10th International Workshop on HIV Treatment, Pathogenesis, and Prevention Research in Resource Limited Settings

INTEREST

Abstracts

Oral Presentations

Abstract: 1

Prevention of Mother to Child Transmission

Decline in positivity rates among HIV-exposed infants with changes in PMTCT ARV regimens in Nigeria: evidence from 7 years of field implementation

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Background: As countries scaled up prevention of mother to child transmission of HIV (PMTCT) services, scientific evidence was also evolving leading to changes in recommended antiretrovirals (ARVs) for PMTCT to more efficacious regimens. Nigeria's PMTCT program has evolved over the years with changes in guideline recommendations, including cut-off for art eligibility and transition from monotherapy (single dose nevirapine) to the use of more efficacious triple ARVs for PMTCT. There is however limited insight into what happens in the program implementation setting where events are subject to much more varying 'un-controlled' conditions compared to controlled trials. We set out to examine the trend of HIV-infection among HIV-exposed infants with the introduction of more and more efficacious ARV combinations for PMTCT over time.

Method: This was a retrospective review of routinely collected PMTCT service data from 2008 to 2014 in 682 secondary and tertiary health facilities across Nigeria. The ARV regimen was measured by the proportions of different ARV regimens received by HIV-positive pregnant women each year and the HIV-infection among infants was determined by the rate of HIV-positive PCR tests each year. District health information software (DHIS) was used to extract data from health facilities and to aggregate and analyze data.

Results: Maternal HIV positivity rates varied from 4.1% in 2008, 2.9% in 2011, 3.2% in 2012, then declined steadily to 1.9% in 2014. The total number of pregnant women who tested positive for HIV and received different ARV regimen for PMTCT during the period (2008-2014) was 63,774; ranging from 7,506 in 2008 to 10,388 in 2014. Uptake of sdNVP by the positive pregnant women was 34.4%, 41.6% and 45.9% in 2008, 2009 and 2010 respectively. HIV positive pregnant women on triple ARVs (prophylaxis or treatment) increased from 22% in 2008 to 99% in 2014. Infant HIV positivity rates showed a steady decline over the years, from 38% in 2008 to 6% in 2014 ($p<0.001$).

Conclusions: We demonstrated the declining trend of HIV-infection among HIV-exposed infant in Nigeria as more and more efficacious ARV regimens were available for HIV-positive pregnant women. We conclude that if current efforts were sustained and coverage widened, an alignment of the country's PMTCT programme with the best available scientific evidence could lead to elimination of mother to child transmission.

Conflict of interest The data reviewed is from a project funded by PEPFAR through a cooperative agreement with USAID.

Abstract: 2

Pediatrics

Favorable outcomes of pediatric second-line protease inhibitor-based antiretroviral treatment in Uganda

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Background: The number of children requiring second-line antiretroviral treatment (ART) in low- and middle-income countries (LMIC) is rapidly increasing. Data on second-line treatment outcomes and HIV drug resistance (HIVDR) in children in these settings are scarce, but urgently needed to evaluate second-line and design third-line ART programs. This is the first prospective study reporting HIVDR testing during second-line treatment in children living in LMIC.

Materials and methods: Children ≤12 years of age starting second-line protease inhibitor (PI)-based ART were enrolled at three study clinics in Uganda from 2010 to 2011, and were followed up for 24 months. Viral load (VL) and genotypic resistance testing was done at second-line ART initiation and every six months thereafter. The 2015 IAS-USA mutation list was used to score drug resistance mutations and susceptibility of the prescribed ART regimen was calculated with the genotypic sensitivity score using the Stanford algorithm.Treatment failure was defined as either having two consecutive VL >1000 cps/ml, a single VL>1000 cps/ml at the last study visit, or death after at least six months of second-line treatment. Associations between patient characteristics and treatment failure were analyzed using the student's t-test and χ^2 test. The relatively small sample size did not allow for multivariable regression analyses.

Results: 64 children were enrolled and switched to ritonavir-boosted lopinavir (LPV/r)-based second-line ART. All children were PI-naive and all had one or more drug resistant mutations (DRMs) towards (non-)nucleoside reverse transcriptase inhibitors at the time of second-line ART initiation. At 12 and 24 months after treatment switch, virological suppression (VL<400 cps/ml) was achieved in 86.4% and 83.6% of the children, respectively. During follow-up, 12 children (18.8%) experienced treatment failure. None of the failing children had PI mutations. Children who were underweight at second-line treatment initiation and children with suboptimal adherence during follow-up were more likely to experience treatment failure (p=0.04 and p=0.02, respectively). Predicted reduced susceptibility to the second-line regimen was not associated with second-line treatment failure. At the end of 24 months of follow-up, 59 (92.2%) children were still in care and on treatment; 2 (3.1%) died, 2 (3.1%) were lost to follow-up, and 1 (1.6%) transferred out.

Conclusions: Virological suppression rates in children on second-line PI-based ART were favorable compared to results of children on first-line ART, and comparable to adults on second-line ART in LMIC. The absence of PI mutations and the association of suboptimal adherence with treatment failure suggest that poor adherence, rather than the development of HIVDR, is the main mechanism for failure in these children. This is reassuring, as third-line options are currently unavailable for children in LMIC. However, it is important to consider that PI mutations are likely to eventually develop in children with poor adherence even though PIs have a higher genetic barrier compared to non-nucleoside reverse transcriptase inhibitors. Our results are encouraging for children requiring second-line PI-based ART in LMIC, but stress the importance of adherence support.

No conflict of interest

Abstract: 3

Pediatrics

Transmitted Drug Resistance and First-line ART Treatment Outcomes in Ugandan Children

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Introduction: Transmission of drug-resistant (TDR) HIV-1 can impair virologic response to antiretroviral therapy (ART) especially in children. This study evaluated the effect of TDR on virologic and acquired drug resistance (ADR) outcomes among children initiating first-line ART.

Methods: Children ≤12 years initiating first-line ART were enrolled at 3 sites in Uganda between 2010 and 2011. Blood was taken at baseline and 6-monthly in 24 months of ART for later determination of viral load (VL) and pol genotypic testing if VL>1,000 copies/ml at JCRC Kampala laboratories. The 2014 IAS-USA mutation list and Stanford algorithm were used to score drug resistance mutations (DRMs) and susceptibility. Patients were classified into two groups: fully active (no TDR or TDR without reduced susceptibility) and patients with TDR and partially active ART. Virological failure (VF) was defined as 2 consecutive VLs >1000 copies/ml, at least 6 months from ART initiation. Factors associated with VF and acquired drug resistance (ADR) were assessed in multivariate logistic regression analysis and evolution of resistance was described.

Results: 317 children median age 4.9 years were enrolled on mainly NNRTI based regimens (91.2%). TDR mutations were detected in 47(16.9%) participants of whom 22(46.8%) initiated a partially active ART. 256(80.8%) participants were still on first line ART and in care at 24 months of follow-up of whom 32%(92/287) had VF. Children with TDR and partially active ART had significantly higher risk of VF (aOR:15.25, 95%-CI:3.77-61.7,p<0.001) and ADR (aOR:3.47, 95%-CI:1.31-9.22,p<0.012). A single VL >1000 copies/ml at 6 months on treatment was strongly associated with VF (OR:22.09, 95%-CI:9.68-50.42,p<0.001) and ADR (OR:9.89, 95%-CI:5.16–18.94;p<0.001). Other factors associated with VF in the adjusted model were higher baseline VL (aOR:2.28,p<0.001) and WHO stage 2 vs Stage 1 (aOR:10.3,p=0.022). Among the 66 children with prolonged viraemia, there was a high rate of acquisition of DRMs.

Conclusions: In this pediatric cohort, TDR was found to be high and strongly associated with VF and ADR. Accumulation of DRMs was high and may jeopardize future therapeutic options. Efforts are needed to incorporate affordable drug resistance testing in developing countries to prevent the use of suboptimal ART. In the context of universal access of VL monitoring, programmatic use of a 6 month VL on treatment would detect majority of future VFs early and allow for treatment adjustment to prevent ADR.

No conflict of interest

Abstract: 4

Pediatrics

Ultra-deep pyrosequencing of paediatric HIV-1 drug resistance and coreceptor suggests possible suitability of protease inhibitors and maraviroc at younger ages in Cameroon

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Background: The current limited availability of paediatric regimens as well as the use of low-genetic barrier drugs for prevention of mother-to-child transmission (PMTCT) in sub-Saharan Africa (SSA) increase risks of vertically transmitted HIV-1 drug-resistance (HIVDR), and may prompt the need for alternative paediatric therapeutic regimens for long-term strategies in SSA settings. In this prospect, we aimed to ascertain HIVDR and coreceptor usage in both majority and minority viral populations from vertically infected children, according to maternal PMTCT-exposure in a typical resource-limited setting.

Materials and Methods: We conducted a comparative study among 18 Cameroonian HIV-1 vertically infected children, of whom: seven from PMTCT-exposed mothers (case group) vs. 11 from mothers without PMTCT-exposure (control group). Sanger sequencing and ultra deep 454-pyrosequencing (UDPS) were performed, with 1% UDPS detection cut-off. HIV-1 subtyping was performed using molecular phylogeny. HIV-1 protease/RT drug-resistance mutations (DRMs) and coreceptor usage were interpreted using *Stanford HIVdb* list and *geno2pheno*.v2.5, respectively. Viruses were considered CXCR4-tropic (X4-variants) by UDPS when ≥2% viral species had a false positive rate (FPR) ≤3.5%, or by Sanger-sequencing when FPR was ≤10%. HIV-1 variants in children were compared between both PMTCT-groups. Viral-tropism was also explored according to age and CD4-count. Statistical analyses were performed using the statistical open source environment R.v.3.1.1; with p-value<0.05 considered significant.

