: Overall, wide range of HPV-35 L1 and LCR variants were found to be phylogenetically close to the reference genotype "HPV-35H". Interestingly, HPV-35 from HIV-infected Central African MSM (#CAR5) showed 2.3% difference within L1 gene compared to reference sequence, indicating significant divergent variant which could constitute a new variant *per se*. The HPV-35 variant from #CAR5 also harbored a 16bp insertion in the LCR region. Finally, phylogenetic analysis revealed geographical and anatomical specificities in the distribution of classical and new HPV variants.
Conclusions and Recommendations: HPV-35 specimens circulating in Central African Bantu populations studied are highly conserved. However, our observations suggest the adaptation of atypical HPV-35 variants in the MSM population living in the Central African Republic, with possible emergence of yet unknown HPV subtype close to HPV-35 but varying significantly from the HPV-35H reference genotype. Divergent HPV-35 variant likely circulate in the high-risk population of MSM, and particularly in HIV-infected MSM living in Central Africa. Taken together, these features should be taken into account to evaluate the effectiveness of the prophylactic Gardasil-9® vaccine in populations at risk for HIV and oncogenic HPV acquisition living in Central Africa, especially the vulnerable group of MSM.
Keywords: Oncogenic HPV; HPV-35; New HPV subtype; Men who have sex with men; Gardasil-9; Central Africa

WEPEA026

Epidemiological Profile of Tuberculosis and HIV Coinfection in Kara Health Region, Togo, 2008-2017

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Background: In low income countries, TB/HIV coinfection is still a great burden to healthcare systems, and trying to overcome it, highly depend on the quality of available data sources. In Togo, only few monocentric studies data are available on this issue. We aim to describe TB/HIV coinfection cases sociodemographic, clinical characteristics and treatment outcome in Kara health region from 2008 to 2017.

Methods: A descriptive study based on medical records of all TB cases registered from January 2008 to December 2017 in the seven Centers of Diagnosis and Treatment of Kara Health region was conducted. TB registers were reviewed to extract data that were reported on a questionnaire. TB/HIV coinfection cases were any TB cases with positive serology of HIV. Data collected were processed and analyzed with epi info 7; proportions, means, Adjusted Odds Ratio (AOR), p-value, were calculated, and logistic regression was performed using 95% Confidence Interval (CI).

Results: Mean age in TB/HIV coinfected was 34.71 years ± 10.62, with 1.85 female to male sex ratio and 41.51% of cases living in rural area. Overall prevalence of TB/HIV coinfection cases was 22.14% (371/1676) and HIV screening rate was 84.90% that varied from 46.55% in 2008 to 100% in 2017 (p=0.00). Smear Positive Tuberculosis (SPT+) in coinfected cases represented 77.90%, therapeutic success rate was 50.94% varying from 55.00% in 2008 to 48.39% in 2017 (p=0.58); fatality rate was 24.53% with 30.00% in 2008 and 9.68% in 2017 (p=0.045). About 9.79% (23/235) of cases checked at 2nd month of treatement were still positive to Acid Fast Bacilli count control.

Factors independently associated to positive sputum control at 2nd month of treatment was living in rural area (AOR=2.71, 95% CI [1.09-6.71]); those associated to deaths were not being on antiretroviral therapy (AOR=44.26, 95% CI [17.93-109.28]) and being under cotrimoxazole prophylaxis (AOR=4.23, 95% CI [1.57-11.39]).

Conclusions and Recommendations: Prevalence of TB/HIV coinfection was high in ten years; being on antiretroviral therapy (ART) and cotrimoxazole prophylaxis, have prevent from deaths. Adherence to ART by therapeutic education have to be reinforced and TB/HIV treatment delivery in rural areas should be strengthened trying community based healthcare delivery approaches

Keywords: Tuberculosis-HIV-Coinfection-Kara Health Region-Togo

WEPEA027

Prevalence and Factors Associated with Self-reported STIs among HIV-positive Individuals Aged 15-49 Years in Rwanda

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Background: Data show a strong association between Sexually Transmitted Infections (STIs) and human immunodeficiency virus (HIV), with co-infection accelerating the progression of HIV and increasing the risk of HIV transmission. We conducted this study to determine the prevalence of and factors associated with STIs among HIV-positive individuals in Rwanda.
Methods: Our study was a secondary analysis of data from the Rwanda Demographic and Health Survey (RDHS) conducted in 2014-15. We conducted bivariate and multivariate analyses to identify potential associations between sociodemographic factors and STIs among the 380 HIV-infected people aged 15-49 that were identified during the RDHS. An STI was defined as any self-reported STI, genital discharge, or genital sores within the previous 12 months.
Results: Of the 380 HIV-positive respondents, 255 (67%) were female. The mean age was 34.6 years (±8.8). Sexually Transmitted Infections were reported by 73 HIV-positive individuals (prevalence of 19.2%, 95%Confidence Interval {CI}= 15.5-23.5). Multivariate analysis showed that being from Eastern province (Adjusted Odds Ratio {AOR}=3.56, 95% CI=1.47-8.64) and high risk partnership (non-cohabiting and non-marital) (AOR=3.67, 95CI=1.31-10.24]) were significantly associated with STIs, while secondary school attainment (AOR=0.21, 95% CI=0.06-0.80) and > 18 years (AOR= 0.32, 95% CI=0.17-0.64) were protective.
Conclusions and Recommendations: Co-infection with an STI is very common among individuals infected with HIV in Rwanda. Strengthening education on safe sex especially correct condom use, and delaying age at sexual initiation are important to reduce co-infection with STIs among HIV-positive individuals in Rwanda.

WEPEA029

Comparison of Diagnostic Performance of Smear Microscopy, MTB/RIF Xpert and Chest Radiography among Possible TB Patients with and without a Prior History of TB

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Background: Patients with history of TB are at risk for developing recurrent or drug resistant TB disease thus understanding TB diagnostic tests performance among previously treated TB patients is key to their management and to achieving accurate diagnosis. This study compared performance of MTB/RIF Xpert, Smear Microscopy and chest radiography (CXR) among presumptive previously treated TB patients to patients with no history TB treatment.
Methods: We performed a retrospective crossectional data review among patients enrolled as TB presumptive patients for the Mulago Inpatient Noninvasive Diagnosis of Pneumonia study at Mulago National Referral Hospital. Patient sputum samples were tested for TB using LED fluorescent smear microscopy and MTB/RIF for smear-negative patients. Patients underwent CXR which was read using a standardized interpretation form and interpreted by a trained pulmonologist blinded to clinical information and TB status. Using STATA12 Sensitivity (Sn), Specificity (Sp), for each diagnostic test was calculated in reference to a gold standard of Lowenstein-Jensen (LJ) sputum culture.
Results: A total of 2058 presumptive TB patients, 1070(52.0%) men and 1297(63.0%) with HIV+, were included in the study with mean age of 37yrs SD +/-12.4yrs. Of the 2058 patients, 838 (40.0%) were bacteriologic-ally diagnosed with TB using either smear microscopy(253) or MTB/RIF Xpert (585). One hundred ninety nine 199(69% HIV+) patients had history of previous TB treatment. Sensitivity of previously treated TB patients Vs those with no history of TB treatment for MTB/RIF Xpert was 59.0. % Vs 63.4% (P= 0.7), for Smear Microscopy was 65.0% Vs 56.0% (P =0.2) and for CXR was 44.0% Vs 47.0% (P=0.8). Specificity of previously treated TB patients Vs those with no history of TB treatment for MTB/RIF Xpert was 94.1%Vs 94.4(P=:0.9), for Smear Microscopy was 98.0% Vs 94.5% (P=0.07), and for CXR was 54.0%Vs 73.0% (P=0.005)
Conclusions and Recommendations: There is generally no significant difference in sensitivity between previously treated and those with no history TB treatment among all tests. Specificity of CXR was however significantly lower among patients with history of TB treatment compared to those with no history TB treatment.TB diagnostic decisions based of CXR in patients with history of TB treatment should be done with caution.

WEPEA030

Prevalence and Risk Factors Associated with HIV and Syphilis Co-infection in an African Cohort

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Background: Syphilis has declined in Africa, however, rates remain elevated and are among the highest reported globally. Updated epidemiologic data on HIV and syphilis co-infection is lacking and needed to guide recommendations. AFRICOS is a multi-site cohort of African adults (including people living with HIV, PLWH) which captures longitudinal data in 4 African countries. We provide updated epidemiologic data and describe significant risk factors for PLWH and syphilis co-infection in the populations studied.
Methods: The ongoing African Cohort Study (AFRICOS) has enrolled adults (including PLWH) at 12 sites in Uganda, Kenya, Tanzania, and Nigeria since 2013. Clinical exam, as well as demographic, behavioral, and laboratory (including HIV-specific) information is collected every 6 months. In this evaluation, participants with a positive syphilis screening test on enrollment were included and univariate analysis (chi-square, t-test) were performed to assess risk factors.
Results: A total of 3452 participants (580 HIV-uninfected, 2872 HIV-infected) were included and of those with HIV, 319 (11.4%) had a positive baseline syphilis test. Among PLWH with positive syphilis screen, 182 (57.1%) were women and mean age was 39.9 years (IQR [33.1-47.0]). In PLWH, prevalence of syphilis was highest in Tanzania (47%) compared to Kenya (22.9%), Uganda (11.3%) or Nigeria (18.8%) ($p < 0.0001$). Compared to those screening negative for syphilis, PLWH with a positive screen had a lower mean enrollment CD4 count (391.5 vs 426.0, $p < 0.0001$) cells/uL and higher viral load (VL) (82382.6 vs 73801.8, $p < 0.0001$) copies/mL. Most PLWH and positive syphilis screen had either completed some (or all) primary school education (51.7%) compared to secondary (27.6%), post-secondary (14.4%), no schooling (5%), or vocational training (0.63%) ($p < 0.0001$). In PLWH, participants who consumed alcohol had higher a prevalence of syphilis screen positivity (29.8% vs 17.9%, $p < 0.0001$) and cigarette smoking (7.2% vs 4.5%, $p = 0.0315$).
Conclusion: In this well-characterized cohort of PLWH in Africa, 11.4% of individuals screened positive for syphilis. Screen-positive PLWH had lower enrollment CD4 counts and higher VL compared to screen-negative participants, suggesting benefits of antiretroviral therapy (ART). In PLWH, participants who consumed alcohol and smoked had higher rates of syphilis screen positivity and future studies should investigate other behavioral risk factors associated with syphilis.

WEPEA031

Incidences of Adverse Drug Reactions (ADRs) in the Treatment of Drug Resistant Tuberculosis and HIV (DRTB/HIV) Co-infected Patients in Nigeria

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Background: WHO recommends the initiation of highly active antiretroviral therapy (HAART) between 2 and 8 weeks after the initiation of tuberculosis (TB) treatment for severely immunosuppressed co-infected adolescents and adults. Aside challenges linked to delayed diagnosis of drug-resistant tuberculosis (DRTB) in HIV co-infected patient along with high pill burden and inadequate infection control modalities, the cumulative toxicities of second line TB regimens and HAART remains a distinct obstacle faced by these patients. The cumulative toxicities give rise to adverse drug reactions, resulting in poor treatment outcomes further compromising the global TB/HIV control and health systems performance in developing countries. We assessed the incidences of adverse drug reactions (ADRs) associated with DRTB/HIV treatment at the Government Chest Hospital of Jericho, in Ibadan (Nigeria).
Methods: We retrospectively collected, validated and analyzed treatment data of DR TB/HIV co-infected patients receiving W.H.O. standardized *shorter treatment regimen* (Kanamycin, Moxifloxacin, Clofazimine, Protionamide, Pyrazinamide, Ethambutol and high dose Isoniazid), between June 2017 and December 2018. Summary statistics were used to describe ADRs incidence.
Results: We included in the analysis a total of 40 DRTB/HIV co-infected patients treated at the site. There were relatively more men in the cohort [men, n. 23 (58%)]. The median age and the body mass index (BMI) were 33.5 years (IQR =15.50; range: 20-71) and 17.64 kg/m^2 (IQR =5.60; range: 10.65- 29.75), respectively. Seventy five percent of the participants (n. 30) experienced a median of 3 ADRs (IQR = 5; range: 0-18) with a median onset time of 41 days (IQR= 60.5; range: 1-221) of the second line drugs. The most frequently detected ADR was electrolyte imbalance (hypokalemia) in 47 episodes (28.5%), followed by gastrointestinal symptoms (n. 30 episodes, 18.2%) and neurological disorders (peripheral neuropathy, in 29 episodes (17.9%)). Six patients died from acute renal failure or cardiac complications associated with ADRs.
Conclusions and Recommendations: Patients treated for DRTB/HIV co-infection in our setting tended to experience a wide range of ADRs. Active drug safety monitoring and prompt management of ADRs should be strengthening in our health facility.

THPEA001

Identification Moleculaire et Prevalence des Genotypes HPV chez les Femmes PVVIH au Sénégal

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Contexte: Le papillomavirus humain (HPV) est l'infection virale la plus courante des muqueuses génitales; environ 80 % des personnes sexuellement actives seront infectées à un moment de leur vie. Les infections aux HPV peuvent être facilitées par la co-infection avec le VIH du fait de la dimunition de leur clairance . HPV est responsable des lésions précancéreuses qui peuvent évoluer vers le cancer du col. Ce dernier est la deuxième cause de décès par cancer chez les femmes âgées de 15-44 ans au Senegal.
Objectif: L'objectif de notre étude est d'identifier les génotypes HPV par méthode moléculaire et d'évaluer leur prévalence de HPV chez les femmes PVVIH suivis à l'Hôpital Militaire de Ouakam.
Matériels et méthodes: L'étude s'est faite sur 133 femmes PVVIH sexuellement actives. L'extraction d'ADN des échantillons endocervicaux conservées dans les tubes Abbott Cervi-Collect Specimen Collection Kita été faite avec QIAamp® DNA Mini Kit de QIAGEN. L'identification moléculaire de 28 génotypes de HPV (19 haut risque, HR et 9 bas risque, LR) à été faite par PCR multiplex, kit Anyplex™ II HPV 28 Detection de SEEGEN sur CFX96 ™ de Bio-Rad. Les données ont été receuillis dans excell et analysé par khi-2 de R 3.6.0
Résultats: La prévalence des HPV était de **78.95 %** (105/133), celle des HPV-HR **72.18%**avec **HPV 56**(**46.62%**) majoritaire. Celle des HPV-LR était de **57.14%**avec **HPV42**(**31.8%)**majoritaire.Un taux de co-infection de **62.48%** a été detcté. HPV 16 et 18 ont eu respectivement une prevalence de **20.30%**et **8.27%,** cependant les types 11, 26 et 69 n'ont pas été détecté.
Les facteurs tels que l'âge, la situation matrimoniale, le nombre de grossesse, le nombre d'avortement, le nombre d'accouchement, la contraception et le traitement des femmes ne sont pas corrélés à l'infection HPV dans notre population d'étude (P> 0.05)
Les patientes à charge virale détectableavait une prévalence (84.2%) plus élevée que celles qui étaient indétectables (75.6%) (P=0.53). Selon le taux de CD4, celles qui avaient des CD4< 350 étaient plus infectées par HPV (90.9 %)que celles à CD4>500 (76%) (P=0.26).
Conclusion: Nos résultats montrentdes prévalences HPV élévées chez les femmes VIH+ et ce statut séropositive est dominant par rapport aux facteurs de risque habituels dans la population générale.Un taux significatif a été décélé pour HV16 et 18, ceci appelle une attention particulière dans le suivi des PVVIH.

THPEA002

Contribution of People Living with HIV (PLHIV) in the Management of HIV-TB in Rwanda trough Tuberculosis Screening

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Issues:Tuberculosis (TB) and HIV are the two leading causes of death from infectious diseases worldwide, and are often co-existing. the current Tuberculosis(TB) guidelines for screening TB among high risk groups that include PLHIV. Rwanda Network of PLHIV(RRP+) committed to strengthen the screening among PLHIV in Kigali and West province.
Descriptions: In response to TB/HIV collaborative activities among PLHIV and in accordance with TB screening among high risk groups, a TB screening campaign using Mobile X-Ray machine was conducted. At the screening site the Peer educators' role was to provide numbers to beneficiaries according to their arrival and check the TRACnet numbers to be sure if they are enrolled in HIV care &Treatment. Different communication strategies were applied during preparations and implementation of the campaign. Mixed communication channels were used mainly written invitations, Meetings, Radio advert and Communiqués through churches and Door to door.
Lessons learned: The outcome of the campaign interesting. Among the 2876 people targeted during the screening campaign in Kigali, 2009 (69.8 %) were screened, among them 181(9%) were presumed to have TB. Of 181 with TB presumptive, 15(8.2%) were confirmed TB using GeneXpert while one case was detected with TB Multi Resistant. Among the 3350 people targeted during the screening campaign in Western province in Nyamashe, Rusizi and Rubavu 2730 (81.4 %) were screened, among them 198 (7.2%) were presumed to have TB. Of 198 with TB presumptive, 6 cases (3.8%) were confirmed TB using GeneXpert. TB screening campaign had a set of successes has been noticed including the successful fund mobilization for the screening, high commitment of all stakeholders, local leaders, health facilities and peer educators (PE), high attendance of PLHIV at the screening (76% overall) and expected beneficiaries in Western province attended more (81.4%) compared to Kigali city (69.8%).
Next steps: From the experience of the TB screening campaign among PLHIV, there is need to extending TB screening among PLHIV using X-Ray machine in other provinces and districts in the future by considering all HFs in the catchment area, ensure there are clear Standards Operating Procedures(SOP) for all screening sites, make a close follow-up of the confirmed TB cases during the campaign to ensure they have been treated and cured. It is worth to consider family members TB screening for those confirmed TB+ during the screening campaign.

THPEA003

Missed Opportunities for TB Diagnostic Testing among PLHIV with TB Symptoms in Zimbabwe

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Background: TB is the leading cause of death among People living with HIV (PLHIV). In Zimababwe, gaps in the in the continuum of TB care among PLHIV have not been quantified and characterized. Using data from the Zimbabwe population-based HIV Impact Assessment survey (ZIMPHIA, 2015-2016), we examined the TB care cascade and factors associated with not receiving a TB diagnostic testing among adult PLHIV with TB symptoms.

Methods: The components of the TB care cascade were having any TB symptoms (cough, fever, night sweats or weight loss), receiving a TB diagnostic testing (a chest x-ray or sputum test), being diagnosed with TB and receiving TB treatment. All cascade variables were restricted to the 12 months preceding the interview and limited to adult PLHIV in HIV care. Associations between not receiving a TB testing and sociodemographic, behavioral and biological covariates were assessed using crude odd ratios (cOR) in bivariate analysis and adjusted odd ratios (aOR) in multiple variable logistic regression. Important covariates with significant reduction in -2 log likelihoods in bivariate analysis were added to the regression model in the order. The model was later stratified by an effect modifier, sex. All analyses accounted for multistage survey design.

Results: Of 3507 PLHIV in HIV care, 63.6% lived in rural areas and 51.4% were not screened for TB at their last HIV care visit. In the previous 12 months, 26.0% of PLHIV in HIV care reported having TB symptoms and of those, 37.8% received a TB diagnostic testing. Of PLHIV testing for TB, 49.5% were diagnosed with TB; 90.3% of those diagnosed with TB received TB treatment. In the multiple variable regression model including rural/urban residence, IPT use, Septrin intake and CD4 counts, CD4 counts >500 cells/µl was associated among women (aOR: 2.22, 95% CI: 1.08-4.56). No significant association was found among men.

Conclusions and Recommendations: We found the high uptake of treatment and low uptake of TB testing in Zimbabwe's TB care cascade among PLHIV with TB symptoms. The low screening observed may be a bottleneck in utilization of TB testing. Women with low CD4 counts were more likely to receive a TB testing than their counterparts. Future interventions should maximize opportunities to ensure every PLHIV is screened for TB at each HIV care visit and presumptive cases being linked to testing and treatment.

THPEA004

Improving TB Case Detection and Outcomes in Humanitarian Settings - A Case of Adjumani Settlement in Uganda

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Issues: Uganda is home to over 1.2 million refugees, majority (64.4%) from South Sudan, Democratic Republic of Congo (27.3%), Burundi (3.1%), Somalia (2.4%) and others (2.6%) all settled within 13 settlements, Adjumani Inclusive. Tuberculosis (TB) is a major cause of morbidity and mortality among people living with HIV (PLHIV). Of the 258 PLHIV in 2017, 44(17%) were co-infected with TB while in 2018 out of the 367 PLHIV, 90(25%) were co-infected with TB indicting an increasing burden of TB among PLHIV in the settlements of Adjumani .The end TB strategy 2035 aims at reduction in the number of deaths by 95%, TB incident rate by 90% and catastrophic cost to TB affected families to 0%.This requires accelerated case detection rate among PLHIV

Description: Faced with increasing cases of TB in the settlements, strategies were developed to increase case detection including; health education and TB screening at all service points, conducting integrated outreaches and active community TB screening using Village Health Teams (VHTs). TB active search groups were formed in the community with monthly review meetings and contact tracing for confirmed smear positive TB patients and MDR TB patients. Diagnostic capacity was strengthened by procurement of two (2) additional Genexpert machines prepositioned within in the catchment of the refugee serving health facilities. Two additional health facilities were accredited to provide TB services increasing the number from 5 (2017) to 7(2018), quality improvement was also institutionalized. TB case detection rates increased from 154/100,000 in 2017 to 179/100,000 in 2018, the detection of drug resistant TB from 3 in 2017 to 6 in 2018 and 8.3% of notified cases of children in 2018 from 7.8% in 2017. The treatment success rate improved from 79% in 2017 to 87% in 2018. Major challenges noted were long distances to the MDR TB treatment centers at regional referral health facilities, sub-optimal adherence to TB medication due to cross border movements. These were addressed through adopting community model of directly observed therapy, training health workers on basic management of TB and MDR cases at settlement after completing intensive initial phase of hospitalization.Ambulance deployed and cross border meeting conducted.

Lessons learned: To improve TB outcomes in Humanitarian settings, community engagement in sensitization, case detection, contact tracing and follow up of patients on treatment for C-DOTS is critical.

THPEA005

Improving Cervical Cancer Screening through Visual Inspection with Acetic Acid (VIA) among HIV-positive Women in a Select Health Facility in Eswatini

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Issues: Women living with HIV should be screened annually to reduce risk of developing advanced-stage cervical cancer, a top cause of death among HIV-positive women. Cervical cancer screening among women with HIV is very low in Eswatini (15%). In one high-volume facility of Eswatini, none of the 287 women active on ART in March 2017 were screened for cervical cancer - though screening can be easily provided through visual inspection with acetic acid (VIA) testing (acetic acid is placed on cervix, identifying precancerous lesions to the naked eye). Staff from the USAID-funded AIDSFree project mentored this clinic to implement a quality improvement project (QIP) to address this gap.

Descriptions: With support from AIDSFree clinical mentors, the health facility set up a multi-disciplinary QI committee and reviewed data for gaps and root causes using a *fishbone diagram* and the *Five Whys* methodology. The main root causes included: limited knowledge and capacity of health care workers (HCW) to perform VIA, incomplete data in registers, high number of eligible patients daily, booking too many clients on specific days, recurring stock-outs of VIA screening supplies, lack of a cryotherapy machine, and lack of appropriate registers to document VIA screening. AIDSFree clinical mentors educated HCW on performing cervical cancer screening and gave HCW talking points to use with clients during counselling sessions. Posters on screening for cervical cancer and VIA were placed in the community and the facility to inform/mobilize women. A registration tool was developed to capture information on clients screened for cervical cancer. An agreement was also made with a regional hospital to offer cryotherapy to treat pre-cancerous lesions in patients who screened VIA positive. HCW met monthly to track performance, modify improvement strategies, and document QIP progress.

Lessons learned: Screening rates improved from 0% to 81% (n=232) within the 6 months of QIP implementation (Apr-Dec 2017). All 27 women (11.6%) who screened positive through VIA were referred for cryotherapy services, of which 25 successfully received cryotherapy and 2 received total abdominal hysterectomies.

Next steps: This project improved cervical cancer screening among ART-enrolled women in a high-yield area and improved access to cryotherapy. VIA is being scaled up to all AIDSFree-supported sites. The QIP will be developed into a change package to share with the MOH's National AIDS Program in Eswatini.

THPEA006

Anogenital Cancer Burden and Associated High-risk Human Papillomavirus Diversity Patients in Botswana: Implications for Vaccine Strategy

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Background: Human papillomaviruses are sexually transmitted and high-risk types, are associated with anogenital carcinoma and its precursor lesions.Studies indicate that genotypes 16 and 18 are the most common in high-income countries. In Botswana, HPV-associated cancers are increasing in HIV infection. The aim of the study was to determine distribution of high-risk HPV types in patients with anogenital malignancies in order to inform vaccine strategy as a preventive measure.
Methods: A retrospective cross-sectional study design using 258 (126 anogenital and 162 cervical) archived formalin-fixed and paraffin-embedded tissues collected between 2006-2016, from National Health Laboratory was used. Tissue sections of 20µm were cut, de-waxed with xylene, re-hydrated with degraded alcohols and digested with proteinase-K before DNA extraction and amplification. Human papillomavirus 16, 18, or other high-risk (HR) types was detected using Abbott m2000 real-time PCR platform. Tissues with other high-risk types were subsequently analysed using an in-house multiplex qPCR assay that includes 15 validated fluorophore probes.
Results: In anogenital tissues (anal, vulvar & penile sites) 68/126 (54%) had hrHPV; 69% had HPV16 only, 28% had other hrHPV types and 2.9% were co-infected with HPV 16 and other HR types. Human papillomavirus type 18 was not detected in this cohort. In cervical tissues, 132/162 (82%) had hrHPV; Other hrHPV genotypes were most common in this cohort at 56.1%, HPV16 at 50% and HPV18 at 15.2%. Other hrHPV types were most common in precursor lesions than carcinomas, while HPV16 was more common in carcinomas than other hrHPV genotypes. Higher prevalence of hrHPV was observed in HIV/hrHPV co-infection. In both cohorts, only HPV16 was detected in specimens from HIV-negative individuals. Other high-risk types detected in the study included HPV 26, 31, 33, 35, 39, 45, 51, 52, 66 and 68.
Conclusions and Recommendations: Anogenital malignancies were associated with HPV16 and other hrHPVs in our study. Other hrHPVs were more common in pre-cancer whereas HPV16 was more common in cancer than other hrHPV genotypes. HPV18 was isolated only in cervical tissues. These findings suggest that multivalent HPV vaccines may be more suitable in this setting.

THPEA007

Evaluation of Markers of Clinical Improvement among HIV Infected Adults Treated for Tuberculosis in Jos, North Central Nigeria: A Retrospective Cohort Study

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Background: Clinical improvement monitoring remains an important determinant of tuberculosis (TB) treatment outcome especially among TB/HIV co-infected adults due to high morbidity and mortality rates associated with these infections. We determined the proportion of patients who demonstrated significant clinical improvement after completing TB chemotherapy, as well as predictors of treatment outcome.

Methods: We retrospectively evaluated data of 612 HIV^+ patients aged $\geq$ 18 years co-infected with TB who were enrolled for treatment between January 2009 and December 2013 at the HIV Clinic of Jos University Teaching Hospital, Jos, Nigeria. TB was defined as sputum positive by smear microscopy, Chest X-ray suggestive of PTB, and clinician diagnosed TB (clinical diagnosis). Patients diagnosed with TB were initiated on TB chemotherapy and followed-up for 8 months. Logistic regression was done to determine factors associated with treatment outcome.

Results: The median (IQR) age was 35 (30, 41) years and 64.5% were female. 85.1% (521) completed treatment. 9.5% (58) died, 25 (4.1%) patients defaulted and 1.3% (8) transferred out. 94.6% (493) of those who completed treatment achieved cure. Median baseline Log viral load of the cured group significantly declined from 4.20 (2.30, 5.01) to 2.30 (2.30, 3.00) ($p< 0.001$). Similarly, median baseline BMI and CD4+ cell count increased from 19.68 (17.50, 22.50) kg/m^2 to 21.83 (19.42, 24.17) kg/m^2 ($p< 0.001$), and 161.0 (78.0, 321.0) to 253.00 (116.5, 406.5) $cell/mm^3$ ($p< 0.001$) respectively. However, in the failed treatment group, there was no significant difference between the pre- and post-treatment median levels of BMI, CD4+ cell count and viral load ($p>0.05$). In analysis adjusted for age, sex, baseline BMI, CD4+ cell count and viral load, male gender independently predicted successful treatment outcome (aOR=3.00; 95%CI 1.06-8.77; $P< 0.05$).

Conclusions and Recommendations: The proportion of patients that achieved cure following completion of treatment was high. The male gender was associated with positive treatment outcome. Therefore, clinical improvement monitoring should be encouraged and sustained to achieve positive treatment outcome especially in TB/HIV co-infected patients.

THPEA008

Low Prevalence of Rifampicin-resistance among New TB/HIV Co-infected Patients in Bamako, Mali

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Background: Tuberculosis (TB) is the leading cause of death in HIV-infected patients.The situation is further aggravated by the emergence of drug-resistant strains. In Mali the prevalence of HIV/TB patients is 14% which is ten times greater than that of the general adult's population of 1.2%. The objective of our study was to determine if HIV is a risk factor for rifampicin resistance and/or multidrug-resistant tuberculosis in new TB patients co-infected.
Methods: Between February 2015 and May 2018 we conducted a cross sectional study in UCRC´s BSL3 laboratory with pulmonary tuberculosis patients. The study was approved by the ethics committee of FMPOS and Anvers. TB diagnosis was done by Concentrated Smear microscopy followed by culture. Xpert MTB/RIF was done to determine Rifampicin resistant strain. HIV status was determined by rapid diagnosis Test, followed by Elisa and confirmed by Western Blot.
Results: Of the 1,212 TB patients were enrolled, 108 (8.9%) were co-infected with HIV. The prevalence of TB/HIV was 8.91% (108/1212). The Xpert MTB/Rif was performed on 205 samples (9 TB / HIV and 196 TB) who were patients with treatment failure or relapse. The prevalence of Rifampicin resistance was high among TB/HIV patients who failed treatment and /or relapse compare to TB patients having the same characteristics 11.11% (1/9) versus 7.14% (14/196). However, the prevalence of RR was slightly low in all HIV/TB patient compare to all TB patients of the study population 0.9% (1/108) versus 1.2% (14/1104). HIV Positive Patient has two time more chance to be RR than HIV Negative patient OR: 2.27 CI: 0.30 - 17.04.
Conclusions: These findings showed that HIV/TB co-infected patient are not more exposed to TB treatment resistance than TB mono-infected patient. Resistance should be monitor in the same way in HIV and HIV/TB patients.
Key Words: TB, HIV, co-infection, Rifampicin Resistance.

THPEA009

Treatment Initiation Delay among Tuberculosis Patients Attending TB Dots Clinic in Lagos, Nigeria

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Background: TB is a major cause of morbidity and mortality in Africa with a rising burden of MDRTB and TB/HIV co-infection. Among the Stop TB Strategies are accurate diagnoses and prompt initiation of effective treatment which greatly improves the prognosis. However this goal is hampered by delayed diagnosis and treatment initiation especially in resource limited settings. The aim of this study was to determine the rate of, and factors associated with delay in treatment initiation among TB patients in Lagos, Nigeria.

Methods: In a prospective study of 118 TB patients undergoing anti-tuberculosis treatment in a TB reference centre in Lagos, Nigeria. Questionnaire were administered, sputum and blood samples for laboratory investigation were collected before commencement and bi-monthly from consented participants that fulfilled recruitment criteria.

Results: Analysis of preliminary data of an ongoing Clinical Trial from the Nim-epid platform from March 2018 to March 2019 is presented. There were 118 TB patients: 61% male, 55.1% HIV/TB Co-infection, and with mean age of 39.9 (SD 11.5) years. Twenty-four (23.3%) of the patient were either relapsed or had treatment beyond 6 months. The median (IQR) period between TB diagnosis and presentation for treatment initiation was 3 (1-7) days. Total time to treatment initiation (>3 days after diagnosis) was observed in 53.0% with a median (IQR) duration of 8 (6 - 17). Treatment delay did not occur at the level of health system (1 (0-2.25), however it was secondary to patient factor. Patient delayed presentation for treatment (>3 days after diagnosis) was observed in 53.0% with a median (IQR) duration of 6.5 (5.0-16.3) days. Patient delay was more among female (8 (5-21.5)) and HIV/TB co-infection patients (7 (5-17)). Reasons for the delay included being too busy at work, having travelled out of town, and preference for staring TB treatment at the next HIV care appointment for the HIV/TB co-infected patients.

Conclusions and Recommendations: Active case finding and early TB treatment initiation are key factors in the Stop TB agenda. Delayed treatment initiation is associated with poorer treatment outcome as well as risk of TB transmission in the community. The high rate of delayed treatment initiation in this study is a cause for concern and calls for concerted efforts to ensure prompt treatment initiation in diagnosed individuals.

THPEA010

Stratégie de Diagnostic des Personnes Coinfectées TB et VIH dans les Maisons d'Arrêt et de Correction. Cas des 34 Maisons d'Arrêt et de Correction de Côte d'Ivoire

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Dans le cadre du projet Fonds Mondial de lutte contre la Tuberculose et le VIH/sida dans les 34 prisons de Côte d'Ivoire, un dispositif de prévention et de prise en charge des deux pandémies a été mis en place par EXPERTISE France avec l'appui des acteurs communautaires. En 2018, ce dispositif a permis de diagnostiquer et de mettre sous traitement, 12 détenus Coinfectés TB /VIH.
Méthodologie: 43 Conseillers Communautaires et 206 détenus Educateurs de Pairs ont été formés sur la tuberculose et le VIH/sida pour assurer la prévention et le suivi des patients dans les 34 prisons du pays. Chaque mois, les détenus Educateurs de Pairs réfèrent les détenus PVVIH sous traitement ARV, des cellules vers l'infirmerie pour une évaluation sanitaire en vue du renouvellement de leur traitement ARV. Les Conseillers communautaires en poste à l'infirmerie, font le screening verbal de la tuberculose chez ces détenus PVVIH à partir du questionnaire de dépistage présomptif.
De plus, ces conseillers Communautaires font bénéficier aux nouveaux détenus au moment de leur incarcération, le dépistage du VIH après sensibilisation, counseling et consentement éclairé mais aussi la recherche active de la tuberculose.
Ces stratégies ont permis de diagnostiquer et de mettre sous traitement, les détenus coinfectés TB/VIH.
Résultats:
· Au total de janvier à décembre 2018, 501 détenus PVVIH ont bénéficié du dépistage présomptif verbal de la TB
· 64 détenus PVVIH présentant des signes présomptifs de la tuberculose ont été référés aux infirmiers. Leurs crachats ont été prélevés et convoyés au laboratoire pour examens bactériologiques
· 12 cas de TB notifiés et mis sous traitement sur les 64 PVVIH ; soit 18, 75 %% de coïnfection TB/VIH.
Conclusion: Le dispositif préventif communautaire en vigueur à l'entrée des prisons couplé à la stratégie du renouvellement mensuel des ARV chez les détenus PVVIH permet de déceler systématiquement et de mettre sous traitement, les cas de co-infection TB/VIH

THPEA011

Optimizing Household Adherence Counselling Models (HACM) as an Effective Treatment Plan in Management of HIV/TB Co-infection in Northern Nigeria

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Background: Default in TB treatment remains a global concern. Poor adherence to treatment decline significantly after presenting symptoms abates, thus a need to strengthen counselling in these periods. Identifying household contacts of index clients and providing group counselling provides an alternative strategy for improved treatment outcomes. This study aims to determine and compare the effectiveness of household adherence counselling and continuation of directly observed treatment (DOTS).
Methods: A comparative study conducted at the AIDS Healthcare Foundation supported clinics Northern Nigeria from October 2014 to May 2019. The sample comprised of Ninety patients (N=90) HIV patients diagnosed with pulmonary tuberculosis. The random sampling technique was used for the assignment of the patients to the experimental group (n= 45) and a control group (n=45). Data was analyzed with SPSS version 12
Results: The results indicated that the majority of the experimental group patients adhered to the therapy 37 (83.3%) till the last follow -up counseling session dropout rate was 7.47 (16.6%) while among control group 31 (70 %) continued the treatment and kept on coming up for follow up sessions their dropout rate was 14 (30%).
Conclusions and recommendations: While being mindful of discrimination, household involvement in TB counselling provides a better adherence counselling plan and should be encouraged by TB treatment programs.