Results: Median [interquartile range, IQR] age, plasma viral load and CD4-count were 6 [4-10] years, 5.5 [4.9-6.0] log_{10} copies/ml, and 526 [282-645] cells/mm^3, respectively. Circulating HIV-1 clades were CRF02_AG (50%), F (33.3%), CRF01_AE (11.1%) and CRF11.cpx (5.6%). All children had wild-type viruses at both Sanger sequencing and UDPS, except for one PMTCT-exposed infant (1 year) harbouring the vertically transmitted minority K103N (8.31%) detected solely by UDPS; this infant was born to an RTI-treated mother harbouring L74V (2.54%) and Y181C (96.67%). Based on UDPS, 5/15 (33.3%) children harboured X4-variants, including two cases of X4-variants (at UDPS frequencies of 3.9% and 36.2%) reported as R5 on Sanger sequencing. Of relevance, X4-variants were found only in children aged >5 years (5/9 [55.6%] vs. 0/6 [0%], p=0.040), thus underpinning limited CXCR4 vertical transmission, and later switch from R5 to X4 following chronic HIV infection. X4-variants were also at a higher proportion among children with CD4≤200 cells/mm^3 (3/4 [75%] vs. 2/11 [18.2%], p=0.077), thus indicating switch to X4-variants following immunodeficiency among children.

Conclusions: Minority NNRTI-DRMs are likely present with PMTCT-exposure, without any protease inhibitor (PI)-DRMs, suggesting the potential advantage of starting paediatric treatment with PI-based regimens. Interestingly, among children under five years, CCR5-variants prevail, implying vertical transmission with CCR5-tropic viruses and possible usage of maraviroc at younger ages within SSA. These added values of UDPS, on improving paediatric HAART strategies, merit further investigative considerations in resource-limited settings.

No conflict of interest

Abstract: 5

Key Populations: prevention and treatment challenges

Predictors of HIV-testing in South African adolescents: schools-based testing, pregnancy and sexual experience

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Introduction: Since 2010, the South African National Department of Health (DOH) has dramatically scaled up its HIV/AIDS program through an intensified HIV testing campaign coupled with the rapid decentralization of care and treatment services. This model recognizes the roles of NGOs and CBOs as central to the delivery of initiatives across South Africa's varied sociocultural landscape. The incorporation of 'tried and tested' techniques, many of which originated in the grassroots sector and led by frontline health workers, formed the cornerstone of this ambitious scale-up of services delivery. The Department of Education (DOE) contributed to the efforts through its schools-based HIV awareness and testing campaigns, but with mixed results.

Material & Methods: 3515 adolescents aged 10-17 (mean age 13.5 years, 56.7% female, 50.6% urban location) were originally recruited between January 2010 and June 2011 in two rural and two urban districts with >30% HIV in Mpumalanga and the Western Cape. Within each health district, census enumeration areas were randomly selected. Within each census enumeration area, all households with adolescents aged 10-17 were included in the study. One child in each household was interviewed and where there were multiple adolescents in the household, one was chosen at random. Between December January 2011 and June 2012, 3401 participants (96.7% retention rate) were traced and re-interviewed. Refusal rate at baseline was 2.8% and <.5% at follow-up.

Results: Analyses used cross-sectional data from the follow-up and were conducted in three stages using SPSS 20. Using multivariate logistic regression models, gender (OR 1,45), age (OR 1,29), province (OR .39), urban/rural location (OR .55), school dropout (OR 2.66), attending a school with an HIV-testing campaign (OR 9.49), contact sexual abuse victimisation (OR 1.63), and ever been pregnant or having made someone pregnant (OR 10.89) predicted HIV-testing. Being AIDS-affected and household poverty was not a predictor of HIV-testing. Differences in predictors of HIV-testing were observed between boys and girls. For boys, school dropout (OR 2.82) and attending a school with an HIV-testing campaign (OR 13.67) were the strongest predictors for HIV-testing. For adolescents who were sexually active, gender (OR 2.54), urban/rural location (OR .51), school dropout (OR 2.59), attending a school with an HIV-testing campaign (OR 11.13) and having ever been pregnant or made someone pregnant (OR 6.14) were predictors of HIV testing.

Conclusions: In sum, internal and external factors across a broad range of mediators and moderators play an integral role in health-seeking behaviour choices, including VCT. This is particularly salient among adolescent populations whose exposure to evidence-based HIV prevention education and novel interventions may hold the key to delivering an 'AIDS-free generation.' Without insights into factors associated with testing uptake coupled with responses to the nuanced needs of key population groups, the realisation of 90-90-90 targets in some settings may face continued challenges.

No conflict of interest

Abstract: 6

Economics, financing, policy, regulatory and ethical issues

EDCTP as a model for Europe-Africa partnership on HIV/AIDS research and capacity development: Examples from Cameroon

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Introduction: The European & Developing Countries Clinical Trials Partnership (EDCTP) was established to pool human/financial resources and to provide a platform for clinical research cooperation between European and sub-Saharan African (SSA) countries. EDCTP's goals are to support collaborative research that accelerates the clinical development of new or improved interventions (drugs, vaccines, diagnostics) to prevent or treat HIV/AIDS, TB, malaria and other poverty-related and neglected infectious diseases (PRDs) and to promote capacity building and networking in SSA.

Materials and Methods: EDCTP1 (2003-2015): 65 calls for proposals (CFP); 789 submitted applications; 254 grants awarded, involving 274 institutions, totalling 208M€. Based on grantee reporting, we have analysed the EDCTP1 programme HIV outputs, specifically regarding Cameroonian participation.

Results: Overall, 68 grants for HIV and HIV/TB were awarded (68.5M€), including 30 HIV trials (17 drug/3 microbicide/8 vaccine/2 on e-devices) and 9 HIV/TB co-infection trials. These grants involved collaboration between 67 institutions from 13 European countries and 88 institutions from 24 SSA countries. EDCTP trials informed national/international policies through adult/paediatric/adolescent and HIV/TB co-infection treatment trials. EDCTP awarded ~1.0M€ to 6 Cameroonian institutions for activities on ethics/regulatory capacities, fellowships, HIV and malaria. >500k€ of this supported HIV trials and capacity development. The 2LADY study conducted a phase III multicentre trial of 2nd line antiretroviral treatment in adults in Cameroon, Senegal and Burkina Faso, confirming the WHO recommendation of boosted protease inhibitors with NRTIs for 2nd line. One of two senior fellows in Cameroon contributed to capacity building through HIV vaccine research. Furthermore, the EDCTP-funded Central African Network for TB, AIDS and malaria (CANTAM) was established in 2008 with 2.8M€ awarded to 6 institutions across Cameroon (~800k€), Gabon, Congo and Germany. CANTAM increased capacity to conduct Phase I-III HIV/AIDS trials, through epidemiological studies in Cameroon and Congo and career development of fellows, plus training workshops on ethics, GCLP, data management and diagnostics for HIV. CANTAM generated 20 publications and supported 34 long-term trainees: 1 post-doc; 13 PhDs; 13 MScs; and 7 MDs.

Conclusions: EDCTP-funded grants in Cameroon have contributed to progress towards the Millennium Development Goals, HIV global health policy and strengthened clinical research capacity in SSA. EDCTP will continue supporting trials, clinical capacity building and networking, in collaboration with global health initiatives and funders. EDCTP2 (2014-2024) will receive ≤683M€ from the European Union and matching funding from European Participating States. The ~1.3bn€ budget will support phase I-IV clinical trials in SSA and contribute towards achieving the Sustainable Development Goals. EDCTP2 aims to: promote greater alignment and coordination of European and African national research programmes on PRDs; increase financial contributions from African countries to clinical trials; and leverage cofunding from public/private sources. African nations can now become EDCTP members, providing a strong and equal European-African partnership, with Cameroon participating as a member since 2014. EDCTP2 CFPs are broad, aiming to address research areas of importance to SSA not already funded by others. CFPs have covered diagnostics, treatment and research capacity development, with future CFPs expected to address gaps in treatment/prevention of HIV/AIDS and other PRDs in SSA. - *No conflict of interest*

Abstract: 7

Antiretroviral Treatment and HIV Care, Comorbidities

Accumulation of HIV-1 drug resistance after continued virological failure on first-line antiretroviral therapy in adults and children.

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Introduction: Access to antiretroviral therapy (ART) for HIV is expected to further increase as immediate treatment irrespective of $CD4^+$ cell count is now recommended. Limited availability of viral load (VL) monitoring in ART programs in sub-Saharan Africa can delay switching to second-line ART, leading to the accumulation of drug resistance mutations. We evaluated the accumulation of resistance and predicted drug susceptibility to nucleoside reverse transcriptase inhibitors (NRTIs) and non-NRTIs (NNRTIs) after continued virological failure on first-line ART in adults and children in sub-Saharan Africa.

Material & Methods: We included prospective cohort data of HIV-1-positive adults (≥18 years) from 13 sites in Nigeria, Uganda, Kenya, Zimbabwe, Zambia and South Africa [PASER cohort], and children (≤ 12 years) from 3 sites from Uganda [MARCH cohort]. All participants received a NNRTI-based first-line regimen and annual plasma VL was retrospectively determined. *Pol* genotypic testing was performed in case of VL ≥1,000 cps/ml. Among participants experiencing virological failure (VL ≥1,000 cps/ml) at least two times during follow-up, drug resistance was assessed at first and continued failure. Drug resistance mutations were scored using the IAS-USA 2015 list and predicted drug susceptibility was calculated using the Stanford HIVdb algorithm Version 7.0.