THPEA012

Apport du GeneXpert dans la Prise en Charge Intégrée de la Tuberculose au Service des Maladies Infectieuses et Tropicales du CHU de Treichville de Juillet 2015 à Juillet 2018

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Contexte de l'étude: Le GeneXpert, nouvel outil diagnostic de la tuberculose recommandé par l'Organisation Mondiale de la Santé (OMS) a été mise à la disposition des pays à forte prévalence tuberculeuse pour le diagnostic et la prise en charge optimale des patients coinfectés par la tuberculose et le VIH. L'Objectif principal de notre étude était d'évaluer l'apport du GeneXpert dans la confirmation du diagnostic de la tuberculose chez les patients vivant avec le VIH au Service des Maladies Infectieuses et Tropicales (SMIT).
Méthodes: Il s'est agi d'une étude transversale descriptive conduite au SMIT- de la période de Juillet 2015 à Juillet 2018. Ont été inclus les patients adultes infectés par le VIH ayant bénéficié de la PCR- BK, GeneXpert pour le diagnostic de la tuberculose. L'évaluation primaire a porté sur la proportion des patients chez qui la réalisation du GeneXpert est revenue positif .L' évaluation secondaire était la proportion de patients avec *Mycobacterium Tuberculosis* résistant à la rifampicine.
Résultats: 6450 ont été reçus en consultation et/ou hospitalisés durant la période de l'étude avec 334 patients inclus. L'âge médian des patients est de 42 ans. Le sexe masculin était prédominant avec sex ratio à 1,23.Le stade clinique CDC le plus retrouvé était le stade B 119 (73%). Le taux de CD4 médian était de 105 cellules /mm avec IIQ [41-160] et une charge virale médiane à 36100. Le nombre de patients avec GeneXpert positif et bacilloscopie négative était de 163 (48%). L'apport du GeneXpert dans le diagnostic de la tuberculose est estimé à 32%. Le taux de résistance de *Mycobacterium tuberculosis* à la rifampicine était de 10 %. Les facteurs significativement associés à un GeneXpert positif étaient le sexe et le fait d'être sous traitement antirétroviral.
Conclusion et recommandations: Cette étude a permis de démontrer l'apport bénéfique de l'utilisation du GeneXpert avec un niveau de résistance du *Mycobacterium tuberculosis* relativement élevé à la rifampicine. Ses résultats soulignent la nécessité de la mise en place d'une surveillance épidémiologique.
Mots clés: Tuberculose - VIH - GeneXpert- Abidjan

THPEA013

Infection Anale à Papillomavirus Humains à Haut Risque (HR-PVH) chez les Hommes Homosexuels au Mali

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Contexte: Les infections à papillomavirus humain (VPH) à haut risque (HR-VPH) sont fréquentes chez les hommes ayant des rapports sexuels avec des hommes (HSH), en particulier ceux infectés par le VIH.
Objectif: La prévalence des HR-HPV anaux et des facteurs de risque associés a été estimée dans une étude observationnelle transversale portant sur les HSH vivant à Bamako, Mali.
Méthodes: Les HSH recevant des soins au Centre spécialisé de prise en charge des Populations clés de l'ONG national SOUTOURA à Bamako ont été inclus prospectivement. Leur statut sérologique VIH et les caractéristiques sociodémographiques et comportementales ont été recueillis. Les principaux HPV ont été détectés et génotypés à partir d'écouvillons anaux en PCR multiplex (Anyplex ™ II HPV28, Seegene, Corée du Sud). Des analyses de régression logistique ont été effectuées.
Résultats: 29 HSH (âge moyen, 26 ans; extrêmes, 18 à 35 ans), dont 48,3% de personnes séropositives pour le VIH-1 et 51,7% des personnes séronégatives ont été inclus. La prévalence des VPH anaux était de 62,1%, dont 44,8% de HR-VPH qui étaient multiples dans 31,0% des cas. Les génotypes les plus répandus étaient HPV-16, HPV-18, HPV-40 et HPV-67, alors que les HPV-31 et HPV-35 étaient présents dans une minorité d´échantillons. Les infections HR-HPV multiples étaient plus fréquentes chez les HSH séropositifs pour le VIH (55,6%) par rapport à ceux séronégatifs pour le VIH (44,4%). Les HSH infectés par HPV-16 et HPV-18 étaient majoritairement infectés par le VIH-1, à 55,5% et 60%, respectivement. Les génotypes de VPH couverts par le vaccin prophylactique Gardasil-9® étaient détectés dans 58,6% des échantillons ; le HPV-16 était le plus fréquemment détecté. Le HPV-33 n'était pas détecté. Les rapports sexuels non protégés étaient le principal facteur de risque d´être infecté par n´importe quel type de VPH. Les rapports anaux insertifs étaient significativement moins associés à la contamination par les VPH que les rapports anaux réceptifs (P< 0,02).
Conclusion et recommandations: Les HSH vivant à Bamako sont à risque d´infections anales par le VIH et les HR-VPH. Le renforcement des stratégies de prévention contre les infections à VPH et les cancers associés adaptés aux HSH en Afrique doit être une priorité. Des interventions innovantes devraient être conçues pour la population des HSH vivant à Bamako.
Mots clés: HR-VPH, HSH, SOUTOURA, Bamako

THPEA014

Predictors of Mortality in HIV Patients with Severe PCP Admitted to Intensive Care Unit: A Systematic Review

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Introduction: Despite current developments in HIV medicine and wide scale use of HAART, PCP (Pneumocystis Carinii Pneumonia) still remains to be an important cause of respiratory failure requiring ICU (Intensive Care Unit) care especially in developing countries. To date, there have been published studies on mortality predictors in PCP patients in ICU but not systematic reviews.
Aim: To look in to mortality predictors in HIV patients with severe PCP receiving ICU care.
Methods: A systematic review was done to look for predictors of mortality in HIV patients with severe PCP admitted to ICU. Eligible studies were cohort and case control study designs that report predictors or risk factors for ICU mortality. Studies that reported separate outcome for ICU patients with HIV/PCP were included. PubMed, Embase and Medline search was made from 2005-2017. In addition grey literature search was also made to address publication bias. Two authors independently screened titles and abstracts of all citations identified in the search. Quality assessment of relevant articles was made using CASP tool for cohort study appraisal.
Results: Initial search resulted 257 articles, out of which a final 8 were included in the synthesis. Most studies were in the pre-HAART era. All studies had a cohort design. Overall mortality ranged from 53%-81% in the pre-HAART which reduced to 25% following introduction of HARRT. In the high quality studies, need of mechanical ventilator, development of pneumothorax, and duration of medical therapy prior to ICU admission were significantly associated with mortality.
Conclusion: The results of this review indicate HAART improved intensive care unit mortality among HIV patients with severe PCP. Those patients requiring mechanical ventilator, developing pneumothorax and receiving longer duration medical therapy prior to ICU admission had a worse prognosis. Mortality predictors generally were comparable in pre and post HAART era.

THPEA015

Coinfection VIH, *Mansonella Perstans* et *Loa Loa* chez les Individus Vivant en Zone Rurale du Gabon, Afrique Centrale

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Introduction : Les données concernant la relation entre filaires et les effets des antirétroviraux (ARV) et du Cotrimoxazole (CTX) chez les personnes vivant avec le VIH (PVVIH), sont manquantes.
Objectif : Cette étude estimait la prevalence des microfilaires sanguicoles dans un groupe de PVVIH vivant en zones rurales du Gabon, puis évaluait la relation avec la prise des ARV et du CTX.
Matériel et Méthodes : Il s'agissait d'une étude prospective et transversale, où les PVVIH reçues en consultation de routine étaient recrutés. Un groupe de séronégatifs pour le VIH constituait le groupe témoin. La recherche des microfilaires était réalisée par examen direct puis par concentration. Les données sur le traitement antirétroviral (TARV) et les informations sur la prise du CTX étaient recueillis à partir des carnets de soin et des dossiers médicaux des patients.
Résultats : Un total de 209 PVVIH et 148 séronégatifs a été inclus. La majorité des PVVIH étaient sous première ligne de TARV (94,9%; n=169/178) et plus de la moitié sous CTX (58,1%; n=107/184). La prévalence des microfilaires était similaire entre les PVVIH (19,9% ; n=41/206) et les séronégatifs (14,8% ; n=22/148) (p=0,2), de même que la fréquence de la loaose (p=0,2); alors que celle de *Mansonella perstans* était quatorze fois plus élevée chez les PVVIH (p=0,0004). La fréquence de *Loa loa* était similaire entre les patients sous TARV de première et seconde ligne (p=0,9); alors qu'aucun patient sous TARV de seconde ligne n'était infecté par *Mansonella perstans*. La parasitémie médiane de *Loa loa* était six fois plus faible chez les patients sous CTX que chez ceux qui n'étaient pas sous prophylaxie. Cependant, la microfilarémie médiane de *Mansonella perstans* était comparable entre participants prenant ou non du CTX.
Conclusion: Cette étude a permise d'estimer la fréquence des microfilaires *Loa loa* et *Mansonella perstans* dans un groupe de PVVIH et de révéler les effets variables des ARV et du CTX sur la fréquence de ces microfilaires.

THPEA016

Intestinal Parasitic Coinfections and Adherence to Antiretroviral Therapy among HIV/Aids Clients Accessing Haart in Otukpo, Benue State, Nigeria

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Background: Intestinal parasitic infections (IPI) is a major cause of morbidity among HIV infected individuals even on highly active antiretroviral therapy (HAART). Suboptimal adherence (< 95%) to antiretroviral therapy (ART) continues to be a major challenge affecting the HIV/AIDS treatment effort, especial in low and middle income countries. The objective of the study was to evaluate the prevalence of IPI among HIV infected individuals in relation to their ART adherence status.

Methods: An evaluation of IPI and adherence to ART among adult HIV infected individuals accessing HAART was conducted between May and November, 2017. Participants records were reviewed for clinical and biodemographic information and ART adherence status. Participants were given two well labelled sterile screw-capped containers for stool samples collection after giving consent. $CD^{+}4$ enumeration and viral load quantification assays were conducted. Direct wet mount of faecal samples in normal saline (0.85% NaCl) were prepared for the identification of ova and larvae of helminths. Samples were further processed using faecal parasite concentrator. Slides were stained with Lugol's iodine, modified Ziehl-Neelsen acid fast and Giemsa stains for the identification of amoebae, flagellates, coccidians and microsporidians and examined under a light microscope using x10 and x40 objectives. Data were analysed using chi-square test and SPSS version 22.

Results: Out of the 757 participants on studied, females constituted 57.7% (n=437). Optimal ART adherence (≥95%) rate was 61.9% (n=469). More females (n=301, 64.2%) than males (n=168, 35.8%) had optimal adherence status. IPI were significantly high ($p< 0.05$) among suboptimal ART adherence individuals (37.5%, n=108) compared to optimal adherence individuals (3.4%, n=16). IPI were higher among females in both adherence index groups (52.8%, n=57 and 56.2%, n=9 respectively). IPI were significantly associated with low $CD^{+}4 < 350$ cells/mm^3 (33.7%, n=97) and high viral load >1000 copies/ml (37.5%, n=108).

Conclusions and Recommendations: Routine screening for IPI, especially those with suboptimal ART adherence status is expedient. Coinfected individuals should be promptly treated and monitored. Antiparasitic drugs should be provided periodically as prophylaxis to HIV infected individuals on HAART to enhance the overall care and treatment.

Keywords: Adherence, ART, HIV, intestinal parasites

THPEA017

Les Etiologies des Ulcerations Associées au VIH a Bamako

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Introduction / Objectifs: L´infection par les HSV est la cause la plus fréquente d´ulcérations génitales dans le monde et constitue aussi un cofacteur de transmission du VIH et d'autres infections sexuellement transmissibles (IST) avec deux à trois fois plus de risque d´acquérir le VIH. Le but de cette étude était de déterminer la fréquence des HSV dans les ulcérations buccales ou génitales chez les PVVIH suivies dans deux sites à Bamako.

Méthodes: Il s'agissait d'une étude prospective à but descriptif menée chez 53 PVVIH suivies au CESAC de Bamako et dans le service des maladies infectieuses et tropicales du CHU du Point G de janvier à août 2018. Les échantillons ont été prélevés sur des lésions ulcératives au niveau buccal et génital par écouvillonnage appuyé avec le sigma-virocult® et transporté à l'INRSP. L'extraction des ADN a été faite par le QIamp DNA mini kit 250 (Qiagen). La technique de rtPCR en temps réel sur le LightCycler 480 (LC-480) de Roche a été utilisée pour la détection simultanée des HSV-1 et HSV-2 (Kit R-gene HSV-1, HSV-2, VZV, Argène®).

Résultats: Sur les 53 échantillons, 18 étaient buccaux, et 31 génitaux. La majorité des patients (84,9%) avait un âge compris entre 30 et 62 ans et la plupart était de sexe féminin (66%). 79,2% étaient sous traitement ARV. La fréquence des HSV était de 58,48% (31/53). Le taux de détection était respectivement de 65,2% et 34,8% pour ulcérations génitales et buccales.La détection des HSV dans les ulcérations était réparti comme suit : 30,2% pour HSV-2 ; 15,1% pour HSV-1 et 9,4% pour la co-infection HSV-1/HSV-2). Parmi les ulcérations buccales 31,6% étaient dues à HSV-1 et 15,8% à HSV-2, et il n´y a pas eu de co-infection HSV-1/HSV-2. Dans les ulcérations génitales 3,4% étaient dues à HSV-1, 48,3% pour HSV-2 et 17,2% pour la co-infection.

Conclusions et Recommandations: Devant toute ulcération sur VIH penser toujours a l´herpès mais toute ulceration n est pas VIH.par conséquent devant une ulcération rebelle au traitement herpétique la recherche d autres etiologies s imposent.

Mots clés: *HSV-1, HSV-2*, VIH, Co-infection, ulcération

THPEA018

HIV-1 Infected Individuals Are at a Higher Risk of HPV 16 Associated Oral and Oropharyngeal Squamous Cell Carcinoma than HPV 18

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Background: Recent studies suggest HIV-infected individuals have an overall oral HPV DNA prevalence between 20% and 45% (in the alpha genus), and an oncogenic oral HPV DNA prevalence between 12% and 26%. This study aimed at determining the prevalence of HPV 16, 18 and factors associated with oral and oropharyngeal squamous cell carcinoma (OPSCC) among HIV-1 infected patients attending Mulago Hospital, Uganda 2010-2015 in comparison to HIV-1 uninfected individuals.
Methods: This was a cross sectional study in which 174 HPV DNA positive tissue blocks diagnosed with oral and oral pharyngeal squamous cell carcinoma were stained with Hematoxylin and Eosin (H&E) to confirm the diagnosis. They were genotyped for HPV 16, 18 using conventional SPF10 PCR techniques. The study site was Mulago Hospital, Uganda.
Results: 200 tissue blocks were diagnosed with Squamous cell carcinoma, 174 were positive for HPV DNA. HPV genotypes 16 and 18 were identifiable in 165 cases: HPV 16 occurred in 92 cases (52.8%) and HPV 18 occurred in 41 cases (41.95%). The overall HPV prevalence was 73.16%. HIV was the only risk factor associated with HPV 16 (p=0.018).
Conclusions and Recommendations: We confirmed a role of HPV16 and 18 in OPSCC pathogenesis in HIV-1 infected individuals in the Ugandan population. The results suggest HPV16 is an etiological factor responsible for the high occurrence of oral and oral pharyngeal squamous carcinoma among HIV-1 infected people in this population.

THPEA019

Relation between Toxoplasmic IgG Serology and the Immunovirological Status of People Living with HIV in Yaounde, Cameroon

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Background: Toxoplasmosis is an opportunistic parasitic disease, which is transient in immunocompetent persons but can be fatal in people Living with HIV (PLHIV) immunocompromised. The purpose of this study was therefore, to establish the relation between the toxoplasmic IgG serology and the immunovirological status of PLHIV. Specifically, we researched the seroprevalence of antitoxoplasmic IgG and we appreciated the correlation between the level of antitoxoplasmic IgG, viremia of HIV-1 and CD4 count.

Methods: We conducted a cross-sectional and analytical study between June 2018 and November 2018 at the "Chantal Biya" International Reference Center with 100 HIV positive consenting participants. Additional data were collected using a questionnaire. The IgG antitoxoplasmic level was assessed by quantitative ELISA on the plate reader MR-96A, the CD4 count was done on Cyflow cytometer and the HIV-1 viral load by quantitative RT-PCR on the abbott m2000rt. The data analyses were carried out using Microsoft Excel 2016 and GraphPad6. Results were considered statistically significant with P Value < 0.05.

Results: We enrolled 100 PLWH with a sex ratio of 1.56 for women. The mean age was 44.57 ± 11.49 years, with extremes ranging from 19 to 71 years. Of these patients, 56% (100) were seropositive to IgG anti-*Toxoplasma gondii*; 43% (43) had CD4 counts < 500/mm^3 and 18% (18) had viremia >3Log$_{10}$. All participants (11) whose CD4 < 200/mm^3 were positive to IgG antitoxoplasmic serology, versus 34% (16) with CD4 count belong [200-500 mm^3[. As concerns viral load, all participants (18) with viremia >3Log$_{10}$ were positive to antitoxoplasmic IgG versus 82 with viremia < 3Log$_{10}$. The coefficient correlation between the antitoxoplasmic IgG level and HIV-1 viral load was 0.54 (P < 0.001) and - 0.70 (P < 0.0001) between antitoxoplasmic IgG level and CD4 lymphocytes count.

Conclusion and Recommendation: In the camerounian context, more than half of the study population was seropositive to antitoxoplasmic IgG. All participants experiencing a severe Immunodeficiency were seropositive to toxoplasmosis. Of note, antitoxoplasmic IgG level has a strong positive correlation with HIV-1 viral load and a strong negative correlation with CD4 lymphocytes count. Antitoxoplasmic IgG should be routinely screened in immunocompromised PLHIV to prevent toxoplasmosis recurrence.

Keywords: ELISA: Enzym Linked Immunosorbent Assay
RT-PCR: Real Time Polymerase Chain Reaction by retrotranscription

THPEA020

Atypical Gouty Arthritis in HIV Sero-positive Patients

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Background: Atypical gout in HIV sero-positive patients has not been described before. We describe atypical gouty arthritis in two HIV sero-positive patients who presented to a peri-urban hospital in Kampala, Uganda.
Methods: We analyzed the laboratory parameters of two symptomatic HIV sero-positive male patients who had presented with atypical complaints of sudden severe knee and hip joint pains.
Results: Patient 1 was a known hypertensive on calcium channel blockers. Both patients had reported history of regular alcohol and red meat consumption. Clinical examinations revealed both patients in agonizing pain with tenderness and severe pain on hyperextension of the hip and knee joints. Radiographs showed marginal joint erosions. Joint fluid aspirates showed intracellular, needle-shaped, negatively bi-refringent crystals. Both patients were diagnosed with atypical gouty arthritis.
Both patients were managed with dietary advice, steroids, weekly intra-muscular and oral NSAIDs. Patient 2 made remarkable improvement with no new episodes of arthritis have occurred in the 6 month follow-up period. Patient 1 however did not follow the dietary advice given to him and subsequent uric acid levels were much higher than the index levels. He is still undergoing management. No new episodes of arthritis have occurred though.
Conclusions and Recommendations: Key features in this report are the atypical gouty arthritis presentations developing in patients on HAART. It is imperative for clinicians to be aware that rheumatologic presentations especially gout may become an increasing clinical challenge in the future for patients on NNRTI-containing regimens.

THPEA021

Profil Bactériologique des Infections Uro Génitales chez les Enfants Infectes par le VIH a l'Hôpital Pédiatrique de Kalembe Lembe

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Introduction: Les infections bactériennes restent la première cause des infections sévères chez les PVVIH. dans nos milieux l'antibiothérapie est souvent probabiliste, en se basant sur l'épidémiologie des germes et l'expérience en termes de la sensibilité des germes aux antibiotiques usuelles.La récurrence des infections, l'utilisation abusive des antibiotiques et la qualité des produits requièrent une actualisation du profil bactériologique et de la sensibilité aux antibiotiques.
Objectif: Déterminer le profil bactériologique responsable des infections urogénitales chez les enfants et ados infectées par le VIH.
Methodologie: Etude transversale portant sur les résultats les analyses bactériologiques réalisées entre janvier 2015 et mars 2019 à partir des secrétions urogénitales chez les enfants suivis au service des maladies Infectieuses de l'Hôpital pédiatrique de Kalembelembe à Kinshasa/RDC.
La mise en culture des échantillons était réalisée dans les milieux ordinaires, l'identification des germes par la galerie minimale de LE MINOR et la sensibilité des germes aux antibiotiques par la méthode de diffusion sur milieu gélosé de MUELLER HINTON.
Resultat: Sur 98 échantillons analysés, 54 (55,1%) appartenaient aux enfants de sexe féminin. La tranche d'âge entre 0 - 4 ans représentait 73,5 %, suivie de celle entre 5 - 9 ans avec 12,2% puis entre 10 - 14 ans et 15 ans et plus, avec respectivement, 102% 4,1%.
Au total 22 (22,5%) échantillons étaient positifs à des germes spécifiques et l'uroculture était demandée dans 86,4%.
Parmi les germes isolés, E. coli représentaient 68,2%, Klebsiella Oxytoca 9,1%, Klebsiella pneumoniae 4,5%, ainsi que le Citrobacter freundii, Acinebacter sp, Proteus sp, Enterobactersp.
Tous les germes étaient multi résistants aux céphalosporines de la 3° génération, aux aminosides et aux glucopeptides avec une faible résistance aux antiseptiques urinaires comme la nitrofurantoine (44%) et les fluoroquinolones (38%).
Conclusion et Recommandation: L'infection urogénitale chez les enfants infectés par le VIH a été confirmée dans 22,5% des isolats, avec une prédominance des grams négatif et une résistance aux antibiotiques usuels.
Vu le coût des analyses, le temps de rendu des résultats et la situation socio-économique de PVVIH, il serait donc opportun de mener une étude à grande échelle afin de redéfinir le profil des germes et leur de sensibilité aux antibiotiques et de proposer un traitement précoce, adapté et efficace.

THPEA022

Outbreak of Anal Warts Surges HIV Infections in Nairobi Kenya

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Issues: For the last 3 months, there has been an outbreak of anal warts in MSM in Nairobi. Some of these anal warts went untreated and they enlarged and became surgical warts. The clinics available would only treat anal warts when in the initial stages and not in the surgical stage.
Description: Over 300 cases of anal warts have been reported. About 100 of them are surgical warts. In partnership with local clinics we have been able to treat over 30 cases of surgical warts and over 100 of the warts in the initial stages.
Lessons Learnt: During the treatment of the all warts (surgical and non-surgical warts), about 200 of these clients had HIV infections. They had to be put on ART immediately even as they went through warts treatment.
Next steps: Reason for the outbreak needs to be interrogated more and the findings disseminated across all networks dealing with HIV programming.
A lot of health education in regard to warts need to be scaled up and highlight that warts can be transmitted by uninfected genitals touching other warts-infected genitals.
More resources should be set aside to treat surgical warts.
Condoms need to be used even before romancing and before touching the other sexual partner.

THPEA023

Dapivirine Ring End-user Assessment, Segmentation, Positioning and Messaging amongst Women End-users and Male Influencers

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Background: The purpose of this study is to understand the beliefs, barriers and behaviors that might influence women's potential uptake of the monthly Dapivirine Vaginal Ring, if approved, and identify the most likely end-user population for the ring through segmentation analysis.
Methods: This study was conducted in three phases in rural and urban locations in Malawi, South Africa, Uganda and Zimbabwe, where Phase III ring trials took place. In Phase 1, qualitative research was conducted through in-depth interviews with 120 women to inform the development of context-specific quantitative surveys for Phase 2. In Phase 2, 1,281 women, equally split across 3 age groups (15-18 , 19-29 and 30-45 years), and 150 men ages 15 and above (potential influencers to ring use) were interviewed. The main objective of this phase was to identify potential end-user segments based on demographics, HIV risk behaviors, willingness to use the DPV ring and other variables. Phase 3 consisted of in-depth interviews with a sub-sample of 120 women from Phase 2 research to better understand key segment-specific behaviors.
Results: For each country, 4-5 segments were identified along with segment-specific motivators and barriers to ring use. Women from rural locations and younger women ages 15-29 years were more likely to use the ring. The age range preference had one notable exception within South Africa, where older women were more likely to use the ring. Common barriers included a fear of perceived side effects and concerns over the insertion process. Complex partner dynamics were shown to be influential, with a number of women expressing contradictory low perceived HIV risk levels due to trust in male sexual partners, followed by subsequent admissions of doubt in the partner´s faithfulness.
Conclusions and Recommendations: This study showed that HIV risk perceptions and behaviors are complicated, with some women who face high HIV risk perceiving they are at low risk and therefore perceiving little need to use preventive measures. By contract, some women who face lower risk actively seek out methods to prevent HIV. These behaviors are often motivated by relationship dynamics, so HIV prevention strategies targeted at women should seek to include their sex partners as they often play an influential role in women's HIV prevention decision-making. These findings will be used to guide the content, channels and types of educational materials necessary to reach this targeted audience.

THPEA025

HIV Drug Resistance in Ghana: Results from a Population-based Household Survey

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Background: In Ghana antiretroviral treatment (ART) programme is the largest globally with >4 million HIV-infected persons receiving standardized treatment regimens. Monitoring levels of HIV drug resistance (HIVDR) is a priority activity for the country. HIVDR testing was included for the first time in the 5th national HIV household survey conducted in 2017.
Methods: Multi-stage stratified cross-sectional random sampling was used to select households for participation nationally. Dried blood spots were tested to determine HIV status, estimated recency of infection, exposure to antiretroviral drugs (ARVs), and HIVDR in addition to behavioral data from all household members who agreed to participate. HIVDR testing was conducted on HIV-positive samples with viral load ≥1000 copies/ml using next generation sequencing methodologies.
Results: 1107 HIV positive samples from virally unsuppressed participants, 697 (63%) were successfully amplified by polymerase chain reaction and sequenced. Drug resistant mutations (DRM) were identified in 27.4% (95% CI 22.8-32.6) of samples: 18.9%(95% CI 14.8-23.8) had resistance to non-nucleoside reverse transcriptase inhibitors (NNRTIs) only, 7.8% (95% CI 5.6-10.9) had dual resistance to NNRTIs and nucleoside reverse transcriptase inhibitors(NRTIs), and 0.5% (95% CI 0.1-2.1) had resistance to second-line regimens that include protease inhibitors (PIs),NNRTIs, and NRTIs). Table 1 shows HIVDR by exposure to ARVs, sex, and age. NNRTI-only resistance was found in 14.3% ARV+ve and 20.0% ARV-ve samples (p=0.311), while dual NNRTI and NRTI resistance occurred in 40% ARV+ve and 2.1% ARV-ve samples (p< 0.001). Among those who were ARV-ve but self-reported daily ARV use (ARV defaulters; n=41), 75.6% had DRM; 56.4% with NNRTI-only resistance, 14.3% with dual NNRTI and NRTI resistance. There were no significant age and sex differences among either NNRTI-only resistant and dual NNRTI and NRTI resistant samples.
Conclusions: These findings demonstrate high proportions of DRM among virally unsuppressed HIV-infected persons in South Africa. While these results include treatment defaulters, potential pretreatment HIVDR levels are concerning. Programmatic implications include stronger adherence support to reduce ARV defaulting, and strengthened first line ART regimens by including integrase strand transfer inhibitors (INSTIs) as a part of first line treatment.

THPEA026

HIV-1 Non-B Protease A22V Is a Novel Mutation Associated with Failure to Second-line Antiretroviral Therapy: A Case-control Study from Cameroon

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Background: HIV treatment response has been extensively studied on subtype B and adapted for use on non-B strains that are highly prevalent in sub-Saharan Africa (SSA), with imperfect knowledge of non-B drug resistance mechanism. Our objective was to determine novel potential mutations selected among non-B HIV-1 infected patients experiencing virological failure.
Methods: A "case-control" study was conducted among HIV-1 infected patients at the Chantal BIYA International Reference Centre (CIRCB), Yaoundé, Cameroon. Using ART-naïve as "control" vs. ART-failure as "case", HIV-1 protease(PR)/reverse-transcriptase(RT) sequences were aligned using Bioeditv7.0.4.1, then translated into amino acids and variants (mutations) detected with reference to HXB2. Novel mutations, not described on expert lists (Stanford HIVdb, IAS-USA), were compared between control vs. case groups; with $p< 0.05$ considered statistically significant.
Results: A total of 441 non-B HIV-1 infected patients (aged 15-74 years; 61.68% female) were enrolled: 135 ART-naïve (CD4: 206 [IQR:72;333] cells/mm^3; viremia: 180,900 [IQR:53.400;617,320] copies/ml); 199 failing first-line ART (CD4: 126 [IQR:55;241] cells/mm^3; viremia: 50,828 [IQR:5,280;90,756] copies/ml); and 107 failing second-line ART (CD4-counts: 110 [IQR:45;150] cells/mm^3; viremia: 38,000 [IQR:10,230-111,596] copies/ml). Phylogeny revealed 60.54% (267) CRF02_AG, 10.66% (47) A1, 7.94% (35) D and others (20.86%). In the RT-region, mutation I142T was reported at 1.53% (ART-naïve) vs. 3.41% (first-line failing-patients), suggesting a 2-fold increase (p=0.47). In the PR-region, mutation A22V was reported at 0.74% (ART-naïve) vs. 5.6% (second-line failing patients), indicating a significant 7-fold increase (p=0.04) for patients treated with ritonavir boosted atazanavir and/or lopinavir-containing-regimens; followed by T4S (0.74% vs. 2.25% respectively, p=0.47). All other PR-RT mutations not associated with HIVDR were detected at similar rates in both the control and case groups.
Conclusions and Recommendations: In this predominant HIV-1 non-B CRF02_AG infected population, decreased immunity and viral replication (from ART-naïve to first- and second-line ART-exposure) suggest loss of viral fitness with emerging mutations. Interestingly, PR-mutation A22V, selected under drug pressure, insinuates potential clinical impact on failure to protease inhibitor-based therapy among non-B infected patients in SSA.

THPEA027

Prévalence de la Résistance Prétraitement aux Inhibiteurs d'Intégrase du VIH-1 au Mali

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Introduction: Les inhibiteurs d'integrase (IN) constituent une classe de choix dans l'arsenal thérapeutique actuel selon les nouvelles recommandations 2018 de l'OMS. Le but de ce travail était d´évaluer la fréquence de virus porteurs de mutations de résistance aux inhibiteurs de l'intégrase chez les patients VIH-1 naïfs de traitement antirétroviral.

Méthodes: Notre étude a été menée au centre de recherche et de formation sur le VIH/SIDA et la tuberculose (UCRC/SEREFO) à l'USTTB. Le gène de l'integrase a été séquencé selon la technique maison de l'ANRS et les séquences ont été analysées par trois algorithmes, celui de l'ANRS, de STANFORD et de REGA.

Résultats: Nous avons inclus 150 patients VIH-1+ naïfs de tout traitement ARV parmi lesquels 77 provenaient de patients du Centre d'Ecoute, de Soin, d'Animation et de Conseils (CESAC) et 73 de l'hôpital de la Pitié-Salpêtrière de Paris. Les sous types CRF02_AG et B ont été majoritairement détecté avec 48,67% et 48% respectivement.

A l´aide des algorithmes d´interprétation, aucune mutation majeure de résistance n'a été observée mais, nous avons identifié la présence de mutations mineures à quatorze (14) positions, notamment T124A (61,33%) ; T206S (56,67%) ; S119P (10,66%), S230N (4,66%) ; K156N et S119T (4%) ; E157Q et L74M (3,33%) ; S119T, G163E et D232E (2%) ; T97A, G163Q, G163A, V260I et V165I (1,33%), V151I, G163N et A49P (0,66%). Parmi ces polymorphismes seuls trois ont été associés à une résistance aux inhibiteurs de l'intégrase E157Q (3,33%), L74M (3,33%), T92A (1,33%).

Les polymorphismes L74M, E157Q, T97A, S119T, V165I et V260I étaient significativement plus fréquente dans le sous-type CRF02_AG. Alors que S230N, K156N, S119P, V151I, étaient fréquente dans le sous type B. Nous avons observé une prévalence plus élevée de la résistance aux différents inhibiteurs d'intégrase chez les sous-types CRF02_AG du Mali 8,22% que chez le sous-type B de Paris 1,39% ($p < 0,001$). Nous avons obtenu une résistance primaire aux IN de 4,66% selon les algorithmes ANRS et STANFORD et 2% avec REGA.

Conclusion: Nos données suggèrent que l'introduction de cette classe d'ARV en particulier les inhibiteurs d'intégrase de deuxième génération, le Dolutégravir en première ligne de traitement pourrait être très bénéfique pour les patients naïfs car ne présentent aucune mutation de résistance majeures.