Results: 2,737 adults and 289 children were included. Virological failure rates were 8.8% and 9.1% in adults, and 24.1% and 29.5% in children after 12 and 24 months, respectively, corresponding to 2-3 times higher rate in children than adults (both p<0.001). At first virological failure, drug resistance mutation(s) were detected in 87% of all participants. New drug resistance mutations accumulated with an average rate of 1.45 (SD 2.07) drug resistance mutations per year; 0.62 (SD 1.11) NNRTI resistance mutations per year and 0.84 (SD 1.38) NRTI resistance mutations per year. Mutational patterns at first and continued failure were similar in adults and children. While drug susceptibility was already reduced in many participants at first virological failure, the predicted susceptibility declined significantly between first and continued virological failure for all NNRTIs and NRTIs (all p<0.001). Between first and continued virological failure, the number of participants with predicted full susceptibility to nevirapine and efavirenz dropped from 16.0% to 5.9% (p<0.001) and 16.8% to 6.7% (p<0.001), respectively. The predicted full susceptibility to etravirine and rilpivirine dropped from 47.9% to 37.0% (p<0.001) and from 44.5% to 31.9% (p<0.001), respectively. At first virological failure, the predicted NRTI susceptibility was highest for zidovudine (91.6%), tenofovir (89.1%) and stavudine (86.6%). After continued failure, the predicted susceptibility remained highest for tenofovir (69.7%) and was lowest for abacavir (9.2%) and lamivudine/emtricitabine (10.1%).

Conclusions: Virological failure rates on first-line ART are 2 to 3 times higher in children compared to adults in sub-Saharan Africa, but drug resistance patterns are similar. Specific interventions such as improved paediatric drug formulations and adherence support are needed to improve virological suppression rates in children. To ensure long-term ART success, improved VL monitoring to prevent accumulation of drug resistance mutations and

new drug classes to construct fully-active regimens are required in sub-Saharan Africa.

No conflict of interest

Abstract: 8

Antiretroviral Treatment and HIV Care, Comorbidities

Tenofovir-containing first-line ART favourably reduce inflammation markers compared to thymidine analogue nucleoside reverse-transcriptase inhibitors

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Background: The WHO 2015 guidelines for first-line antiretroviral therapy (ART) recommend use of tenofovir (TDF) or zidovudine (AZT), combined with lamivudine / emtricitabine (XTC) plus efavirenz (EFV) or nevirapine (NVP). Stavudine (d4T) is being phased out because of well-recognized metabolic toxicities, while TDF is preferred over AZT because of better adherence and tolerability. Despite sustained viral suppression on ART, HIV-induced residual inflammation and immune activation may persist. Elevated plasma biomarkers of inflammation, such as IL6, sCD14 and IP10, during ART have been associated with AIDS and non-AIDS events, and mortality. We sought to compare the effect of specific antiretrovirals in first-line ART on residual inflammation, by assessing changes in biomarkers from pre-ART (D0) to month 12 (M12) in the context of a large multi-country cohort.

Methods: A panel of plasma biomarkers (IL-6, IL-8/CXL8, IP-10/CXCL10, MCP-1/CCL2, MIG/CXCL9, sCD163 and sCD14) was measured in HIV-1 infected adults enrolled in the PASER-M cohort, for whom stored samples were available at D0 and M12, who started on a non-nucleoside reverse-transcriptase inhibitor (NNRTI)-based regimen, and had suppressed plasma HIV-RNA (<50 cps/ml) at M12. Patients with tuberculosis or hepatitis B coinfection or drug substitution were excluded. None of the participants received a statin. Wilcoxon Sign-rank test was used to compare D0-M12 changes of biomarker levels. Linear regression was used to compare $\log_{10}$-transformed biomarker levels between TDF/AZT/d4T, adjusting for sex, age, viral subtype, NNRTI type and pre-ART biomarker level, pre-ART $\log_{10}$ HIV-RNA, and pre-ART CD4 cell count. NNRTI type was assessed as a potential effect modifier.

Results: Analyses included 290 participants (59% female), from Kenya (n=63), Nigeria (n=39), South Africa (n=53), Uganda (n=100) and Zambia (n=35), with median age 36 years, HIV-RNA 4.96 $\log_{10}$ cps/ml, CD4 count 143/µL, and receiving TDF (n=120), AZT (n=116) or d4T (n=54) plus XTC plus either EFV (n=141) or NVP (n=149). All biomarker levels decreased significantly from D0 to M12 (p<0.001) in all groups, except for IL-8 in d4T-containing regimens (p=0.1434). At M12, patients receiving a TDF-containing regimen had lower levels of IL-6 (p=0.003), IL-8 (p<0.001), IP-10 (p=0.049), MCP-1 (p=0.008) and sCD163 (p<0.001), higher levels of MIG (p=0.019) compared to those on d4T; and lower levels of MCP-1 (p=0.004) compared to AZT. Levels of sCD14 at M12 did not differ between groups. In patients receiving a NVP-based regimen, at M12 TDF-XTC had lower levels of IL-6 (p<0.001), IL-8 (p=0.001), IP-10 (p=0.005), MCP-1 (p=0.023) and sCD163 (p=0.027) compared to d4T-XTC; and lower levels of IL-6 (p=0.009) and MCP-1 (p=0.034) compared to AZT-XTC. In patients receiving an EFV-based regimen, at M12 TDF-XTC had lower levels of MCP-1 (p=0.004) and MIG (p=0.06) compared

to AZT-XTC; d4T-XTC could not be assessed due to few observations.

Conclusion: Inflammation biomarkers decreased after ART initiation, with greater reductions in patients receiving a TDF-containing regimen compared to d4T (IL-6, IL-8, IP-10, MCP-1, sCD163) or AZT (IL-6, MCP-1). These data suggest support for current WHO ART recommendations from an immunological perspective, although further study is needed to assess whether this translates into differential risk of AIDS and non-AIDS morbidity.

No conflict of interest

10th International Workshop on HIV Treatment, Pathogenesis, and Prevention Research in Resource Limited Settings

INTEREST

Abstracts

Poster Discussants

Abstract: 9

Antiretroviral Treatment and HIV Care, Comorbidities

Prevalence of non-infectious co-morbidities among HIV-positive subjects stably treated with tenofovir, lamivudine and ritonavir-boosted lopinavir in Cameroon

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Background: There existslimited data on the prevalence of non-infectious co-morbidities among Africancohorts established on antiretroviral therapy (ART). Understanding prevalenceof hypertension, dyslipidaemia, glucose intolerance, and renal dysfunction isessential for developing monitoring programmes and define feasible management-strategies. The aim of this study was to determine the prevalence ofcommon non-infectious co-morbidities in a cohort of HIV-positive adultsestablished on second-line ART with co-formulated tenofovir / lamivudine (TDF / 3TC) plus lopinavir / ritonavir (LPV / r).

Methods: Demographic,clinical and laboratory data were collected from consecutive eligible subjectsattending the HIV out-patient clinic of Yaoundé Central Hospital in the periodJuly 2014- July 2015. Patients underwent measurement of Body Mass Index (BMI), bloodpressure, and laboratory investigations comprising blood lipids, blood glucose,creatinine with estimated glomerular filtration rate ($eGFR_{CK\text{-}epi}$),plasma HIV-1 RNA load (Biocentric assay), and CD4 cell count.

Results: The studypopulation comprised 130 patients (104, 80% female), with median age of44 years (IQR 39, 52), BMI of 25.3 (IQR 22.0, 29.1), and duration of HIVdiagnosis of 8 years (IQR 6, 11). Overall ART duration was median 8 years (IQR6, 11). Subjects had started TDF / 3TC + LPV / r between 2006 and 2015 and at thetime of the assessment had received the regimen for median 33 months (IQR 13,47) and showed a median CD4 count of 482 cells/mm^3 (IQR 351, 626).The viral load was detectable (>60 copies/ml) in 25 subjects (19%) with amedian of 184 copies / ml (IQR 115, 995). Previously undiagnosed grade 3 or 4abnormalities comprised: 4 / 130 subjects with hypertension (3.1%); 6 / 130patients (4.6%) with hyperglycaemia (fasting blood sugar > 130 mg / dl); 62 / 130 subjects (47.7%) with total cholesterol > 200 mg / dl; and 37 / 130 subjects (28.5%) with LDL > 130 mg / dl. The median eGFR was > 90; and 2 / 130 patients(1.5%) had an eGFR<60.

Conclusions: A significant subset of patients stably treated with TDF / FTC + LPV / rshowed previously undiagnosed co-morbidities. There is a need for the countryHIV programme to adopt routine monitoring of blood pressure, lipids, glucose,and creatinine.

No conflict of interest

Abstract: 10

Antiretroviral Treatment and HIV Care, Comorbidities

Current profile of dermatological diseases and events during HIV in Dakar

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Introduction: In all developing countries, dermatological pathologies represent a major problem in public health. The objective of this work is to study epidemiological and clinical aspects of dermatological diseases and events encountered in patients living with HIV (PLHIV).

Materials and Methods: This retrospective study concerned all PLHIV hospitalized in an Infectious Diseases Department of Dakar from 1 January 2012 to 31 December 2014, aged up to 16 years and having a dermatological lesion.