Mots clé: VIH-1, Résistance, IN, Mutations, Mali

THPEA028

Résistance Transmise du VIH-1 aux Antirétroviraux chez les Nouveau-nés et Enfants Nés de Mères Séropositives au Mali

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Background: Au Mali, en 2018 le nombre de personnes âgés de 15 ans et plus vivant avec le VIH était estimé à 110 000, les enfants de 0 à 14 ans restent touchés avec 12000 enfants infectés. Dans cette dernière population fragile avec un réel problème pour leur prise en charge thérapeutique, la résistance aux ARV est encore peu évaluée au Mali. Le but de cette étude était d'évaluer la résistance du VIH-1 aux antirétroviraux en milieu pédiatrique au Mali.
Methods: Il s'agit d'une étude prospective ayant porté sur 108 Dried Blood Spot (DBS) VIH+ chez des nouveau-nés et enfants de moins de 18 mois, nés de mères séropositives au VIH-1. Les ADN proviraux ont été extrait avec le kit Qiagen puis amplifiés par PCR nichée à l'aide d'amorces ANRS. Les produits de PCR ont été purifiés par microfiltration sur plaque Nucleofast® sous vide, et séquencés par la méthode de terminaison de chaine utilisant le BigDye terminator v3.1 au laboratoire de virologie à l'INRSP de Bamako. Les produits séquencés ont été précipités à froid par l'acétate de sodium et d'éthanol, puis repris au formamide pour migration sur l'analyseur de séquence génétique ABI 3500. Les séquences des gènes de la reverse transcriptase (RT), de la protéase (Prot) et de l'intégrase (INT) ont été corrigées sur SeqMan de la suite DNAStar® et analysées par l'algorithme Stanford pour la recherche de mutations.
Results: Nous avons trouvé 47,2% de sexe féminin avec une médiane d'âge de 9 mois. Seulement 13% des nouveau-nés et enfants avaient reçu une prophylaxie ARV à la naissance. L'allaitement maternel exclusif était le type d'allaitement le plus utilisé (64,8%). Le taux global de mutations de résistance aux différentes classes étudiées était de 16.66%. La présence d'au moins une mutation de résistance aux INNTI a été trouvée chez 18,75% des enfants, aux INTI chez 12,5%, aux IP chez 6,89%. Les mutations les plus fréquentes pour les INTI étaient M41L, M184V et Y115F avec une fréquence de 6,3% pour chacune ; pour les INNTI, K103N (12,5%), G190A (6,3%), V108I (6,3%), E138Q (6,3%), Y181C (6,3%), H221Y (6,3%). Le sous-type CRF02_AG a été la forme recombinante majoritaire (84%).
Conclusions and Recommendations: Des mutations conférant une résistance aux INTI, INNTI et INT ont été trouvées avec la classe INNTI plus touchée et la sensibilité aux IP conservée dans la population pédiatrique. Cependant, des travaux sur de plus grands échantillons doivent être entrepris.

THPEA029

Renal Function Biomakers and Myoglobin Level Increases in Human Immunodeficiency Virus-1 Infected Subjects on HAART and Newly Diagnosised

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Background: The emergence of highly active antiretroviral therapy (HAART) has led to dramatic improvements in prolonging the life expectancy of HIV-infected patients. However,long-term use may cause kidney derangements that may be life-threatening.
Objectives: This present study seeks to assess the levels of microalbuminuria and myoglobin in HIV positive subjects.
Methods: One hundred and fifty subjects [50 HIV negative, 50 positive HAART naïve and 50 HAART treated subjects] were enrolled in the study. Plasma creatinine, urea, uric acid, myoglobin and urine microalbumin were assayed using standard methods.
Results: Microalbuminuria was significantly higher ($p< 0.001$) in HIV positive than HIV negative subjects, while the differences in the levels of urea, creatinine, uric acid and myoglobin were insignificant. The levels of urea ($p< 0.001$), creatinine ($p< 0.018$) and uric acid ($p< 0.001$) were significantly higher in HIV positive HAART naïve than HIV positive on HAART. Even though the levels of microalbuminuria were higher while myoglobin was lower in HIV positive HAART naïve than HIV positive on HAART, the difference was not statistically significant.
Conclusions and Recommendations: The levels of measured markers of renal function were higher in HIV positive subjects whether or not on HAART treatment. However, HAART treatment did not adversely affect renal function in this study, but subjects on long-term treatment with HAART may be routinely monitored to ensure that renal impairment is detected early among HIV-1 positive subjects.

FRPEA001

Laboratory Capacity Strengthening for Conducting HIV Vaccine Clinical Trials in Eastern and Southern Africa

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Background: Conducting successful HIV vaccine clinical trials in resource-limited settings can be hampered by lack of adequate laboratory capacity at trial sites poor infrastructure, lack of well-trained technical personnel, and inadequate laboratory quality management Systems.
Methods: IAVI established a laboratory support program that provides capacity development and support for immunology and clinical safety testing at 9 clinical research centers (CRC) site laboratories in Eastern and Southern Africa region from 2001 to date. The capacity building functions included: Accreditation, training in scientific and technical skills, provision of research infrastructure, external quality assurance (EQA) program, equipment service and maintenance. Integral to this program is IAVI's Human Immunology Laboratory (HIL) at Imperial college in London, UK which provides services including external immunology testing, assay development and technology transfer, sample management, reagent distribution, training and technical audits
Results: The IAVI partner CRCs (n=9, 100%) laboratories received Good Clinical Laboratory Practice (GCLP) accreditation between 2004 and 2018, and accreditation maintained annually. Over the same period, IAVI successfully trained a total of 1628 individual on GCLP (n=959, 59%), and on specific laboratory techniques (n=669, 41%).In addition, 86 individuals have been registered on a competency assessment e-learning platform across the CRCs. All the safety assays were registered in the EQA programs. i.e. College of American pathologist (CAP) 53% (n=10) and the Royal college of pathologists of Australasia (RCPA) 47% (n=9) EQA programs. The 4 renovated labs and other CRCs have been refurbished with testing and cryogenic equipment.
Conclusions and Recommendations: The IAVI CRCs conducted 27 clinical trials and 19 epidemiological studies, allowing them to leverage further funding for clinical trial research and establish themselves as centres of excellence in the region. It also led to development of the largest acute infection cohort in Africa that found HIV disease progression/viral control varied by region, the emergence of broadly neutralizing antibody (bnAb) responses approximately 3 years after acute infection and establishment of laboratory reference range among African population

FRPEA002

Assessment of Anemia in HIV Person at Kigali University Teaching Hospital (KUTH/CHUK) HIV Clinic

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Background: Anemia has been an important clinical problem in patients infected with HIV and those with AIDS. Since first report of HIV/AIDS, hematological complications have been manifested until now, anemia has been more common than other cytopenia. I aim at determining; risk factors, management and outcomes of anemia.
Methods: A descriptive retrospective study for two years (January 2015-January 2017) at CHUK/KUTH HIV clinic. Anemia defined according to WHO for both men and women. CD4 cells count, opportunistic infections and other comorbidities were taken into account. The Chi-square test use for statistical significant, potential risk factors for anemia were identified in univariate analyses and evaluated in separate multivariable models.
Results: A total of 250 HIV persons, 89(35.6%) were men and 161(64.4%)were women. The overall prevalence of anemia (Hb ≤12g/dL) was 75(30%) ($p< 0.001$). The mean ±SD hemoglobin level of 13.028±2.16. Anemia in men was 25(27.8%) in women was 65(34.4%). Risk factors for anemia were underweight ($p< 0.001$), being HAART naïve $p=0.02$, ZDV use $p< 0.05$, oral candidiasis $p=0.04$.
In management: continuing HAART and bactrim 120(48%), starting HAART and Bactrim for no use HIV person noted 89(35.6%), iron supplement 8(3.2%).
For outcomes in anemic persons: increase CD4 cells count 58(30.4%), no response to initiated management 1(14,7%), increase to normal Hb in general 8(10.7%),death 3(4%), increase Hb and CD4 cell count 1(1.3%).
Conclusions and Recommendations: Anemia continue to be a burden in HIV infection. Anemia is associated with nutrition status, opportunistic infections and other comorbidities. There is significant anemia development, outcomes between men and women. Need of national assessment of anemia in HIV person and initiation of clinical guideline on anemia prevention in HIV person.

FRPEA003

Correlation between the Immuno-virological Response and the Nutritional Profile among Treatment-experienced HIV-infected Patients in the East Region of Cameroon

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Background: In resource-limited settings, management of HIV remains challenging, especially in the frame of comorbidities such as malnutrition. Despite access to antiretroviral therapy (ART) in Cameroon, malnutrition persists (14.1%) as a driven factor of disease progression among people living with HIV (PLHIV), without knowledge on specific nutrient impairment for corrective measures. In this prospect, we aimed at evaluating the correlation between the immuno-virological response and the nutritional profile of ART-experienced PLHIV.
Methods: A cross-sectional study was conducted from October to December 2018 among consenting PLHIV enrolled in 02 health facilities in the East-Cameroon. A standard questionnaire was administered to all participants covering socio-demographic and medical data. Blood samples were collected by venepuncture for biological analysis: HIV-1 viral load by Abbott m2000RT apparatus; CD4 and CD8 T cells measurement by BD FACS Calibur apparatus; Full Blood Count by Sysmex XN-1000 Analyzer and biochemical analysis by BT-3000 Plus device. Statistical analyses were performed using R.version3.5.0 and Graph Pad Prism version6.0; with p-value < 0.05 considered statistically significant.
Results: A total of 146 participants were enrolled (median age: 42 [IQR: 33-51] years, 76% were female and median duration on ART: 54 [IQR: 28-86] months). Of these participants, 17% were malnourished based on the body mass index < 18.5 and 5% were at the stage of advanced weight loss. 44% were immunodeficient (CD4+ counts < 500 cell/µl) and 76% had an undetectable viremia (< 1.60 log10 RNA/ml). Regarding the immunological response, a negatively weak correlation was found between total protein concentration and CD4 (r=-0.18; p=0.03), as well as with CD4/CD8 ratio (r=-0.27; p=0.0009). Regarding the virological response, an inversely significant correlation was found with viremia (r=-0.65; p=0.001) and a positively weak correlation between triglycerides and viremia (r=0,27; p=0,07).
Conclusions and Recommendations: In a nutshell, after 5 years on ART, less than 20% of PLHIV suffer from malnutrition, almost half remain immunocompromised, while 3/4 are in absolute control of viral replication. In routine clinical practice, this good virological response would reflect nutritionally an increase in total cholesterol and a decrease in triglycerides, suggesting to investigate the type of cholesterol incriminated.

PLHIV, Nutrition, CD4, Viremia, ART

FRPEA004

Diagnostic Accuracy of VISITECT Semi-quantitative CD4 Rapid Test for Advanced HIV Disease Screening

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Background: In sub-Saharan Africa, 20%-25% of people starting antiretroviral therapy (ART) or returning to care, present with Advanced HIV Disease (ADH), (CD4< 200cells/mm3 or WHO stage 3 or 4 disease) and approximately 10% die within 3 months. Decentralizable and affordable instrument free Point-Of-Care (POC) diagnostics are required to increase access to prompt CD4 cell screening among patients suspected of AHD, so as to trigger further AHD diagnostic tests (urine TB LAM and Cryptococcus Antigen tests). The VISITECT® CD4 Lateral Flow Assay (Visitect CD4 LFA) is the first-ever instrument-free point-of-care CD4 test with results interpreted visually after 40 minutes, providing a result of above or below 200 CD4 cells/mm3. Diagnostic accuracy of the Visitect LFA is being evaluated in DRC, Zimbabwe and Malawi.

Methods: Patients eligible for CD4 cell count test and above 18years of age, are being enrolled within three MSF supported health facilities of Gutu Mission Hospital, GMH (Zimbabwe), Nsanje District hospital, NDH (Malawi) and CHK tertiary referral (DRC). An estimated 800 venous EDTA blood samples will be tested in the index test and in the BD FACSCount assay (reference test) in the laboratories of the study sites. A further 620 capillary samples will be tested on the index test and on the PIMA at POC by clinicians, to assess feasibility of use.

Results: A total of 533/800 patients have been enrolled into the study so far (85% from DRC and 15% from Malawi). Overall median age is 42 years [IQR: 34-50], 68% are female and median CD4 cell count is 275 cells/mm3. Of the 191/533 samples with CD4 < 200cells/mm3 on the reference test, 180 (94%) had CD4 < 200cells/mm3 on Visitect LFA, whereas of the 342/533 samples with CD4 >200cells/mm3 on the reference test, 274 (80.1%) had CD4 >200cells/mm3 on the Visitect LFA. A total of 11/191 (5.8%) and 68/342 (19.9%) were misclassified as having CD4 < 200cells/mm3 and CD4 >200cell/mm3 respectively by the Visitect LFA. The sensitivity of Visitect LFA was 94.2% [95% CI: 89.9-97.1] and specificity was 80.1% [95% CI: 75.5-84.2].

Conclusions: Visitect LFA is a promising test for decentralized CD4 screening in resource-limited settings, especially within Primary Health Clinics (PHCs) with no access to laboratories or POC CD4 devices and it can also trigger prompt management of patients suspected of AHD. However, a Negative Visitect test (CD4>200cells/mm^3) mustn't exclude further patient assessments.

FRPEA005

Feasibility of VISITECT Semi-quantitative CD4 RapidTest for Advanced HIV Disease Screening at Point-of-Care

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Background: Despite progress in antiretroviral therapy (ART) scale-up, nearly a third people starting ART or returning to care, present with Advanced HIV Disease (ADH), and approximately 10% die within 3 months. Decentralizable and affordable instrument free Point-Of-Care (POC) diagnostics are required to increase access to prompt CD4 cell screening among patients suspected of AHD. The VISITECT® CD4 is the first-ever instrument-free point-of-care CD4 test with results interpreted visually after 40 minutes, providing a result of above or below 200 CD4 cells/mm^3. This is a descriptive analysis of the feasibility and ease-of- use of the index test at bed-site in DRC, Zimbabwe and Malawi.
Methods: As part of a large multi-country Visitect CD4 LFA diagnostic accuracy study, this feasibility assessment involved issuing self-completed semi-structured questionnaires to laboratory technicians, nurses and doctors involved in using the index test at POC among consenting patients within the 3 MSF supported health facilities of Gutu Mission Hospital, GMH (Zimbabwe), Nsanje District hospital, NDH (Malawi) and CHK tertiary referral (DRC). A finger prick test was done on the PIMA CD4 and on the Visitect CD4 LFA at POC. Data was transcribed and analyzed in excel.
Results: After conducting a median of 10 tests [IQR: 6 - 14], a total of 8 lab techs, 6 doctors and 10 nurses, felt confident in conducting the Visitect CD4 LFA and overall usability was high across the study sites with over 96% successful test completion rate. However, HCWs were more comfortable to interpret test results next to life size examples of possible test outcomes in pictorial result depictions. During their routine multi-tasking activities, doctors and nurses (11/16, 69%) found it difficult to manage the precisely timed multiple incubation steps (at 3 minutes, then 17 minutes and 20 minutes) with dual buffer additions in different wells. However, this was less felt so by lab technicians.
Conclusions: Given the need for precise incubation and timing steps, a specific lay cadre maybe needed for such a test and to better streamline many other POC tests (CrAg, urine TB LAM) which have been under-utilized in many PHC, especially as nursing staff are often overburdened with work. The lay cadre will also be responsible for all POC testing quality assurance, reflex testing, POC testing data management, stock management and linking to labs, among other roles.

FRPEA006

HIV-1 Viral Load Quantification Using Aptima HIV-1 Quant Dx Assay in Kenya: A Diagnostic Accuracy Study

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Background: Accurate quantitation of HIV-RNA (viral load) is critically significant for diagnosis, treatment, monitoring and assessment of HIV-1 infection. The choice of assay platform is very important in influencing treatment decisions of HIV patients. This study is important to determine the diagnostic accuracy of the new assay to be used in Kenya and other low- and middle-income countries.
Objectives: To evaluate viral load diagnostic accuracy of Aptima HIV-1 Quant Dx assay in HIV-positive people on antiretroviral therapy.
Methods: The performance of the Aptima assay was compared against the Roche COBAS® AmpliPrep/COBAS® TaqMan® HIV-1 Version 2.0 (CAP/CTM) assay. The analytical sensitivity, specificity, diagnostic agreement with CAP/CTM, carryover contamination and precision of Aptima HIV-1 assay was analyzed using 219 HIV positive viral load remnant samples. Sensitivity of Aptima and CAP/CTM was assessed using clinical specimens from HIV-1 patients on antiretroviral therapy (ART) with quantifiable results. Aptima assay specificity was determined using individual donor 40 HIV-1 seronegative plasma specimens. Linearity and accuracy of quantitation was assessed using clinical specimens ranging in concentration from 1.0-7.0 $\log_{10}$ copies/mL. A method comparison was performed and Bland Altman analysis was used to analyze the level of agreement between the two assays.
Results: Analytical sensitivity of Aptima HIV-1 assay using clinical samples was 99.1% (95% CI: 95.3%-100.0%). Using the 40 HIV-1 negative plasma specimens, all results were negative (specificity of 100%: 95% CI: 99.4-100%). High pearson correlation ($r>0.92$) and excellent agreement was observed between Aptima HIV-1 assay and CAP/CTM. Aptima's precision as per the coefficient of variation was less than 3%.
Conclusions: The Aptima® HIV-1 Quant Dx Assay demonstrated good sensitivity, specificity, linearity and diagnostic agreement with the Roche COBAS® AmpliPrep/COBAS® TaqMan® HIV-1 Test v2.0. The Aptima® HIV-1 Quant assay on the Panther system is a suitable platform for detecting and monitoring HIV-1 viral load in HIV-1 infected patients in Kenya. This will increase access of HIV viral load tests for people living with HIV thus contributing to HIV treatment management.