Results: Seven hundred and forty-nine PLHIV including 695 HIV-1 showed dermatological damage. The majority (459 or 86.6%) had severe immunosuppression (CD4 count <200 / mm3). Among them, 1600 skin damage which were collected 1090 infectious origin and 510 non infectious. Among infectious dermatological damage, mycotic diseases dominated with 745 cases (78.2%), followed by bacterial infections with 43 cases (4.5%); viral infections with 92 cases (9.7%), parasitic diseases with 16 cases (1.7%). In 57 cases (6%) they were not specified. Bacterial dermatological diseases consisted of skin abscesses and vaginosis respectively in 14/43 cases (32.6%), followed by impetigo (3 / 43 cases or 7%). Among viral dermatological diseases, Kaposi's sarcoma was predominant with 47/92 cases (51.1%) followed by herpes with 32/92 cases (34.8%) and fowlpox with 8/92 cases (8.7%). As for the parasitic dermatological affections, they were represented by scabies (13/16 cases 81.3%). The dermatological fungal diseases, were dominated by oral candidiasis (587/745 cases or 78.8%), followed by tinea skin (34/745 cases or 4.6%) and ringworm (21 / 745 cases or 2.8%). Besides infectious dermatological diseases, sexually transmitted infections (STIs) by ulceration and flow were respectively found in 53 cases (47.7%) and 52 cases (46.8%); tumor lesions in 6 cases (5.4%). Among the STI with ulceration, genital herpes was to meet with 35/53 cases (66%). Vaginal discharges were made by two cases of *Trichomonas vaginalis* infections (2/52 or 3.8%). The genital warts were six cases of STIs by tumor lesions. Twenty six cases of cutaneous events in infectious diseases were found. These events were bacterial (17 cases or 65.4%) and viral (2 cases or 7.7%); seven patients, they were not specified. Dermatological events in the bacterial diseases were dominated by glandular tuberculosis fistulized to skin (nine cases) followed by cutaneous tuberculosis (three cases). Dermatological events were associated with two cases of viral diseases namely herpes meningoencephalitis and viral hepatitis B. Among the noninfectious dermatological diseases encountered in PLHIV, silky trichopathy was most represented (208 cases or 40.8 %), followed by prurigo (167 cases or 32.7%), skin xerosis (77 cases or 14.3%) and drug reactions (14 cases or 2.7%). In our cohort, 316 PLHIV (42.2%) were receiving antiretroviral therapy at the onset of dermatological damage and one case of drug eruption associated with Nevirapine was noted

Conclusion: Dermatological events still play an important role in HIV in Dakar and mycotic skin diseases are the most common.

No conflict of interest

Abstract: 11

Antiretroviral Treatment and HIV Care, Comorbidities

Quality of life among HIV/AIDS patients on anti retro-viral therapy at Letlhakane primary hospital (Botswana): a cross sectional study

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Introduction: The scale up of anti retro-viral program in Sub-Saharan Africa has substantially led to reducing HIV/AIDS morbidity and mortality and has ultimately increased patients survival.
To date,there is a paucity of data concerning the impact of this life saving intervention on patients life and their health related quality of life.

Material and Methods: This cross sectional study was conducted using a convenience sampling method on 299 on ARV at Letlhakane Primary Hospital during the second half of 2015.The WHOQOL HIV BRIEF instrument in English and Setswana were used for data collection. Quality of life scores for each domain were obtained by rescaling the six domains from 4 to 20,with 20 being the most favorable. Adherence scores were calculated by the pill count method(based on previous supply) and patients who scored 95% or more were considered as adherent and those who scored less than 95%were classified non-adherent. Descriptive and inferential statistics were performed using SPSS(version 20.0).

Results: A total of 299 patients were interviewed by a trained research assistant between the 1 September 2015 and 21

December 2015.Of these; female represented 53.8% (161).The mean age was 41.6 years with a range from 5 to 85 years. However 16% were illiterate,53.5% were single;14.7% were married and 24.4% were living as married.
The highest overall mean score of quality of life was recorded for the spiritual domain(17.1) while the environmental domain registered the worst score(14.8).Moreover ,the mean score for the physical and psychological domains were 16.9 while the level of independence and social relationship scored respectively 16 and 16.5.
Having received a tertiary education was significantly associated with a high overall mean score of quality of life(p=0.003) while there was no significant association between the gender and the quality of life core. However, younger patients(35 years or less) had a significantly lower score compared to their elder counterparts(p=0.01).Participants' quality of life was significantly associated with their adherence level; patients recording an adherence of 95% or more had a higher score of quality f life.

Conclusion: Improved quality of life and good adherence to ARV medications are keys to a successful Anti retro-viral program as they mutually potentiate each other. Therefore, a multidimensional approach taking into consideration different aspects of patients life (spiritual, psychological, environmental,.)should be encouraged to assure and maintain the efficacy of this life-saving intervention.

No conflict of interest

Abstract: 12

Laboratory monitoring / diagnostics

Maximizing EID opportunities using the DBS Mentor Approach in Rural HIV Clinics in South-Eastern Nigeria

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Background: Pediatric HIV services in Nigeria lags behind that of adult services despite huge national effort to scale up services for HIV infected children. One of the challenge has been limited access to HIV pediatric services occasioned by inadequate HIV screening among children and poorly integrated Early Infant Diagnosis (EID) program. The link between the prevention of mother to child transmission of HIV program and pediatric services is weak due to poor knowledge in Early Infant Diagnosis among health care workers especially in the rural areas where majority of Nigerians live.

Materials & Methods: 35 Community Health workers who were trained as Dry Blood Samples (DBS) mentors in January, 2014 at rural HIV clinics in Ebonyi, Enugu and Imo States, South-Eastern Nigeria in order to address low EID services uptake. These Community health workers were mentored on proper method of collection, drying, packaging, storing, documentations as well as transportation of DBS to the PCR reference laboratory and charged with cascading the training to facility staff involved in the PMTCT/pediatric programs; collecting DBS while doing so. The collected DBS were transported to the nearest DNA PCR reference lab for analysis. Data obtained from the EID activities were documented using a generic DBS tracking tool. These data were collated and analyzed using Microsoft excel and SPSS data package.

Results: 3 months prior to the intervention, 20 HIV Exposed Infants delivered in the facilities had DBS collected and transferred to the DNA PCR reference lab out of which 2 results were received from the reference lab. Post intervention, 123 HIV Exposed Infants delivered

in the facilities had DBS collected and transferred to the reference lab out of which 35 results were received from the reference lab.

Conclusions: Building the capacity of the Community Health workers on DBS collection and transfer to the DNA PCR reference lab resulted in the observed increase in Early Infant Diagnosis at the rural HIV clinics.

No conflict of interest

Abstract: 13

Pediatrics

Model-based pediatric dosing of ritonavir-boosted Darunavir: an alternative to WHO guidelines

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Introduction: More treatment options are needed for antiretroviral (ARV)-experienced pediatric patients with HIV. Approved pediatric dosing regimens for ritonavir-boosted darunavir (DRV/rtv) differ from those recommended by the World Health Organization (WHO), as different weight bands have been used. To simplify administration of ARV drugs, WHO recommends 5 weight bands from 10 kg to ≥35 kg and a constant 6:1 ratio of darunavir to ritonavir, which allows simpler DRV/rtv fixed-dose combinations (FDCs). The approved (United States Package Insert) regimen uses 8 weight bands from 10 kg to ≥40 kg, and DRV:rtv ratios ranging from 7.5:1 to 5.8:1. This pharmacokinetic (PK) simulation was conducted to evaluate a regimen that conforms with the WHO weight bands and constant DRV:rtv ratio, while reaching DRV exposures comparable to those in adults thereby allowing extrapolation of safety and efficacy to pediatric patients.

Material & Methods: A population pharmacokinetic model of DRV/rtv has been previously established based on rich pooled sampling data from adult and pediatric populations. Simulations were performed using both R (version 12) and NONMEM software (version 7.1), with a G Fortran compiler. Pediatric b.i.d. dosing regimens using WHO weight bands and a fixed 6:1 DRV/rtv ratio (240/40mg FDC) were determined, which target (80 – 130%) the exposure (AUC, area under the curve) observed in ARV-experienced adults on DRV/rtv 600/100mg b.i.d.. These were also compared to the exposure expected with the approved regimen and weight bands with DRV and rtv as separate agents.

Results: The simulated AUC while applying the current WHO recommended dosing was below 80% of the adult reference value of 62.3 µg*h/ml in the lower weight band of 14 to <20kg (1 pediatric tablet [240/40mg]) and above 130% of the adult reference value in the weight band of 25 to <35kg (1 adult tablet [600/100mg]), while the other weight bands were more comparable. Further simulations of AUC and pharmacokinetic profiles after administration of DRV/rtv as 240/40mg tablets allowed selection of a new dosing schedule that reached DRV exposures between 80% and 130% of the adult reference value in all WHO weight bands: 1 tablet [240/40mg] for 10kg to <14kg; 1.5 tablets [360/60mg] for 14kg to <20kg and 20kg to <25kg; 2 tablets [480/80mg] for 25kg to < 35kg; and adult dose as of 35kg). These exposures were also comparable to those anticipated with the approved DRV/rtv regimen.

Conclusions: Population PK modeling can help guide effective and practical pediatric ARV regimens. These simulations suggest that DRV dosing according to current WHO guidelines might lead to either under-dosing in a lower weight band or over-dosing in a higher weight band. Simple changes to the current WHO recommended dosing schedule could improve DRV exposure in children while still keeping to the number of weight bands and a standard DRV/rtv dosing ratio. Manufacturers could thereby simplify treatment by developing DRV/rtv FDCs which allow dosing aligned with recommendations across the unified WHO weight bands.

Conflict of interest: Full-time employee of Janssen, Pharmaceutical Companies of Johnson & Johnson.

Abstract: 14

Women and HIV

Getting pregnant in antiretroviral clinical trials: women choice and safety needs. Experience from the ANRS12169-2LADY and ANRS12286-MOBIDIP trials

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Introduction: Pregnancy is a non-inclusion criteria in most clinical trials involving antiretroviral treatment (ART) and modern contraception methods are systematically proposed to women of childbearing age. Nevertheless pregnancies are often observed. Reproductive choices during clinical trials should be understood to adapt interventions to the risk for mother and baby safety. Our goal was to describe the reproductive behavior and pregnancy outcomes among HIV-infected women on second line antiretroviral therapy enrolled in two clinical trials and to compare them with those of HIV-positive women in non-research settings.

Material & Methods: The number and outcomes of pregnancies were recorded among 282 non menopausal women enrolled in the ANRS 12169-2LADY and ANRS 12286-MOBIDIP clinical trials in Cameroon, Senegal and Burkina Faso. All participants had agreed to use at least one contraceptive method (barrier or non-barrier) which was provided freely during the study. Data were collected through revision of notification forms and by data extraction from the study database, regularly updated and checked during the study.