FRPEA007

Décentralisation du Diagnostic et du Suivi Virologique du VIH au Sénégal: Impact des Point-of-Care

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Contexte: Au Sénégal, 7 enfants sur 10 ne sont pas diagnostiqués et seulement 17% ont eu à bénéficier d´une mesure de la Charge Virale (CV) et ceci malgré l'existence de 21 plateformes conventionnelles pour la mesure de la CV et 4 plateformes qui font le dépistage précoce des enfants (DP). L'utilisation des laboratoires centralisés pour les tests de DP et la mesure de la CV du VIH entraine un long délai de transport, de rendu des résultats et de prise en charge clinique des patients. Le Sénégal s'est donc engagé dans la décentralisation du DP et de la CV à travers le projet « Point-of-Care » (POC) qui consiste à optimiser les GeneXpert (Cepheid) pour le VIH1 et à mettre à disposition des m-PIMA (Abbott) pour le VIH1 et VIH2 au niveau sud du pays.
Objectif: Cette étude visait à définir l'apport des POC dans le DP des enfants et la mesure de la CV au niveau décentralisé à travers la phase pilote du projet POC.
Méthodologie: Des études rétrospectives et prospectives ont été réalisées dans 8 sites pilotes. La population d'étude était constituée de nourrissons nés de mères séropositives dits enfants exposés au VIH à partir de 6 semaines de vie et de personnes vivant avec le VIH ayant besoin d'un test CV pour le suivi au 6ème mois de mise sous ARV ou lors de leur suivi annuel. Les données ont été obtenues à partir des registres des structures de santé et ont été collectées en utilisant l'application SurveyCTO. Une comparaison de la mesure de la CV et du DP pré et mi-POC a été faite pour les périodes de mai - juillet 2018 et mai - juillet 2019. La phase pilote va être menée durant la période de mars 2019 à octobre 2019.
Résultats: Les résultats des sites pilotes ont montré un accès faible aux tests de CV et DP en période pré-POC avec un taux de réalisation des tests demandés de 68% (CV) et 34% (DP). Les résultats provisoires montrent que ce taux est >95% (mi-POC). Le temps de rendu des résultats est passé de >35 jours (pré-POC) à < 24h (Mi-POC). Parmi les patients présentant une CV >1000 copies/ml (36% en pré-POC et 20,9% en Mi-POC), le délai médian pour obtenir un conseil sur l'adhérence a été réduit de 30 jours (pré-POC) à environ 1 à 3 jours.
Conclusion: L'utilisation des POC au niveau décentralisé améliore le taux de réalisation des tests du VIH, le temps de rendu des résultats DP et CV, permettant ainsi une meilleure prise en charge clinique des patients.
Mots-clés: POC, Charge Virale, Diagnostic précoce, décentralisation, Sénégal

FRPEA008

Rapid Test Continuous Quality Improvement (RTCQI): Improvement of Quality Practices within HIV Testing Sites in Malawi

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Issues: Malawi AIDS Counseling and Resource Organisation (MACRO) is currently rolling out the RTCQI: site and personnel certification framework. The initiative is aiming at improving the quality of HIV test results as per WHO guidelines to ensure reliable and accurate testing in all the testing points in the country.
Description: In July 2016, Ministry of Health in collaboration with MACRO organized a meeting with the aim of developing a Malawi rapid HIV testing: provider and site certification framework draft. The meeting aimed at comparing the draft frame work with Malawi HTS guidelines and the WHO Framework to ensure the documents were aligned. In August, 2017 the certification framework was approved by the country's Ministry of Health and included in the HIV Testing Skills Intensive training curriculum. The roll out has started with five (5) districts of Mangochi, Ntcheu, Dowa, Machinga, and Zomba. The key RTCQI pillars such as logbook data analysis, support in corrective actions after rounds of proficiency testing and human resource development are included in the implementation.
Lessons learned: MACRO in collaboration with Ministry of Health successfully formulated the HIV site and personnel certification framework to roll out the RTCQI certification program in HIV testing sites. To support the implementation, 42 SPI-RT site auditors and 33 personnel competency assessors were trained prior to implementation to assist in site and provider certification in the key districts. During the initial assessments of 180 sites only 29 sites attained level 4 of the SPI-RT checklist representing 16.1% performance rate and 13 sites were certified by Medical Council of Malawi representing 44.8% of the sites at Level 4 which were recommended for certification.
Next steps: Collaborative effort from both stakeholders, key implementing partners is fundamental during the rolling out phase implementation of RTCQI certification initiative. Results from the initial site audits highlighted critical challenges and the urgent need to implement interventions that ensure quality at every testing site.

FRPEA009

Performance Characteristics of GenXpert and Alere Q Point of Care Technologies for HIV Early Infant Diagnosis in Kenya

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Background: In Kenya, early infant HIV diagnosis (EID) among HIV exposed infants(HEIs)is achieved through centralized testing using dried blood spots (DBS). However, only 67% of HEIs accessed EID testing in the first half of 2017, suggesting suboptimal performance of the centralized testing system in meeting EID testing demand.Point of care technologies (POCT)could potentially increase accessibility to EID due to their proximity to the clinics and shortened turn-around time of EID results. We describe performance characteristics of GeneXpertHIV-1 and Alere Q HIV 1/2as EID POCT in Kenya.
Methods: Whole blood was collected from 200 HEIs attending Kenyatta National Hospital (KNH) elimination of mother to child HIV transmission clinic between June2017 to August 2017. EID testing was conducted on Alere-Q HIV-1/2 and GeneXpert HIV-1 POCTs as well as on Roche CAP-CTM HIV-1 V.2 assay (gold standard). Data was analyzed for sensitivity, specificity, error rates and overall test agreement using SAS version 9.4.
Results: Of the 200 samples, 102/105 tested positive on Alere-Q and 104/105 on GeneXpert. Alere-Q and GeneXpert achieved a sensitivity of 97.1% (95% CI: 93.6% - 100%) and 99.1% (95% CI 95.8% - 100%)) with a specificity of 100% (95% CI: 96.1% - 100%) and 98.9% (95%CI 94.7 - 100%) respectively. The PPV for Alere Q and GeneXpert was 100% and 98.9%, while the NPV was 96.9% and 99.1% respectively. In comparison to Roche, test agreement kappa value was 0.967 for Alere Q and 0.988 for GeneXpert. The equipment reported an uninterpretable error rate of 6% and 2% for Alere-Q and GeneXpert respectively
Conclusions and Recommendations: Alere Q HIV-1/2 and GeneXpert HIV-1 EID POCT had excellent test agreement with Roche CAP-CTM HIV-1 V.2 assay and therefore suitable to complement the existing centralized testing system, especially in hard to reach areas. Evaluation of long-term cost-effectiveness and monitoring of error rates are recommended before full-blown scale-up.

FRPEA010

Analytical Performances of Capillary Blood-based Exacto® HIV Self-test in Central African Republic

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Background: Opportunities for HIV testing could be enhanced by offering HIV self-testing in general profane population and in those (FSW, MSM, adolescents) that fear stigma and discrimination. Recently, the CE-IVD marked capillary blood Exacto® HIV self-test (Biosynex, Strasbourg, France) showed high usability according to WHO technical recommendations in profane adults living in Bangui, Central African Republic (CAR) (*Grésenguet et al., Open AIDS J 2017;11:101*), with satisfactory success rates of interpretation performances, demonstrating its potential for use by the general public. However, the virological performances of the HIV self-test must be evaluated in the field before use because the risk of false negative or positive results in HIV testing is considered to be high in Central Equatorial Africa. We herein evaluated the virological analytical performances of the Exacto® HIV self-test in the CAR.
Methods: A cross-sectional study was conducted on prospective panel of 299 sera from adult inpatients living in Bangui, including 199 sera positive for HIV and 100 negative for HIV, according to reference serological immune-enzymatic assays. Serum samples were tested blindly in duplicate.
Results: The Exacto® Test HIV self-test provided 100 (100.0%) true HIV-negative sera and 198 (99.5%) HIV-positive sera, including one (0.50%) false-negative serum. The Exacto® Test HIV self-test showed 99.5% (95% CI; 98.5-100.0) sensitivity (Se) and 100.0% (95% CI; 99.9-100.0) specificity (Sp). The Youden's J (J=sensitivity+specificity−1) index [for accuracy assessment] and Cohen's kappa coefficient [for concordance with reference results] were 0.99. At HIV seroprevalence of 4.0% in the general adult (15-49 years) population of the CAR (2017), the positive predictive value (PPV) was 100.0% (95% CI; 99.9-100.0) and the negative predictive value (NPV) was 100.0% (95% CI; 99.7-100.0), according to Bayes' formula.
Conclusions and Recommendations: The sensitivity and specificity of the Exacto® HIV self-test were both ≥99.0%. The J index and Cohen's kappa coefficient close to 1.0 demonstrated high reliability to diagnose HIV infection. The analytical performances of the HIV self-test in the field conditions of the CAR, which constitutes an area of circulating HIV-1 strains with broad genetic diversity, are within the limits required by the WHO (*i.e.* sensitivity≥99.0% and specificity≥98.0%), making the CE-IVD marked Exacto® Test HIV self-test suitable for routine use in the CAR.

FRPEA011

Analytical Performances of Exacto® Triplex Rapid Test for HIV/HCV/HBsAg in Central African Republic

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Background: Multiplex rapid diagnostic test (RDT) for HIV, HCV and HBV may be advantageous in maximizing resources as these diseases share common risk factors and transmission modes. We herein evaluated the analytical performances of the Exacto® Triplex HIV/HCV/HBsAg (Biosynex, Strasbourg, France) for HIV- and HCV- antibodies (Ab) and HBV surface antigen (HBsAg) in Central African Republic (CAR).
Methods: A cross-sectional study was conducted on prospective panel of 450 sera from adult inpatients living in Bangui, including 200 positive for HIV Ab, 50 for HCV Ab, 100 for HBsAg and 100 negative for HIV-/HCV- Ab and HBsAg, according to reference assays. Sera were tested blindly in duplicate.
Results: The Exacto® Triplex provided 100 (100.0%) true HIV-negative sera and 199 (99.5%) HIV-positive sera, including one (0.50%) false-negative serum; 100 (100.0%) true HCV-negative sera and 48 (96.0%) HCV-positive sera; and 100 (100.0%) true HBsAg-negative sera and 99 (99.0%) HBsAg-positive sera. For HIV infection, the Exacto® Triplex showed 99.5% (95% CI; 98.5-100.0) sensitivity (Se) and 100.0% (95% CI; 99.9-100.0) specificity (Sp). The Youden's J (J=sensitivity+specificity−1) index [for accuracy assessment] and Cohen's kappa coefficient [for concordance with reference results] were 0.99. At HIV seroprevalence of 4.0% in the CAR, the positive predictive value (PPV) was 100.0% (95% CI; 99.9-100.0) and the negative predictive value (NPV) was 100.0% (95% CI; 99.7-100.0). For HCV infection, the Triplex showed 96.0% (95% CI; 90.6-100.0) Se and 100.0% (95% CI; 99.9-100.0) Sp. The J index and kappa coefficient were 0.96 and 0.97, respectively. At HCV national seroprevalence of 3.0%, the PPV was 100.0% (95% CI; 99.9-100.0) and the NPV was 99.0% (95% CI; 99.2-100.0). For chronic HBV infection (HBsAg), the Triplex showed 99.0% (95% CI; 97.1-100.0) Se and 100.0% (95% CI; 99.9-100.0) Sp. The J index and kappa coefficient were 0.99. At chronic HBV national seroprevalence of 15.0%, the PPV was 100.0% (95% CI; 99.9-100.0) and the NPV was 99.8% (95% CI; 99.0-100.0).
Conclusions and Recommendations: The Exacto® Triplex showed high sensitivity and specificity for HIV, HCV and HBsAg, excellent reliability to reference results with high accuracy and concordance, and elevated PPV and NPV for the three chronic viral infections, making the Triplex suitable for routine use in the CAR in order improve the "cascade of screening" and quite possibly linkage-to-care with reduced cost.

FRPEA012

Comparing Demand for Laboratory-based and Point-of-Care Early Infant HIV Diagnosis Across Different Health Care Settings in Eswatini, Kenya and Zimbabwe

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Background: Most HIV-exposed infants (HEI) present for early infant diagnosis of HIV (EID) testing through prevention of mother to child transmission (PMTCT) services, but HEI may present to non-PMTCT settings. Data suggests that HEI presenting to non-PMTCT settings have a higher risk of being HIV-infected. As many HEI presenting to non-PMTCT settings are not in longitudinal care, referral laboratory-based EID, with long turn-around-times to results, may not be optimal. Point-of-care (POC) EID may improve access to EID for non-PMTCT settings. An evaluation in Eswatini, Kenya and Zimbabwe compared the proportion of EID tests from non-PMTCT settings before and after POC EID.
Methods: Pre-intervention data were collected at health facility registers for HEI with samples sent for referral lab EID between March 2014 and December 2016 in sites that later implemented POC-EID. Post-intervention data were collected between December 2016 and April 2019 for HEI tested with POC EID. We collected data on numbers of HEI tested in PMTCT and non-PMTCT settings (outpatient, inpatient, nutrition and emergency wards), test results and ART initiation. The proportions of EID testing at PMTCT and non-PMTCT settings were compared pre- and post-POC EID using Pearson Chi square tests. Descriptive statistics were used for other analyses
Results: 1153 children and 8319 children in 43 sites tested with referral lab-based and POC EID, respectively. There was a significant increase in the proportion of infants tested with POC in non-PMTCT settings as compared to referral lab-based EID (7.5% vs. 3.2%, $p< 0.001$). The positivity rate was significantly higher in non-PMTCT compared to PMTCT settings, irrespective of testing technology (POC: 9.18% (95% CI: 7.02-11.7) vs 2.96% (95% CI: 2.59-3.36); Lab: 13.1% (95% CI: 4.44-2.80) vs 4.48% (95% CI: 3.34-5.86)). Among HIV-infected infants identified in non-PMTCT settings, 80% and 81% initiated on treatment after testing with referral lab and POC EID, respectively
Conclusions and Recommendations: The proportional demand for EID in non-PMTCT settings increased after introduction of POC EID. This may be due to rapid test result access for clinicians caring for children in short-term settings without defined follow-up and/or due to trainings provided as a part of POC EID introduction. POC EID can be an important tool to increase the identification HIV-infected infants in non-PMTCT settings, and facilitate quicker HIV-treatment initiation.

FRPEA013

Introducing Routine Point-of-Care Early Infant Diagnosis in Eight African Countries: Outcomes from Interviews with Clinical and Laboratory Personnel

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Background: EGPAF introduced point-of-care (POC) for early infant diagnosis (EID) for HIV in Cameroon, Côte d'Ivoire, Eswatini, Kenya, Lesotho, Mozambique, Rwanda, and Zimbabwe. We conducted interviews with health care workers (HCWs) and laboratory managers using POC platforms to understand their experience and opinions before and after introduction of POC EID

Methods: Data from questionnaires with HCWs providing EID services and in-depth interviews (IDIs) with lab managers were collected before and after the implementation of POC EID in a convenience sample of intervention sites. We conducted 234 questionnaires with HCWs and 28 IDIs with lab managers prior to the start of POC EID and 175 questionnaires with HCWs and 11 IDIs with lab managers after the implementation of POC EID. We analyzed the interviews, identifying codes, building categories, and identifying common themes within and across countries around the perceived challenges and facilitators to EID

Results: Pre-intervention interviews identified challenges with lab-based EID testing including distance from patients to the health facility, time-consuming sample transportation, stock out of test kits and long wait times for results. While POC EID was identified as one strategy to improve EID, participants also described the need to strengthen a larger EID system. Lab managers hesitated to fully endorse POC EID due to trust issues around the reliability of results and many requested pilot phase data before committing to endorsing scale-up of POC EID

Post-intervention data revealed that HCWs found POC EID easy to use and were very satisfied with the fast turnaround times (TAT), requiring fewer client visits and the ability to initiate HIV-infected infants on treatment sooner. Lab managers supported scaling-up POC and were impressed with the improved TAT yet cautious of the need for both reliable internet and batteries to operate platforms. Lab managers understood the need of ensuring a sufficient number of trained health care worker able to operate the platforms and the need for strategic placement of platforms (high volume vs. hard to reach facilities)

Conclusions and Recommendations: Support for POC EID from key stakeholders is essential for the sustainability of the intervention and for good service delivery. Overall, participants supported the rollout of HIV POC EID. Data revealed important challenges and opportunities that can help scale-up POC EID in country but also strengthen the overall EID system

FRPEA014

A New Portable Point of Care Device for the Determination of CD4 T Cells and Hemoglobin: FACS Presto

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Background: CD4 measurement is a critical parameter in predicting the eligibility of treatment towards HIV/AIDS drug therapy as well as in the monitoring treatment process. With the limitations in developing countries, low cost accurate and precise test has to be used effectively to tackle the morbidity and mortality rate among HIV/AIDS patients. This study aimed to evaluated the efficacity of FACS Presto on measuring CD4 and hemoglobin against and FACS Calibur as a golden standard for CD4 and Sysmex sx 500i for hemoglobin.

Methods: For CD4, routine collected blood samples were performed on FACS Calibur, PIMA and FACS Presto, while, Sysmex sx 500i, Hemocue and FACS Presto were used for Hb level measurement in a cross sectional study conducted at Rwanda National Reference Laboratory. The mean biases were determined using a paired student's t-test. Bland-Altman plot was used to assess agreement, and the sensitivity, specificity, and predictive values were determined for the measurements of the variables using different methods.

Results: Out of 379 participants 49.6% were recruited from urban while 50.4% were from the para urban setting, for the median age of our recruited participant were 35 with IQR (26-43), 44.83 % were male while female account for 55.17%. Following the analysis, the Pearson's correlation between FACS Presto and FACS Calibur showed a high correlation ($R^2=0.8620$, P-value < 0.001) for CD4 measurement, which is closest to the analysis of Pima and FACS Calibur ($R^2=0.8756$, P-value < 0.001). However, the mean differences revealed a high contrast between FACS Presto and FACS Calibur with 51.75 cells/ml (95% CI: 35.15, 68.36) compared to 2.05 cells/ml (95%CI -20.33, 24.44) observed on the comparison between PIMA and FACS Calibur. Referring to FACS Calibur, for CD4 measurement, PIMA showed a high overall agreement on all cut off (100, 350, and 500 cells/ml) compared to FACS Presto. The mean difference for Hb level measurement using FACS Presto and Sysmex i500 was -0.61 (95% CI: -0.76, -0.46). There was no agreement between FACS Presto and Sysmex i500 on the cutoff of 17g/dl.

Conclusions and Recommendations: FACS Presto can be used as an alternative device for measuring CD4 and Hb levels, particularly in resource limited settings. Further study is recommended for the cost-effectiveness analysis.