Results : Sixty five women had 84 pregnancies between January 2010 and July 2015 resulting in a pregnancy rate of 8.03 per 100 women-years (WY) of follow-up (95% CI 6.48-9.94) which is similar to those observed in HIV cohort studies in Sub-Saharan Africa (varying from 2.5 to 9.4 pregnancies per 100 WY). Among 54 live births, 8 (14.8%) babies were born prematurely and 7 (13%) had a low birth weight. Sixteen miscarriage/stillbirths occurred (21%). This percentage is comparable to the one expected in the seronegative population which is reassuring for HIV-positive women considering pregnancy on ART. Only one minor birth defect was diagnosed. In univariate and multivariate analysis, unproductive pregnancy was not associated either with age, nadir of CD4 count, duration of ART, CD4 count or viral load at the beginning of pregnancy.

Conclusion: The request to avoid pregnancy during a clinical trial is not respected by women participants in Sub-Saharan Africa. It is therefore essential to adopt a pragmatic approach by re-evaluating the relevance of the criteria for non-inclusion/exclusion of pregnant women according to the risk associated with exposure and to seek more effective and innovating contraceptive strategies when using potentially teratogenic molecules.

No conflict of interest

Abstract: 15

Prevention of Mother to Child Transmission

Retention in care among HIV-infected pregnant mothers on lifelong antiretroviral therapy (art) in Uganda

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Background: In an endeavour to improve maternal health and survival, as well as reduce vertical transmission of HIV in Uganda, lifelong ART is provided to all HIV-infected pregnant mothers (Option B+) irrespective of CD4 count or clinical stage. However, retention in care among HIV-infected pregnant mothers is unknown but suspected to be low. We evaluated retention in care and explored reasons why mothers drop out of care.

Materials and Methods: We performed a retrospective cohort analysis of data abstracted from health facility records of 2,169 pregnant mothers who had enrolled on ART between January and March 2013 in a representative sample of 145 health facilities in all 24 districts in the central region of Uganda. Using survival analysis, we calculated retention in care at 6, 12 and 18 months post-ART. To explore reasons why mothers drop out of care, we performed 21 in-depth interviews (IDIs) with mothers who dropped out, 21 IDIs with mothers who were retained in care and 29 focus group discussions (FGDs) with peer mothers and village health team (VHT) members.

Results: The overall median follow-up time after enrolment on Option B+ was 20.2 months (IQR 4.2-22.5). The proportion of mothers retained in care at 6, 12 and 18 months post-ART was 74.2%, 66.7% and 62.0%, respectively. Retention in care at each time point varied considerably by health facility level and was highest among mothers seen at hospitals and lowest among those seen at lower level facilities ($p<0.05$). Mothers who dropped out of care expressed concerns about fear of disclosure of HIV status and resulting stigma; insufficient partner support; difficulty with transportation to clinics; by poor provider attitudes and stock outs of ARV drugs. In addition, VHT members and peer mothers complained about inadequate support to track mothers in the community.

Conclusion: Retention in HIV care in this population is moderate. Poor provider attitudes, high levels of stigma and discrimination in the community, stock-outs of ARV drugs and barriers to transportation to clinics are some of the factors that could undermine the program and need to be addressed.

No conflict of interest

Abstract: 16

Antiretroviral Treatment and HIV Care, Comorbidities

Immunologic Criteria are Poor Predictors of Virologic Outcomes: Implications for HIV Monitoring in a Large Treatment Program in Nigeria

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Background: Nigeria has made significant gains in scaling-up access to HIV prevention, treatment and support services and by the end of 2014, provided antiretroviral therapy (ART) to over 747,382 individuals and care and support to almost 1.5 million people. The main objective of this study was to determine predictors of immunologic failure in the absence of routine viral load monitoring.

Methods: This was a retrospective cohort study of 12,456 HIV-infected patients enrolled into HIV care at the University of Abuja Teaching Hospital (UATH) between February, 2005 and December, 2014. Immunologic failure defined as having a decrease in CD4 cell count to pre-therapy baseline level (or below) or persistent CD4 levels <100 cells/mm3 after 6 months on therapy. HIV genotyping was performed on a subset of patients with two consecutive Viral Load (VL) measurements >1,000copies/ml after at least 6 months of ART. The incidence of immunologic failure was determined as the percentage of cases among all patients enrolled in the treatment program. To identify predictors of immunologic failure, univariate and multivariate analyses were performed using log binomial models to estimate relative risks (RR) and confidence intervals. All available plausible predictors were included in the multivariate models if they were significant at a P value of <.20. The criterion for significance for all analyses was a 2-sided P value of <.05. All

statistical analyses were performed with the statistical software package SAS release 9.3 (SAS Institute Inc, Cary, North Carolina).

Results: A total of 5,928 patients who initiated ART were included in the analysis. The entry point for 3,924 (66.2%) was through (Voluntary Counseling and Testing (VCT)), 3,468 (58.5%) were initiated on NVP-based containing regimen and 2,140 (36.1%) initiated on TDF, baseline CD4 was 268±23.7 cells/ul, and mean VL was 3.3±1.3.log10copies/ml. Among 2,602 patients with immunologic failure, 868 (33.3%) had VL measurements and 381 (43.9%) of these had a detectable VL. Fifty six samples (56/198; 28%) had no resistance; 160 (80%) harbored NRTI resistance; 151 (76.3%) M184I/V; 29 (14.6%) had ≥ 3 TAMs, and 37 (18.7%) had K65R, of which all were on TDF. One hundred and sixty-two samples (81.8%) harbored NNRTI resistance; 72 (36.4%) Y181C and 68 (34.3%) K103N with 53 % having ≥ 2 etravirine associated mutations. Service entry point [RR (95%CI): 0.79 (0.64–0.91); p<0.001]; being on NVP containing regimen [RR (95%CI): 1.21 (0.99 – 1.45); p=0.023]; WHO stage III or IV [0.76 (0.60 – 0.96); p=0.013]; baseline CD4 cell count <200cells/ul [0.19 (0.16 – 0.22); p<0.001]; and male gender [1 (1.07 – 1.40); p=0.005] were associated with immunologic failure.

Conclusions: Immunological criteria for failure erroneously classified patients without virological replication as failing therapy in our program. Patients with both virologic and immunologic failures had extensive accumulations of drug resistance mutations. This erroneous classification is exacerbated by lack of diagnosis testing that limits provider's ability to rule out tuberculosis, opportunistic infection or other potential causes of depressed CD4 counts.

No conflict of interest

Abstract: 17

Antiretroviral Treatment and HIV Care, Comorbidities

Factors associated with virologic failure in HIV infected individuals in Mansa district, Zambia

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Background: With the fast-track UNAIDS 90-90-90 targets by 2020, the Ministry of Health has expanded viral load testing to at least 5 of the 10 Provincial General Hospitals in Zambia. In the Zambia Consolidated HIV Guidelines (2013), virologic failure is defined as a viral load test result above 1000 copies/mL after at least 6 months of antiretroviral therapy. This evaluation assesses factors associated with virologic failure in patients receiving combination Antiretroviral therapy (cART) in rural Zambia.

Methods: Using a cross-sectional design, data were collected from patient records at Senama, Central and Buntungwa Clinics in Mansa district, Luapula Province for patients on cART for at least 6 months with at least one viral load test between October and November 2015. Variables in our analysis included: age, sex, current ART regimen, viral load, duration of cART, education level, occupation, baseline CD4 and World Health Organization (WHO) clinical stage. We used multivariable logistic regression to determine factors associated with virologic failure. Adjusted odds ratio (aOR) and the corresponding 95% confidence intervals (CI) were obtained and reported.

Results: 224 patients were included in the analysis; 157 (70.1%) were female. Median age was 38.0 years (Interquartile range (IQR): 6 - 62]. 209 (93.7%) were taking Tenofovir, Emtricitabine/Lamivudine and Efavirenz. 131 (61.5%) were on cART for over 2 years. Overall, 202 (90.2%) had viral load less than 1000 copies/ml, of which 174 (77.7%) had undetectable viral load (<50 copies/ml). 22 (9.8%) patients had virologic failure. Most of the virologic failure occurred in children below 15 years, among whom 6 (40%) had viral load above 1000 copies/ml. Patients aged 30-44 years were 80% less likely to have virologic failure compared to children below 15 years (aOR=0.2; 95% CI [0.06, 0.69]). All patients with virologic failure were taking 2 nucleoside reverse transcriptase inhibitors with a non-nucleoside reverse transcriptase inhibitor (p<0.001). Patients on ART for more than 2 years were more likely to have virologic failure

compared to those on ART for 1-2 years (aOR=8.8; 95% CI [1.03, 74.65]).

Conclusions: The findings suggest that virologic failure is most common in children on non-nucleoside reverse transcriptase inhibitor based regimens, possibly due to prior nevirapine exposure in PMTCT programs. These findings support the decision to include lopinavir/ritonavir as part of the first line treatment in combination with 2 nucleoside reverse transcriptase inhibitors for nevirapine-exposed children in Zambia. Virologic failure is not uncommon in this sample of patients and warrants further focus if we are to assure that 90 % of patients on cART achieve viral suppression.

No conflict of interest

Abstract: 18

HIV Prevention

Finding the first 90% to achieve epidermic control

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Introduction: Zambia has made great strides in addressing its HIV/AIDS burden but achieving epidemic control will require reaching greater numbers of HIV+ individuals through focused HIV Testing and Counseling (HTC) services. One such approach is conducting door to door testing in high HIV burden districts. In collaboration with the Ministry of Health (MOH), we tested the effectiveness of using door to door HTC in Chilabombwe District, Copperbelt Province, Zambia. We assessed HTC uptake and the relative yield of people living with HIV (PLHIV).

Method: Using purposive sample in high density areas, we conducted prospective cross sectional quantitative assessment from June to December, 2015 of all HTC tests in Lubengele and Kakoso communities in the above referenced districts. Community based volunteer counselors received training and visited clients door to door. After obtaining written consent, clients had the option of receiving HTC services in their homes. Clients were tested using the Determine rapid tests, with Uni-gold used as the confirmatory test and repeat tests conducted in the laboratory for quality assurance purposes using both tests. Once tested HIV positive, clients were referred from the community to the facilities for HIV treatment, care and support.