FRPEA015

HIV Re-testing Prior to ART Initiation in the Context of Treat All at Mpilo Opportunistic Infections Clinic, Bulawayo, Zimbabwe

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Issues: The World Health Organization (WHO) Treat All recommendation was accompanied with another recommendation to re-test prior to initiation on Antiretroviral Therapy (ART). Zimbabwe adapted these guidelines in December 2016 but Mpilo Central Hospital Opportunistic Infections Clinic had already begun implementation of both recommendations as a pilot site in November 2016.

Descriptions: All registered pre-ART clients were contacted to come for ART initiation. Before initiation the patients were re-tested for HIV using the national HIV testing algorithm. All clients with a positive result were initiated on ART as per national guidelines whilst all clients with a negative result upon retesting were then re-tested using the same test but by another provider. If the result of the re-test was negative, the clients were referred for further confirmation using DNA PCR test.

Lessons learned: Between December 2016 and May 2018, 207 pre-ART registered clients were re-tested prior to ART initiation 41% of whom were children below 14 years and 58% were females. 16/207 (7.7%) had negative results and this was confirmed by a test with a different provider. 12/16 were referred for DNA PCR and were all negative. The median age of the 16 clients at time of initial HIV diagnosis and at retesting were 13.5 years (Q1=10; Q3=37) and 16 years (Q1=1.00; Q3= 43.00) respectively. 7/16 were enrolled as exposed infants with 4/7 aged less than 18 months but only one had DNA PCR test done before 18 months. Four of the 16 clients did not have a documented result of the initial HIV test at registration. The median CD4 count at retest was 953 cell/cm3 (Q1=789; Q3 = 1145) and 10/16 had been on pre-ART for more than 5 years. 6/16 reported illness and hospitalization at the time of initial HIV test and all the clients had been on Cotrimoxazole prophylaxis with one client on dapsone after reacting to Cotrimoxazole.

Next steps: The recommendation to re-test before ART Initiation should be fully embraced in HIV programs together with the Treat All recommendation and more focus should be put on clients who have been on Pre-ART for long periods without opportunistic infections and with persistently high CD4 counts. Accurate documentation of HIV test results should be strengthened within the program to minimise misclassification of clients. The service providers should ensure that all children below 18 months of age are diagnosed by DNA PCR and the program should ensure access to the services.

FRPEA016

Doing HIV Index Testing Differently: A Health Education Approach to Get Returning Clients and Those Newly Initiating Antiretroviral Therapy Effectively Participate

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Background: HIV Index testing (IT) remains the hallmark strategy for case identification. Its uptake and effectiveness depends on the accuracy of the contact information elicited to the service provider (SP) by the index case (IC) especially information on sexual contacts. Sexual issues in our context are sensitive thus people are reluctant volunteering information about their sexual contacts. In some instances clients provide SPs with wrong information making it difficult to reach and provide contacts with IT services. We share the lessons learned from implementing a novel strategy in the South West Region of Cameroon. Here clients were progressively provided with IT information that enabled them volunteered accurate contact information with which SPs could effectively reach and provide their sexual contacts, biological children and acquaintances (relatives, friends, neighbours etc.) with IT services.
Description: We implemented this strategy between October 2018 and June 2019 in 14 sites. A health education package was provided to clients during ART initiation and follow up visits in either group or individual sessions. The content of the health education included; (1) modes of HIV transmission (2) modes of action of ARVs and its effects on HIV transmission, (3) social responsibility of IT in reducing morbidity, mortality, overall HIV transmission, (4) a contract letting the IC understand issues of confidentiality and that HIV status of contacts can't be shared. We compared IT uptake, yield and linkage to ART at these sites to the overall IT yield and ART uptake of the region.
Results and lesson learned: A total of 1,617 ICs were identified, from which 2,228 contact persons were enlisted and notified. Of these, 2,171 tested for HIV with 470 identified HIV positive, giving a yield of 21.6%. This yield was significantly higher than the overall IT yield of 13.4% for the same period for other sites. The ART uptake of 95% from this strategy was much higher than the 89% overall linkage from IT. We learned three main lessons implementing this strategy. Firstly, clients provided more accurate and updated information on their sexual contacts. Secondly, most ICs readily guided SPs to reach their contacts. Lastly, some clients who did not readily provide information about their sexual contacts, indirectly did so through acquaintances.
Conclusions: The health education approach has the potential to improve IT uptake, yield and linkage to ART.

FRPEA017

Increasing HIV Case Finding through HIV Self-testing in Lusaka, Zambia

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Background: HIV self-testing (HIVST) is a vital strategy for attaining UNAIDS 90-90-90 goals by reaching the unreached populations such as men, young people and key populations. ZAMPHIA 2017 reports status on UNAIDS 90-90-90 goals for Zambia as 67.3%-85.4%-89.2% respectively. Society for Family (SFH) implements diverse models to distribute HIV self-test kits to target populations. The models of distribution are community led, out-patient department (OPD), secondary distribution and key population peer-led. In order to determine if HIVST increases case finding of newly diagnosed HIV positives, SFH conducted a study in three Lusaka district health facilities-Chelstone clinic, George Clinic and Matero 1st Level Hospital.
Methods: The study took place in September, 2018. Six clinicians were trained on how to provide information and distribute the Oraquick HIVST kits. All clients during counseling were given the option to test using Provider Initiated Testing Counselling (PITC) or HIVST. Those who accepted a HIVST kit were encouraged to test within the clinic premises and report the result. Data was collected using a client intake form administered by the clinicians. In addition, routine HMIS data on number of positive cases identified was used to assess the impact of the implementation of HIVST in Out-patient Department (OPD).
Results: Our data show that 100% of HIVST conducted within the health facility had documented results. Between 1st and 30th September 2018, 2,122 HIVST kits were distributed in OPD, of which 3.9% (82) clients tested positive with 93% (76) were linked to care. Six clients (7%) were not linked to care, of whom, two declined to be linked to care and four did not provide reasons for not being linked to care. Higher HIVST uptake was recorded at Chelstone clinic (58%) compared to George Clinic (39%) and Matero First Level Hospital (7%). Overall, HIVST in OPD contributed 16% of the total 11, 256 from all the testing points in the facilities under the study. During the study period the facilities identified 822 positive cases from all testing points within facilities. Which was 20% higher than the average number (685) of positive cases identified in 12 months before the study period.
Conclusions and Recommendations: Our findings show that implementating HIVST in the OPD can potentially add to increasing number of positive cases identified. There is need to scale-up this intervention and ensure that individuals who attend OPD are offered HIVST.

FRPEA018

The Case for Multiplex Immunochromatographic Rapid Tests Implementation in Sub-Saharan Africa

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Issues: Despite recent advances in the availability of powerful drugs, infectious diseases that are largely treatable continue to take a massive toll on the populations of developing countries. One crucial factor is the lack of diagnostic tests that can be performed at low-infrastructure sites, which serve most of the global population. The recently multiplex immunochromatographic rapid diagnostic tests (RDT) for HIV, HCV, HBV and/or syphilis allow a new approach that could be incorporated into implementation strategies, particularly for use among populations not reached by existing testing options.
Descriptions: For example, the Exacto® HIV/HCV/HBsAg Triplex RDT (Biosynex, Strasbourg, France) consists in manually performed, visually interpreted, simultaneously detecting in 15 min HIV- and HCV-specific antibodies and HBV surface antigen (HBsAg) in serum/plasma and whole blood. The advantages of Triplex include the requirement for less overall specimen volume, fewer finger-sticks if capillary blood is used, cost savings through lower cost per virus tested, improved patient flow with results for multiple viruses available at the same time, overall service delivery efficiencies with less time required per infected patient; patient benefits from fewer visits and lower cost associated with each clinic attendance; and possible use in blood transfusion because the lower limit of HBsAg detection is under the WHO threshold of 4 IU/ml.
Lessons learned: In high risk population for HIV, HCV and HBV, which may be frequently combined, the screening of chronic HIV, HCV and HBV by multiplex HIV/HCV/HBsAg Triplex may clearly improve the "cascade of screening" and quite possibly linkage-to-care with reduced cost. The Triplex has proven its great interest in mass campaigns screening for HIV/HCV and chronic HBV infection in Cameroon, in sexually transmitted infections clinic and HIV care center in the Central African Republic, in gynecology clinic in Chad, and blood transfusion center in the Democratic Republic of the Congo.
Next steps: Several currently however limit access to the diagnostic products that are needed. For numerous multiplex RDT, extraordinary technical hurdles remain to be overcome if broad access is to be provided, such as international and national policies for reagents marking and distribution. Despite these challenges, great strides towards overcoming these obstacles during the next few years are in course, leaving leadership to the African community.

FRPEA019

Same Day HIV-early Infant Diagnosis with SAMBA II Point-of-Care and Rapid Treatment Initiation at Arua Regional Referral Hospital, Uganda

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Background: HIV Early Infant Diagnosis (EID) in Arua Regional Referral Hospital is done in the EMTCT (Elimination of Mother-to-Child Transmission) department by dried blood spots (DBS) sent to the Ugandan Central Public Health (CPHL). In 2017 Médecins Sans Frontières implemented the fully automated SAMBA II (simplified amplification based assay) HIV-1 qualitative whole blood test (results within 2 hours) into the hospital laboratory as an EID Point-of-Care (POC) hub with the aim to increase access to EID beyond the EMTCT department and reduce delay to care.

Methods: Children < 18 months old at risk of HIV infection (HIV-positive mother or status unknown) from different hospital entry points: paediatric-, nutrition- and TB (Tuberculosis) wards, OPD (Outpatient department), EPI (Expanded Program of Immunization), MCH/FP (Mother and Child Health and Family Planning), ENT (Ear Nose and Throat) departments, as well as children residing outside Uganda [Democratic Republic of Congo (DRC) and South Sudan] presenting at the EMTCT department, were tested by POC EID and a parallel DBS EID test at CPHL (external quality control). Testing was repeated for all positive results for confirmation.

Results: Between August 2017 to August 2018, 129 children were HIV-tested. Median age was 3 months (IQR 1.5-6.3), 45% were 6 to 10 weeks old and 55% were males. In total 12.4% (N=16) were confirmed HIV-positive with POC EID. 50% of positive children were residing outside Arua district. Median time from initial positive POC EID to HIV consultation was 0 day (IQR 0-1) and 1 day (IQR 0-6) to HIV treatment start. 43.7 % (7/16) of positive children were identified at the OPD, 18.7% (N=3) at the paediatric ward, 12.5% (N=2) at the EPI and 6.5% (N=1) at each of the remaining entry points: nutrition ward, TB chest clinic, MCH/FP and EMTCT. Two children (12.5%) died and none was lost-to-follow-up prior to ART initiation. SAMBA II results were 100% concordant with DBS results. The average turnaround-time for the reception of confirmatory DBS results from initial POC-EID was 22 days (IQR 16-27). Serology was used for testing 28 children 9 to 18 months old. Results were 100% concordant with the POC-EID.

Conclusions and Recommendations: POC-EID testing allowed same day HIV diagnosis and rapid treatment initiation of infants that had not yet been linked to EMTCT services or came from far. Testing at POC can play a key role in HIV early infant diagnosis in hospital settings.

Keywords: POC, EID, HIV

FRPEA021

Comparing Field Performance of the Alere HIV Combo 4th Generation Kit with the 3rd Generation National HIV Testing Algorithm for Uganda

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Issues: The presence of HIV elicits the production of specific antibodies. The HIV-1 p24 viral capsid is detectable in blood earlier than HIV antibodies during acute infection. It appears early after infection and is typically associated with high viremia and the individual is highly infectious.
Combined antigen and antibody tests provide earlier detection of HIV infection than antibody-only tests. The Alere HIV Combo is an in vitro, visually read, qualitative immunoassay for the detection of antibodies (Ab) to HIV-1 and 2 and the detection of non-immunocomplexed HIV-1 p24 antigen (Ag) in whole blood, plasma or serum. The test is intended for the diagnosis of HIV-1/HIV-2 infection in individuals with recent infection. We studied its performance in Uganda.
Descriptions: In a prospective cohort study between October and December 2017, we compared the Alere HIV combo performance with the national HIV testing algorithms for Uganda. 1001 participants from key population groups were tested for HIV. Discordant samples were sent by DBS to the central lab and retested by an independent technician with DNA PCR as the gold standard. 52.4% of the participants were male. The median age for participants was 26%.
Lessons learned: There was a difference between the test results from the Alere HIV Combo and the national algorithm in terms of Identification. The HIV positivity was higher at 14.1% and 9.5% among female and males respectively compared to the National positivity at 3.2% in 2017. Positivity on the Alere combo was higher at 16% and 12.1% for bar attendants and business people compared to 14% and 11.1% on the National algorithm respectively. The central region registered different positivity for combo at 12.4% from 11.6% on the National algorithm. The variation in positivity increased with age with the highest recorded in individuals >43years at 1.2%.
Next steps: Using the Alere Combo led to more Identification of positives compared to the National algorithm. This points to early Identification of the p24 antigen.
With 100% and 99.8% sensitivity and specificity respectively, the Alere Combo test can be used as screening kit especially in the high risk population groups characterized with high incidence. However, there is need to study the superiority of the kit compared to the 3rd generation algorithm with more populations in a longitudinal follow up

FRPEA022

Implementation of HIV Drug Resistance Testing in Ghana

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Background: Testing for HIV drug resistance prior to antiretroviral therapy (ART) is standard of care in the US but is rarely performed in Africa due to its high cost. The prevalence of HIV drug resistance is increasing in resource-limited settings (RLS). An affordable and feasible strategy is needed in RLS to identify individuals with drug resistance and prescribe effective ART. Our group developed a low-cost oligonucleotide ligation assay (OLA) that detects mutations conferring resistance. Little data exists on implementing HIV drug resistance testing in RLS. Here, we describe the implementation of OLA in one laboratory in Ghana and discuss practical aspects of executing the OLA over two years.
Methods: The OLA was transferred to a research laboratory at the Koler-bu Teaching Hospital Accra, as part of a randomized trial testing use of the OLA in individuals starting first-line ART to improve virologic outcome. The Seattle Lab Manager (SLM) transported equipment needed for OLA to koler-bu, set up the laboratory, and trained two lab technicians to perform OLA. Two additional technicians were later trained. Technicians had education either as a lab technologist or lab scientist, with limited training in molecular techniques.
Results: OLA was successfully performed by the trained lab technicians on 565 blood samples. Each week, OLA was performed on approximately 7 samples, requiring an estimated 10 hours of technician labor, and 2 hours of remote technical support, review of test results and oversight from the SLM. Some sample results were delayed during two temporary, month-long pauses in testing of specimens, due to suboptimal performance of the OLA. This required trouble-shooting by the SLM in conjunction with lab personnel.
Conclusion: OLA technology was successfully transferred to the laboratory. However, it required time-intensive technician labor and substantial oversight by the SLM. The complexity of OLA, and a paucity of lab technicians and on-site supervisors trained in molecular techniques are potential bottlenecks for implementation of the current version of OLA at a larger population-level. Research is ongoing to develop OLA Simple, a simplified kit aimed to address these challenges and serve as a point-of-care assay.

FRPEA023

From Sequence Data to Patient Result: A Solution for HIV Drug Resistance Genotyping with Hyrax Exatype, End to End Software for DNA Sequence Analysis and Patient Result Generation

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Background: With rapid scale-up of Antiretroviral Therapy (ART), there is an ongoing concern on probable emergence and transmission of HIV drug resistance (HIVDR) mutations. This has led to a push for routine HIV DR testing to guide clinical decisions for selected populations (clinical failure, toxicity, non-suppressed, persistent low-level viremia and PMTCT) before regimen switch. Much of the wet laboratory processes currently have been standardized, though a slow, labor-intensive, data transfer, and subjective manual sequence interpretation step is still required to finalize and release HIV DR patient results. This is likely to be a bottleneck for laboratories and programs scaling up HIV DR testing.
Methods: We performed a laboratory-based validation of a new Hyrax Biosciences owned software Hyrax Exatype. HIV-1 drug resistance testing was performed on 135 clinical samples at National HIV Reference Laboratory (NHRL). ABI sequence data files were manually edited, then analyzed and result generated using the gold standard method (Recall software and Stanford University HIV DR database) and the same raw DNA sequence data were subsequently reanalyzed using Hyrax Exatype, without human intervention. We then assessed the performance characteristics of Hyrax bioscience Exatype against the standard method (Recall and Stanford database). Hyrax Exatype is freely available simple web based HIV Drug resistance platform at https://sanger.exatype.co.za.
Result: In total, 126 out of 135 sequences were analyzed and the result generated by both standard and Hyrax software. Result production using Hyrax requires minimal hands-on time in comparison to the gold standard (6 hours using the gold standard method hours versus 1.5 Hyrax computation-hours). Concordance between the two systems was 99.8% for 311,227 bases compared. (99.7 %) of discordances were attributed from the nucleotide mixtures as a result of sequence editing of mixtures in Recall. Both methods identified similar (99.1%) of key antiretroviral resistance-associated mutations resulting in a 99.2% concordance of resistance susceptibility interpretations. Cohen's kappa (0.97 to 0.99) indicated almost perfect agreement among the two methods.
Conclusion: Hyrax Exatype HIV DR sequence analysis platform and result generation tool thus provides both standardizations of sequence analysis and efficiency in HIV DR data workflow and result generation.