Results: Following the intervention, 121 clients were diagnosed with HIV out 8,322 clients tested. (Positivity rate of **1.5%**). Women were more likely to be infected with HIV as compared to their male counterparts, 63 % of women versus 37% of men. Among those who tested positive, 99 (81.9%) reached the facility and were linked to treatment, care and support in either in the participating facilities or another health facility; 60.9% were eligible and initiated immediately on combination antiretroviral therapy (cART); 22 (18.2%) did not reach any facility. The positivity rate for facility based testing was at **3.2%** for the same period.

Conclusions: This intervention led to increased access to HTC services in the targeted communities. And, the intervention was successful in linking PLHIV to care. However, the relatively low yield as compared to the testing done at facilities raises questions about the cost effectiveness of door to door HTC in these high burden communities. More work is needed to devise the optimal strategies for reaching the first 90 %.

No conflict of interest

Abstract: 19

Key Populations: prevention and treatment challenges

Operational research studies among MSM in Cameroon: Linkage to treatment challenges

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Background: Across West and Central Africa, men who have sex with men (MSM) have been consistently found to bear a high incidence and prevalence of HIV. Moreover, in contrast to Eastern and Southern Africa, the high burden of HIV is observed in the context of more moderate HIV epidemics observed among all reproductive age adults with prevalence generally under 2-5%. The 'HIV/AIDS Prevention Program (HAPP) implemented from 2010 to 2014by CARE and ACMS in four cities in Cameroon,was to improve the perception of HIV risk among key population and their access to appropriate and good quality HIV prevention services.From Research to prevention (R2P) studyconducted in 2013by Global Viral(GV) and Johns Hopkins University (JHU)was to provide relevant information that could be used to improve HIV prevention among men who have sex with men (MSM).In the framework of the Continuum of prevention, Care and treatment with most at risk population, Care-USA, Metabiota, Johns Hopkins University in partnership with Cameroonian (CBOs) delivering services for KP and in collaboration with National AIDS Control Committee are currently conducting an integrated biological and behavioral survey that will serve as baseline data for a 2-year longitudinal study.

Methods: A sample of 2636 TS and 1256 HSH, 18 years or older, will be recruited into the study using respondent-driven-sampling (RDS) in 13 districts within 5 regions in Cameroon. A comprehensive structured survey instrument and biological testing for HIV, syphilis will be administered with the objective of assessing knowledge, attitude, behavioral and biological factors associated with HIV and Syphilis infections among FSW and MSM and translate into programmatic interventions.

Results: MSM in Yaoundé: To date, 306 MSM and 576 FSW, 18 years or older participated to the study in Yaoundé. 138/306 (44.6%) were found to be living with HIV, with less-than-half(44.9%,n=62/138) reported knowing their HIV, 34.1%(n=47/138) reported to have ever had a CD4 test, while 36/138 (26.1%) reported to have initiated ART. Of these 36 participants who ever initiated ART, 35 are currently on ART. In total, 35/138(25.4%) who were found to be living with HIV, reported being on ART (Fig. 1: HIV Cascade among MSM in Yaoundé)

Conclusions: At baseline, there is limited uptake of antiretroviral therapy (ART) and with unknown levels of viral suppression among MSM. Baseline data highlighted significant amounts of stigma limiting access to HIV treatment highlighting the need for comprehensive interventions to optimize ART among this population.

No conflict of interest

Abstract: 20

HIV Prevention

Pre-Clinical Evaluation of optimized Immunogens targeting the neutralizing epitopes in MPER of HIV envelope Glycoprotein

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Introduction: Due to its unique challenge of establishing lifelong reservoirs a successful HIV-1 vaccine must elicit protective antibodies responses at the portals of entry. Broadly neutralizing antibodies (bnAb) have been demonstrated not only to be therapeutic through suppressing viremia in HIV-1 infected people but also preventive in blocking HIV-1 infection in

animal models. This implies that a desirable HIV-1 vaccine candidate should be able to induce HIV-1 specific bnAb with an extensive ability to neutralize a broad range of HIV-1 isolates. Although several bnAb are known to target conserved regions in the HIV-1 envelope glycoprotein no vaccination strategy has successfully produce such antibodies. The menbrane external proximal region of HIV-1 envelope gp41 (MPER) bears several conserved broadly neutralizing epitopes. However a formidable challenge has remained the ability to optimize and deliver HIV envelope immunogens that can induce MPER restricted bnAb. We have developed and evaluated novel immunogens targeting broadly neutralizing epitopes in MPER of HIV gp41

Methods: Using selective surface engineering and evolutionary phage display we incorporated the entire MPER on the surface of Qbeta. To verify if the four HIV-1 bnAb epitopes were displayed on the surface of the phage we performed antibody-antigen ELISA for specific recognition by the four bnAb Z13e1, 2F5, 4E10 and 10E8 which target linear epitopes within the MPER. Next in sero-abundance assay we assess for MPER specific antibodies in plasma collected from 348 antiretroviral naïve HIV-1 infected participants of the CIRCB AFRODEC cohort from 2011 to 2015. Plasma from 20 healthy control was used as the negative control. Finally the persistence of MPER specific antibodies was measured and correlated with viral load and CD4 T cells over a period of five year. SPSS was used for statistical analysis.

Results: All four MPER specific antibodies could recognize their respective epitopes on the surface of the Qbeta-MPER virus like particles. Well over 87% of the participants showed MPER specific antibody responses with optical density (OD) ranging from 0.2 to 2.5 when normalized against background. When categorized according to OD 11 % (37/348) of participants had anti-MPER antibodies with ODs above 1, 37% (127/348) participants show ODs ranging from >0.5 to 1, 40% (139/348) showed ODs ranging from >0.3 to 5 and 13 % (45/348) showed anti-MPER antibodies with ODs less than 0.3. There was neither correlation between MPER specific antibodies and Helper CD4 T cells count no HIV-1 plasmatic viral load. MPER specific antibodies persisted at higher titers (OD>1) in 11 % (37/348) of the participant. Compared with the prevalence of anti-HIV gp120 and anti-gagp24 specific antibodies in the same plasma MPER specific antibodies were significantly less ($P<0.0001$) and generally of lower titres.

Conclusion: Thus we made new MPER based immunogens which can be used to monitor MPER specific immune responses in clinical samples. They can also be used as immunogens for mucosal vaccination either alone in combination with other vaccine delivery strategies.

No conflict of interest

Abstract: 21

Epidemiology

Identification of Rare HIV-1 Group N and HTLV-3 Strains in Rural South Cameroon

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Background: South Cameroon is a hot spot for newly emerging strains of HIV and HTLV, making this region a critical location for monitoring circulating variants that have the potential to spread globally. In this study we aim to monitor the prevalence and diversity of HIV and HTLV, as well as detect emerging viral strains by conducting surveillance of HIV and HTLV in South Cameroon, which can inform diagnostics and research.

Methodology: Study participants, recruited in 7 towns in South Cameroon, were screened for HIV infection using the national algorithm from 2010-2015. All collected specimens from 2010 were selected for further testing; however, in 2011-2015 the selection was weighted to include 30-40% HIV positive specimens. All selected specimens were tested with ARCHITECT HIV Ag/Ab Combo assay (Abbott Diagnostics), and a subset with remaining volume was tested with ARCHITECT rHTLV I/II

assay. HIV serotype was determined by a peptide multiplex immunoassay, which classified HIV infections as either HIV-1 group M, N, O or HIV-2. Molecular characterization was performed on a subset of reactive HIV and HTLV specimens.

Results: In 2010, the prevalence of HIV in South Cameroon was 8.5% amongst study participants. The serotype immunoassay identified the majority of HIV infections in 2010-2015 as Group M (99%); Group O (n=22) and Group N infections (n=2) were also identified and confirmed by sequence classification of env gp41 or pol-integrase regions. Based on env gp41, gag, and/or pol-integrase sequences from 415 HIV-1 Group M specimens, CRF02_AG accounted for 62.6% of HIV infections; 6 subtypes, 11 CRFs and 21 URFs were found. From 2010-2015, the prevalence of HTLV was 1% (95% confidence interval: 0.70-1.33) in the study population, with no significant effect of HIV co-infection. Sequence classification of the tat and/or gag region identified HTLV-1 (n=32), HTLV-2 (n=5), and HTLV-3 (n=1) infections.

Conclusions: Our findings confirm that South Cameroon has a high burden of HIV infections and indicate a high level of HIV-1 and HTLV strain diversity in the region. Only 4 previous HTLV-3 infections have been reported to date, making our identification of a new HTLV-3 infection of great significance. Likewise, the two HIV-1 Group N infections we are reporting are 9% of the 22 total Group N infections reported. Continued HIV/HTLV surveillance in South Cameroon will be essential to ensure diagnostic tests and HIV research keep pace with these rapidly evolving viruses.

No conflict of interest

Abstract: 22

Epidemiology

HIV-1 group O infection in Cameroon from 2006 to 2013: prevalence, genetic diversity, evolution and public health challenges

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Background: The human immunodeficiency virus, HIV, is characterized by a tremendously high genetic diversity, leading to the currently known circulating HIV types, groups, subtypes, and recombinant forms. HIV-1 group O is one of the most diverse forms of HIV-1 and has been so far related to Cameroon or individuals originating from Cameroon. The goal of this study was to investigate the evolution of this viral group, in terms of prevalence, genetic diversity and public health implications in Cameroon.

Materials & Methods: We collected HIV-1 positive samples in Cameroon from 2006 to 2013, including samples from ART naïve and ART experienced patients. We serotyped all samples using HIV type 1 and 2, HIV-1 group M, N, O and P specific peptides. We genetically characterized all samples reacting with HIV-1 group O or with both M and O peptides to confirmed group O strains and identify recombinant forms. We analyzed the new HIV-1O strains for the presence of natural resistance to integrase inhibitors. Finally, we estimated the phylogenetic relationships and past population dynamics of newly characterized and previously reported HIV-1 group O to assess the current diversity and the evolution over time.