FRPEA024

Adherence in Adolescent, HIV Infected Patient in Northern Part of Ghana

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Background: Adherence in adolescence is multifactorial, it depends on treatment regimen, patient´s lifestyle, autonomy and the knowledge he has of his infection. We aimed to assess the adherence to HAART in adolescents on therapy since early childhood during the transition.
Methods and Materials: Prospective cohort study. We enrolled HIV infected patients older than 14 years who had been on the same regimen on the last 6 months and attended the adolescent clinic within the transition programme between January 2014 and December 2015. Information was obtained from a self-administered semi-structured questionnaire of 8 questions; one required self-assessment of adherence, using a scale from 1 to 10. Medical charts were reviewed for the record of current antiretroviral therapy, CD4 counts and viral load.
Results: 75 questionnaires were obtained. 69 of the patients (92%) had a CD4 count > 200/mm3 and 66 (88%) were virologically suppressed (VL < 1000 copies/mL), As regards the assessment of autonomy, 13,3% pick up their own medicines while in 61% of the cases, their parents do it for them. 41 patients (54,6%) need someone to remind them of taking their pills while 30,6% link taking medication with some daily event, and 14,6% need no help at all to remember taking it. 51 patients (68%) claim that taking pills does not alter their lives, 20% that it alters it just a bit, and only 1% that it alters it a lot or quite a lot. 20 adolescents (27%) self-reported an adherence rate > 95%. All of them showed an undetectable viral load. 48 adolescents (64%) self-reported an adherence rate of 80% or more, of which 95,3% showed an undetectable viral load. Having forgotten was the main reason reported for skipping medication doses, followed by changes in daily routine and being tired of taking pills.
Conclusions: Adherence of 80% or more has a strong correlation with virologic suppression, which leads us to two hypothesis. First, these patients may have a low self-esteem regarding their daily medication intake, thus reporting a subjective lower adherence rate. Second, new antiretroviral drugs are highly effective and may achieve undetectable viral loads with lower adherence rates.

FRPEA025

Analysis of Drug Resistance among People Living with HIV/AIDS in Northern Part of Ghana

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Background: Understanding the mechanisms of drug resistance can facilitate better management of antiretroviral therapy, helping to prevent transmission and decrease the morbidity and mortality of people living with HIV/AIDS.
Methods: A retrospective cohort study of HIV-infected patients who visited the Department of Infectious Disease from June 2005 to June 2010 was conducted in Temale, Ghana. Logistic regression analysis was performed to analyze risk factors for drug resistance among HIV-infected people with virological failure. The related collected factors included patient age, gender, marital status, infection route, baseline CD4 count, antiretroviral therapy regimens.
Results: There were 575 subjects selected for this study and 369 participated in this research. For the antiretroviral therapy drugs, the rates of transmitted drug resistance and acquired drug resistance were significantly different. The non-nucleoside reverse transcriptase inhibitor (NNRTI) had the highest drug resistance rate (transmitted drug resistance, 10.9%; acquired drug resistance, 53.3%) and protease inhibitors (PIs) had the lowest drug resistance rate (transmitted drug resistance, 1.7%; acquired drug resistance, 2.7%). Logistic regression analysis found no factors that were related to drug resistance except marital status (married status for tenofovir: odds ratio = 6.345, 95% confidence interval = 1.553-25.921, P = 0.010) and the time span between HIV diagnosis and initiating antiretroviral therapy (≤6M for stavudine: odds ratio = 0.271, 95% confidence interval = 0.086-0.850, P = 0.025; ≤6M for didanosine: odds ratio = 0.284, 95% confidence interval = 0.096-0.842, P = 0.023; ≤6M for tenofovir: odds ratio = 0.079, 95% confidence interval = 0.018-0.350,P< 0.001).
Conclusions: NNRTI had a higher DR rate compared with nucleoside reverse transcriptase inhibitor (NRTI) and PIs, consequently, LPV/r was a reasonable choice for patients with NNRTI drugs resistance in Ghana. Only married status and a time span ≤6 month between the HIV confirmed date and the time initiating antiretroviral therapy were risk factors for TDF drug resistance. Both baseline HIV-RNA load and resistance test is crucial for TDR diagnosis.

FRPEA026

Salvage Therapy Selection through HIV Drug Resistance Testing in Patients Failing Protease Inhibitor 1st and 2nd Line Regimens in Murang'a County, Kenya

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Background: Kenya´s HIV guidelines have been recommending efavirenz based 1st line regimen with a backbone of tenofovir and lamivudine for adults and adolescents starting antiretroviral therapy (ART). Children below 3 years infected with HIV are started on a protease inhibitor(PI) 1st line based regimen. Dolutegravir became available recently and has been adopted in the Kenya 2018 HIV guidelines. Adult & adolescents patients with confirmed 1st line treatment failure are switched to PI based 2nd line ART regimens and a drug resistant testing recommended for children, adolescents and adults failing 1st & 2nd line PI based regimen so as to select an appropriate 3rd line or salvage therapy. Treatment failure is defined as a viral load of 1000 cp/ml or more in patients who have been on ART for more than 6 months.
Methods: Using a standardized patient summary form, a confirmed treatment failure from the facility is summarized and cascaded to the HIV regional technical working groups for deliberations, depending on the case, drug resistance testing can be recommended by the HIV experts.
Results: Between January to June 2019, Murang´a county summarized PI based regimen confirmed treatment failure cases from its various health facilities and cascaded to the regional technical working group for deliberations, of the 20 cases sent, 9 (45%), drug resistance testing was approved, 5(55%) of the 9 cases had major mutations with highly resistance drug profile picture necessitating the need to modify ART treatment of these patients and construct salvage therapies.
Conclusions and Recommendations: Drug resistance testing is very key in appropriate ART selection especially in this era of increasing ART resistance among patient taking antiretroviral drugs. Governments need to invest more to ensure availability of drug resistance testing services even among newly diagnosed HIV patient initiating on ART.

FRPEA027

Mutations Génétiques du VIH au Sein des Patients Bénéficiant des Programmes de Prévention de la Transmission Mère Enfant (PTME) à Ouagadougou, Burkina Faso

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Background: Cette étude sur la prévention de la transmission mère-enfant du VIH a comme but de rechercher les mutations sur le VIH pouvant induire des résistances aux antirétroviraux (ARV).
Methods: Il s'agit d'une étude prospective portant sur les femmes enceintes en consultation prénatale à l'hôpital Saint Camille de Ouagadougou. Les échantillons de femmes enceintes ont été analysés à l´aide de tests "Determine HIV1/2", "SD Bioline", "Immunocombs" selon l'algorithme nationale. La transmission verticale a été estimée par PCR chez les nouveau-nés de mère séropositives. La résistance du VIH-1 aux ARV, les sous-types et CRF ont été déterminées en utilisant le kit ViroSeq, à l´aide du séquenceur ABI PRISM 3130.
Results: Dans cette étude, 3215 femmes enceintes ont été incluses. Parmi elles 12,26% (394/3215) ont été diagnostiquées positives au VIH et ont été incluses dans le programme de PTME. Sur les 388 enfants issus de ce programme, 2 (0,52%) ont été diagnostiqués positifs au VIH. Les mutations génétiques identifiées comme induisant des résistances aux ARV étaient majoritairement M184V, K103N, A98G, T69S, E138A, V179E, Y181C, G190A, Y115F, D67R, D67E, L74V, M184I, V90I, K103E, G190R. Les ARV utilisés dans la PTME concernés par les mutations de résistances étaient : Lamivudine (3TC), Emtricitabine (FTC), Abacavir (ABC), Tenofovir (TDF), Delavirdine (DLV), Efavirenz (EFV), Névirapine (NVP), Etravirine (ETR), didanosine (DDI). Les sous types et formes recombinantes circulantes (CRF) du VIH-1 étaient : CRF06_CPX (58,8%), CRF02_AG (35,3%) et le sous type G (5,9%). Les sous-types retrouvés étaient les mêmes au sein de chaque couple mère-enfant.
Conclusions and Recommendations: Les antirétroviraux réduisent le taux résiduel de transmission verticale du VIH. Cependant, il y a une émergence de mutations qui induisent des résistances du VIH aux antirétroviraux. Ce qui exige donc qu'il y ait une surveillance active de ces mutations/résistances au sein des services de PTME.

FRPEA028

Children & Adolescents Failing Second-line Antiretroviral Therapy

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Background: With universal test and treat, a growing number of HIV infected children are diagnosed, treated and are surviving into adolescence on antiretroviral therapy (ART). Protease Inhibitor (PI) treatment is increasing but drug resistance and adherence pose challenges. We conducted a longitudinal study in rural Zimbabwe to determine virologic failure and patterns of drug resistance among children and adolescents on PI.
Methods: HIV infected children and adolescents (3-21 yrs.) on ART and virus load differentiated care (VLDC) through Chidamoyo Christian Hospital (CCH) were followed from 2017-2019. PI recipients with viral load >1000 copies/ml (virologic failure [VF]) were genotyped. To identify drug resistance mutations (DRM), amplicons were sequenced by Molecular Cloning Laboratories, USA. Chromatograms were assembled (Geneious v.2019.1.1) and mutations from protease (PR) codons (1-99) and reverse transcriptase (RT) codons (1 to 255) were analysed on the Stanford University HIV Drug Resistance Database (HIVdb).
Result: VF was identified in 89/440 (20%) of participants; of the 160 who were on PI/r, 40 had VF (25%) and 30/40 (75%) were successfully genotyped. Among the 30, there were more males 60% than females. The median age was 14 years (IQR, 3-21) and duration of treatment was a median of 6 years on first-line and 2 years on second-line. All were HIV-1 subtype C viruses. Wild-type virus was found in 5 (17%), and 25 (83%) had DRMs. Six (20%) had triple class resistance, consisting of PI, nucleoside reverse transcriptase inhibitor (NRTI) and non-nucleoside reverse transcriptase inhibitor (NNRTI) DRM; 24/30 (80% had at least 1 NNRTI associated mutation: K103N (11), G190A (9), and Y181C (7). Nineteen participants (63%) had NRTI DRMs: M184V (16), thymidine analogue mutations (9), and K65R (4) mutation. PI associated mutations, mixtures and polymorphisms were found in 6, including M46I, I54IM, I54L, T74S, N88T, N88S and L90LM.
4.0 Conclusions and Recommendations: Triple class resistance was identified in only 20% of subjects genotyped providing evidence that virologic failure on PI-based regimens is largely due to poor adherence. Nonetheless, most children and adolescents accumulate NRTI DRM. How NRTI resistance will impact Tenofovir, Lamivudine and Dolutegravir (TLD) regimens now being implemented across Africa, is an important question.
Keywords: ART, Drug Resistance, Children, Zimbabwe

FRPEA029

Résistance Primaire du VIH-1 aux Inhibiteurs de la Transcriptase Inverse et aux Inhibiteurs d´Intégrase chez les Patients Naïfs de Traitement au Sénégal

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Problématique: La surveillance de la résistance aux antirétroviraux reste un défi majeur dans les pays en développement. Les anti-intégrases sont désormais recommandées par l'OMS pour les traitements ARV de première ligne. L'objectif de cette étude était d'évaluer la prévalence de la résistance primaire des souches du VIH-1 aux inhibiteurs de la transcriptase inverse et aux inhibiteurs de l'intégrase dans le cadre de la surveillance de la résistance aux antirétroviraux au Sénégal.

Matériels et méthodes: En 2017, des patients naïfs de traitement antirétroviraux ont été recrutés selon le protocole de l'OMS au niveau de différents sites de prise en charge à travers le pays. A partir de 5 ml de sang veineux, des spots de sang séché (DBS) ont été confectionnés (50µl de sang par spot) et transférés au laboratoire de référence de Bactériologie-Virologie de l'Hôpital Aristide Le Dantec. Les DBS ont fait l'objet d'un génotypage de résistance du VIH1 -suivant la technique de l'Agence Nationale de Recherches sur le SIDA et les Hépatites Virales (ANRS/AC11). Les séquences consensus obtenues ont été analysées sur la base de données de Standford (HIVDBV8.1.1) et l'analyse phylogénétique a été réalisée à l'aide du logiciel Seaview v4.4.1.

Résultats: 250 DBS ont été reçus provenant de 33 sites. L'âge médian était de 46 ans avec un sex-ratio de 0,57. Les taux de succès du génotypage de résistance étaient de 53,6% au niveau de la RT et 44% au niveau de l'intégrase.

L'analyse des mutations a montré que le taux de résistance transmise était de 2,8% pour les INTI et de 5.6% pour les INNTI. La répartition des souches ayant au moins une mutation de résistance en fonction des sites de recrutement laisse suggérer une prévalence de résistance plus importante chez les patients provenant de la zone Sud du pays.

Aucune mutation majeure de résistance n'a été retrouvée au niveau de l'intégrase mais 2 mutations de polymorphisme ont été observée en position E157Q (n=3) et G140GE (n=1).

Concernant la diversité des souches, le CRF02_AG demeure la souche prédominante aussi bien au niveau de la RT que de l'intégrase avec des taux respectifs de 84% et de 63%.

Conclusion: Ces données montrent une faible circulation de souches résistantes aux INTI et aux inhibiteurs d'intégrase chez les patients naïfs et une augmentation de la résistance aux INNTI. Ces résultats suggèrent la possibilité d'intégrer les inhibiteurs de l'intégrase dans les combinaisons ARV de première ligne au Sénégal.

FRPEA030

A Pragmatic Approach for Ensuring the Quality of HIV Drug Resistance Testing in Resource-limited Settings: Experience from Cameroon

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Background: In resource-limited settings(RLS), HIV-1 drug resistance(HIVDR) testing is focused on protease(PR) and reverse transcriptase(RT). To ensure accuracy, proficiency testing is required but remains challenging in RLS. We sought to evaluate the reliability and reproducibility of HIVDR testing in Cameroon.

Methods: A comparative assessment was conducted on HIV-1 panels for HIVDR testing using Applied Biosystems genotyping. Drug resistance mutations(DRMs) and polymorphisms were identified using Stanford HIVdbv8.8 and subtypes were inferred by phylogeny. Reliability (kit controls) and reproducibility (clinical samples) were evaluated for concordance in sequence coverage-length (≥1035 nucleotides), subtype and DRMs/polymorphisms.

Results: Overall, 62-panel specimens were successfully amplified and sequenced: 4 kit controls and 58 samples from 27 treatment-experienced patients (24 duplicates, 2 triplets and 1 quadruplet). With kit controls, all 4(100%) sequences reached the required coverage-length and were identically classified as subtype B; DRMs/polymorphisms were 100% concordant in the PR (N37S[4/4], R41*[4/4], I54M[4/4], L90M[4/4]) and in the RT (M41L[4/4], K65R[4/4], K122E[4/4], Y181C[4/4], M184V[4/4], F214L[4/4]); giving 100% reliability. With clinical samples, all 58(100%) sequences reached the required coverage-length and were identically classified as 02_AG(15/27), F2(3/27), G(3/27), H(2/27), D(2/27), A(1/27) and 01_AE(1/27); DRMs were 100% concordant in the PR (M46IL[4], I47V[2], G48E[3], I54V[5], L76V[2], V82A[2], I84V[5], L89V[5], L90M[2]) with 96.4%(402/417) concordance for polymorphisms; DRMs in the RT were 100% concordant for NNRTI (A98G[15], K103N[34], V106AILM[13], V108I[8], E138AG[8], Y181CV[13], Y188L[8], G190AE[6], H221Y[10], P225H[9], F227L[9]) and 97.7% concordant for NRTI (M41L[12/12], K65R[13/14], D67GN[8/8], K70ENR[19/19], L74IV[11/13], V75IM[8/8], Y115F[11/11], M184IV[44/44], L210W[6/7], T215AFIY[20/20], K219EQ[4/4]); discordance being quasi-species from 3 panels (K65KR, L74LI, L74LV, L210LW). RT-polymorphisms were 96.2%(1138/1183) concordant. Reproducibility for PR-RT DRMs in clinical samples was 99.2%.

Conclusions and Recommendations: Reliability (kit controls) and reproducibility (clinical samples) of HIVDR-testing are excellent (>99%), despite the broad HIV-1 diversity. This supports such internal quality system for HIVDR strategy in RLS.

Keywords: HIV-1 drug resistance, Quality control, Resource-limited settings, Cameroon

FRPEA031

HIV Resistance in CSF Key Mutations to Reverse Transcriptase Inhibitors of the HIV-1Virus Extracted from the Cerebral Spinal Fluid of Persons Living with HIV

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Background: Central Nervous System deterioration in HIV infected persons is a high priority in their management. However, there is limited information regarding the key mutations that enhance resistance to the antiretroviral drugs (ART), since CSF HIV genotyping is seldom done. Therefore, the study described the key mutations to Reverse Transcriptase Inhibitors (RTI) of the HIV-1 virus extracted from the Cerebral Spinal Fluid (CSF) of persons living with HIV.
Methods: The CSF samples were collected from five individuals admitted at the Joint Clinical Research Centre between 2015 and 2017. The patients were HIV positive, had been on ART (second and first line) for more than six months but were presenting with impaired CNS symptoms. The study was experimental. HIV RNA was extracted from the CSF samples reverse transcribed and amplified. The Reverse Transcriptase fragment was then sequenced using the Sanger sequencing method and the mutations analysed by the Stanford HIV database. The sample size was limited due to the extremely painful method of sample extraction from the patient, and the CSF low viral loads.
Results: The most clinically significant resistance mutations against Nucleoside Reverse Transcriptase Inhibitors were; M184V- being present in all the five samples and K65R in only one. There were four classical Thymidine Analog Mutations (TAMs) identified (K70R, K219Q/E, M41L and D67N). There was one additional TAM T215Y/F, non-TAM L74I and two accessory mutations identified V75M and T69D. The most significant resistance mutations expressed towards non-nucleoside reverse transcriptase inhibitors (NNRTI) were; Y188F/L, Y181C, G190S, present in four samples and K238N (accessory mutation), present in one sample, only one sample did not express even one NNRTI Mutation.
Conclusions and recommendations: All the HIV-1 viruses extracted from the five CSF samples expressed at least one major mutation which conferred resistance to most reverse transcriptase inhibitors. However, the sample size was limited thus an investigation on a larger scale should be carried out to analyse the clinical significance of CSF genotyping on patient care.