Results: Our results confirmed a low prevalence, around 0.6%, of HIV-1 group O in this country, indicating that the frequency of this virus in Cameroon remains stable over the last

decades. However, we found an extensive high genetic diversity within this HIV-1 group, but the current distribution of the circulating viral strains still does not allow classification as subtypes. The frequency of dual infections with HIV-1 group M and group O was 0.8%, but we found no recombinant forms in co-infected patients. Natural resistance to integrase inhibitors was not identified, although we found several mutations considered as natural polymorphisms.

Conclusion: Our study shows that infections with HIV-1 group O can be adequately managed in countries where the virus circulates, but this complex virus still represents a challenge for diagnostics and monitoring strategies.

No conflict of interest

Abstract: 23

Key Populations: prevention and treatment challenges

The effect of antiretroviral naïve HIV-1 infection on the ability of autologous NK cells to produce IFNg unpon exposure to Plasmodium falciparum- infected Erythrocytes

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Background: In sub saharan Africa, regions of intense plasmodium species transmission coincides with areas of high prevalence of HIV-1 infection. This implies that antiretroviral naïve HIV-1 infected people living within this region are repeatedly exposed to malaria. Natural Killer cells(NK cells) are known to contribute to malaria immunity either through the production of IFNg (interferon gamma) upon exposure to Plasmodium falciparum-infected erythrocytes (iRBC) or direct lysis of iRBC. However in antiretroviral naïve HIV-1 infection several functions of NK cells including cytokine production and cytolysis are affected. In this study we assess the ability of NK cells from antiretroviral naïve HIV-1 infected people to respond to autologous iRBC. Our hypothesis being that untreated HIV-1 infection could dampen NK mediated immune responses to malaria.

Material and Methods: Firstly, iRBC were enriched using peripheral whole blood from malaria infected participants and cultured for 72 hours. Next NK cells purified from peripheral blood mononuclear cells (PBMCs) of 15 Anti-retroviral naïve HIV-1 infected people and 15 healthy controls were cocultures with the iRBC for 24 hours. NK cells IFNg production was measured by multiparametric flowcytometry using BD FACScanto II machine and data analyzed by flowjo 10 tristar. SPSS was used for statistical analysis.

Results: Our data show a significant reduction ($p=0.02$) in IFNg production by NK cells from antiretroviral naive HIV-1 infected people after co-culture with *plasmodium falciparum* infected RBCs. This was in contrast with NK cells response from healthy controls which demonstrated elevated IFNg production upon exposure to iRBC. This IFNg production of NK cells from untreated HIV-1 infected participants correlated inversely with the viral load ($r = -0,9$). NK cells from both groups cocultured with uninfected erythrocytes (uRBC) yielded significantly less ($p<0.01$) IFNg production clearly indicating that this response was iRBC dependent.

Conclusion: Thus antiretroviral naïve HIV-1 infection can dampen NK cell mediated immunity to Plasmodium falciparum infection in malaria intense regions. This could in effect escalate morbidity and mortality in people chronically infected with HIV-1.

No conflict of interest

Abstract: 24

Laboratory monitoring / diagnostics

Evaluating plasmatic biomarkers as disease signatures for the point of care monitoring of HIV-1 and comorbidies in resource limited regions

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Introduction: The hallmark of HIV-1 infection is sustained immune activation which is usually accompanied by several immune dysregulations. In sub-Saharan Africa with intense comorbidities this is further compounded by intercurrent diseases which exacerbate not only the inflammation but equally accelerate immune deterioration. The object of this study was to assess the independent contribution of plasmatic biomarkers in predicting the disease state of HIV-1 infected people. This should allow the development of point of care kits which can be used for the biological monitoring of HIV-1 infection in remote areas of resource limited countries.

Method: Multiparametric Flowcytometry and beads array were used to monitor 18 cytokines/chemokines in plasma from 450 HIV-1 infected people and 79 healthy controls including 14 from Europe and Asia. Concurrently participants were also monitored for coinfections with Plasmodium species, HBV, HCV, TB and Dengue virus. Spearman correlation was used to determine the relationship between disease signature and biomarker.

Results: The majority of HIV-1 infected participants (72 %) was antiretroviral naïve and has been part of the CIRCB AFRODEC cohort for at least two years. Plasmatic cytokine/chemokine levels were generally significantly higher ($p<0.001$) in plasma from healthy controls from Cameroon than levels of healthy controls from Europe and Asia. Plasmatic levels of Human –IP10 (CXCL10) and Human MIG (CXCL9) were significantly higher ($P<0.0001$) in antiretroviral naïve HIV-1 infected people than in healthy controls. These values increased significantly in the context of malaria and/or TB coinfection clearly indicating that Plasmodium species and TB infections can escalate inflammatory chemokine in antiretroviral naïve HIV-1 infected people. More so augmented values of IL-8 and Human MCP-1 were also observed in the context of dual malaria-HIV-1 infection. Dengue virus-HIV-1 coinfection in contrast did not produce a significant increase in the above mentioned chemokines.

Conclusion: There were differences between antiretroviral naïve HIV infected participants and healthy controls with respect plasmatic chemokines and cytokines.Thus optimizing inflammatory biomarkers such as CXCL10 , CXCLP9, IL-8 and MCP-1 should allow clinicians in resource limited settings to monitor immune activation during HIV-1 infection alone or in the context of coinfections.

No conflict of interest

Abstract: 25

Basic Science

Immune reconstitution and skewed responses after ART initiation in HIV infected Ugandans

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Background: During HIV infection, several soluble and cellular biomarkers of immune activation increase and remain at higher levels throughout infection. Chronic immune activation is a key feature of HIV infection but much about its relationship to disease progression remains unclear. The present study sets out to understand the factors driving chronic immune activation in HIV infection under antiretroviral therapy (ART).

Methods: Longitudinal evaluation of multiple soluble and cellular biomarkers of immune activation was performed in a cohort of chronically infected Ugandans before and after start of ART. Soluble biomarkers measured in plasma included markers for microbial translocation (IFABP, LPS, sCD14), coagulation (D-dimer) as well as 20 cytokines or chemokines of innate and adaptive cell function. Cellular responses were measured both in PBMC and LN, before and after ART, including frequencies of various innate and T cell subsets, particularly follicular helper T cell (T_{FH}) subsets in LN. Sorted cells underwent deep sequencing for transcriptome analysis.

Results: Soluble biomarkers showed a characteristic decline within the first two weeks on cART initiation but then fluctuated markedly over a 12-month period. A delayed transient decrease of exclusively innate cytokines / chemokines such as IL-6, IL-8, MIP1-b was paralleled with transient peaked levels of several T cell function cytokines at month 4; preceding month 12 levels higher than baseline for a number of both innate and T cell cytokines (e.g IL-6, IL-8, IL17, TGFb). While frequencies of memory T cell subsets changed and cellular activation in PBMC was reduced a few months into treatment (e.g. HLA-DR+ T cells), T cell activation and frequencies of T_{FH} subsets in the LN showed a high degree of similarity before and after ART. Lowered expression of several genes related to immune responses against virus (eg. ISGs) and increased in expression of genes involved in responses against bacteria and fungi, suggest a covert skewing of responses during immune recovery; with significant impact on immune activation.

Conclusion: Our study shows strong fluctuations of soluble markers of immune activation in HIV infected Ugandans upon ART start. With the exacerbated levels of several cytokines, our data raise the possibility that on initiation of ART and immune reconstitution, responses to other pathogens can lead to resurgence of immune activation without overt clinical manifestations.

No conflict of interest

Abstract: 26

Antiretroviral Treatment and HIV Care, Comorbidities

Outcomes of second-line therapy in HIV positive adults attending for routine care at Yaoundé Central Hospital

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Introduction: There exists limited data on the virological outcome of patients receiving protease inhibitor (PI)-based antiretroviral therapy (ART) in the absence of routine viral load monitoring in sub-Saharan Africa. The aim of this study was to determine the virological status of HIV-positive patients established on second-line therapy with two NRTIs plus ritonavir-boosted lopinavir and attending for routine care at Yaoundé Central Hospital.

Methods: The study population comprised consecutive adults attending out-patient care while established on the national standard second-line regimen for ³6 months. Demographic and clinical data were obtained from medical records and through patient interview and examination. Venous blood was collected for measuring plasma HIV-1 RNA levels using the Biocentric assay (routine test, lower limit of detection 60 copies/ml) or the Abbott Real-time assay (group O strains, lower limit of detection 40 copies/ml). Viral load

testing was performed at Centre Pasteur of Cameroon in Yaoundé.
Results: The study population comprised 341 subjects (247, 73% female) with a median age of 43 years (IQR 37, 51). Prior to the study, none of the patients had undergone viral load testing while on second-line ART. Overall, 127/341 (37%) patients showed a detectable viral load, with median levels of 1101 copies/ml (IQR 218, 16539.5). Among these, 44/341 (13%) patients showed HIV-1 RNA levels below 400 copies/ml, 17/341 (5%) had levels above 400 but below 1000 copies/ml, and 66/341 (19%) showed levels above 1000 copies/ml. Studies are in progress to determine the prevalence of drug resistance in the cohort.

Conclusion: This is the first comprehensive cohort-based analysis of the virological status of patients established on second-line ART in Cameroon. Whilst a subset of patients experienced low-level viraemia, a substantial proportion (1 in 5) met the World Health Organisation (WHO) definition to virological failure, as indicated by a viral load >1000 copies/ml. These data emphasise the need for routine virological monitoring in treated patients in Cameroon. Determining the outcome of second-line ART in patients receiving routine care will improve management by identifying patients that may benefit from intensified adherence support and those that may be candidates for novel treatment combinations.

No conflict of interest

10th International Workshop on HIV Treatment, Pathogenesis, and Prevention Research in Resource Limited Settings

INTEREST

Abstracts

Poster Presentations

Abstract: 27

Antiretroviral Treatment and HIV Care, Comorbidities

Clinical and immunological profile of HIV-infected patients at the initiation of antiretroviral therapy in Douala.

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Background: The late initiation of antiretroviral therapy is common in countries with limited resources, where most patients are not aware of their HIV status until they are symptomatic. Cameroon has made progress in terms of the accessibility of antiretroviral treatments; this includes free access to antiretroviral drugs. The National Treatment Criteria take into account the clinical status of the patient and the rate of T CD4 lymphocytes. With the relative improvement of all these criteria in Cameroon, it is important to evaluate the clinical and immunological profile of patients being placed on antiretroviral treatment.

Material and methods: This was a cross-sectional and analytical study which took place in three hospitals in Douala. Sampling was consecutive. Data were collected on a pre-prepared form using medical records. This included socio-demographic characteristics as well as the clinical and immunological profiles of the patient. Comparison of qualitative data is made through the Chi-squared test, while quantitative data is compared using the Mann Whitney U test. Research of factors associated with the late initiation of treatment was conducted using the logistic regression model. A univariate analysis was conducted and the variables for which the P-value was less than 0.20 were taken into account secondarily for the multivariate analysis.

Results: Overall, 1,661 medical records were included, of which 66.3% were those of women. The median age for those placed under treatment was 41 years for men and 35 years for women ($p<10^{-4}$). Clinical suspicion was the main cause of the discovery of HIV infection, 985 (59.3%) cases. In this study, 391 (23.5%) patients placed under treatment showed an opportunistic infection. Of these, Tuberculosis was the most common infection; 200 (12.1%) cases. Among the patients, 934 (56.2%) were at stages III and IV, 424 (25.2%) at stage I and 309 (18.6%) at stage II of the clinical classification provided by the WHO. The median number of T CD4 lymphocytes was 170 cells/mm3 for men and 180 for women (P = 0.016). According to the univariate analysis, sex, age and diagnostic delay were related to late initiation of treatment with P< 0.05. In the multivariate analysis, it was found that, increasing age by a unit, the risk of beginning treatment at an advanced stage was increased by 1.2%. A short period of initiation of treatment was associated with an advanced stage of the disease. The lengthening of diagnostic time decreased the risk in initiating therapy at an advanced stage.

Conclusion: Clinical condition still remains the main criterion of screening and therefore a requirement for initiating treatment; this explains the greater proportion of patients who were treated at a late stage. Opportunistic infections continue to occur frequently at the onset. Despite the dissemination of the recommendations of the WHO and free treatment, the majority of patients begin their treatment at an advanced stage of the disease. Public authorities should improve the use of early screening.

No conflict of interest

Abstract: 28

Antiretroviral Treatment and HIV Care, Comorbidities

Poor retention on antiretroviral therapy in Cameroon prompts urgent programmatic interventions to limit HIV drug resistance emergence in typical resource-limited settings

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Background: Retention on lifelong antiretroviral therapy (ART) is essential in sustaining treatment success while preventing HIV drug resistance (HIVDR). In an era of rising numbers of patients on ART, mastering patients in care is becoming more strategic for programmatic interventions. Due to lapses and uncertainty with the current WHO sampling approach in Cameroon, we thus aimed to ascertain the national performance of and determinants in retention on ART at 12 months, through an innovative approach.

Materials and Methods: Using a systematic random sampling, a survey was conducted in the 10 regions (56 sites) of Cameroon, within the '*reporting period*' of October 2013-November 2014, enrolling 5005 eligible adults and children. Performance in retention on ART at 12 months was interpreted following the definition of HIVDR early warning indicator: excellent (>85%), fair (85%-75%), poor (<75); and factors with p-value<0.01 were considered statistically significant.

Results: Majority (74.4%) of patients were in urban settings, and 50.9% were managed in reference treatment centres. Nationwide, retention on ART at 12 months was 60.4% (2023/3349); only six sites and one region achieved acceptable performances. Retention performance varied in: reference treatment centres (54.2%) versus management units (66.8%), p<0.0001; male (57.1%) versus women (62.0%), p=0.007; adults (60.3%) versus children (58.8%), p=0.730; WHO clinical stage I (63.3%) versus other stages (55.6%), p=0.007; $CD4_{351-500}$ (65.9%) versus other CD4-staging (59.86%), p=0.077.

Conclusion: Poor retention on ART urges active search for lost-to-follow-up, targeting male, symptomatic patients and eventually medium-age children, while implementing policy to decrease workload in reference treatment centres and urban settings.

No conflict of interest

Abstract: 29

Antiretroviral Treatment and HIV Care, Comorbidities

Survival analysis among patients receiving antiretroviral therapy in the centre region of Cameroon

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Background: With increasing antiretroviral therapy (ART) coverage in Cameroon (from 28,000 patients in 2008 to 122,000 in 2012) following the World health organisation (WHO) criteria of CD4≤350 cells/mm^3, there are increasing risks of poor programmatic outcomes and HIV drug resistance (HIVDR) emergence. We aimed to determine survival rates and associated factors among patients enrolled on ART following the national guidelines in Cameroon.

Materials and Methods: A cohort-study was conducted from January 2012 through June 2013 among patients initiating ART in rural (Mfou District Hospital) and urban (Yaoundé Central Hospital) settings of the Centre region of Cameroon. Socio-demographic, clinical, laboratory and mortality data were analysed with EPI INFO v.3.5.3 and SPSS v.20, using

Cox model and Wilcoxon test for survival analysis.

Results: A total of 350 patients initiating ART (median age 37 years; 71% female) were enrolled, with an overall delayed ART initiation (median CD4: 171 cells/mm^3 and 59.9% at WHO-clinical stages 3 and 4). Survival rates at 6 and 12 months were 93.9% and 91.3% respectively, without significant disparity between the rural and urban setting (p=0.21). Retention in care at 6 and 12 months after ART initiation was 78.6% and 69.1% respectively, suggesting increasing lost to follow-up. Mortality was predominantly associated with initial events of anaemia (p=0.00001), opportunistic infections (p=0.002), CD4 count<200 cells/mm^3 (p=0.004), and slightly with the WHO-clinical stage IV (p=0.057).

Conclusions: Though desirable, there are decreasing rates of survivals within 12 months of ART initiation, while retention in care drops below minimal target of 70%. Thus, an improved life expectancy on ART requires close monitoring for anaemia, preventing clinical events, tracing defaulters to limit HIVDR emergence, while ensuring earlier initiation on ART (i.e. at higher-CD4 counts) in both rural and urban resource-limited settings.

No conflict of interest

Abstract: 30

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Early mortality during initial treatment of tuberculosis in patients co-infected with HIV at the Yaoundé Central Hospital, Cameroon

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Background: Understanding contributors to mortality during the initial phase of tuberculosis (TB) treatment in patients co-infected with HIV would guide targeted interventions to improve survival. The aim of this study was to ascertain the incidence of death during the initial 2 months (new cases) and 3 months (retreatment cases) of TB treatment and to assess correlates of mortality in HIV co-infected patients.

Materials and Methods
We conducted a hospital-based retrospective cohort study from January 2006 to December 2013 at Yaoundé Central Hospital, Cameroon. We reviewed medical records to identify co-infected TB/HIV inpatients aged 15 years and older who died during TB treatment. Death was defined as any death occurring during TB treatment, as per World Health Organization recommendations. We collected socio-demographic, clinical and laboratory data. We conducted multivariable logistic binary regression analysis to identify factors associated with death during the intensive phase of TB treatment. Magnitudes of associations were expressed by adjusted odds ratio (aOR) with 95% confidence interval. A p value < 0.05 was considered statistically significant.

Results: The 99 patients enrolled had a mean age of 39.5 (standard deviation 10.9) years and 53% were male. Patients were followed for 276.3 person-months of observation (PMO). Forty nine patients were died during intensive phase of TB treatment. Death incidence during the intensive phase of TB treatment was 32.2 per 100 PMO. Having a non-AIDS comorbidity (aOR 2.47, 95%CI 1.22-5.02, p = 0.012), having extra-pulmonary TB (aOR 1.89, 95%CI 1.05-3.43, p = 0.035), and one year increase in duration of known HIV infection (aOR 1.23, 95%CI 1.004-1.49) were independently associated with death during the intensive phase of TB treatment. Sex, age, level of education, marital status, area of residence, year of TB diagnosis, body weight, presence of another AIDS defining illness, cotrimoxazole prophylactic therapy, antiretroviral therapy, white blood cells count, CD4 lymphocytes count, and hemoglobin level were not associated with early death (p > 0.05)

Conclusions: Mortality incidence during intensive phase of TB treatment was high among TB/HIV co-infected patients during TB treatment; and strongly associated with extra pulmonary TB suggesting advanced stage of immunosuppression and non-AIDS comorbidities. Early HIV diagnosis and care and good management of non-comorbidities can reduce this incidence.

No conflict of interest

Abstract: 31

Antiretroviral Treatment and HIV Care, Comorbidities

Frequency and factors associated with excess weight among HIV infected individuals in Mansa district, Zambia

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Background: There is a paucity of studies on nutritional status of HIV infected individuals in Zambia. The aim of this study was to determine the frequency and factors associated with excess weight among HIV-infected individuals at an urban health center in Mansa District, Zambia.

Methods: This was a cross-sectional study carried out at Central Clinic, a health center located in Mansa District. We selected a random sample of HIV-infected individuals aged 17 years and above, regardless of whether or not they were on antiretroviral therapy (ART) as of May 2014. We used a structured questionnaire to collect data on socio-demographic characteristics and physical measurements including weight and height for calculating body mass index (BMI) for the participants. Excess weight was defined as BMI ≥ 25.0 Kg/m^2. We used a multivariable logistic regression model with backward elimination to obtain the adjusted odds ratios (aOR) and 95% confidence intervals (CI) of factors associated with excess weight.

Results: Of the 341 HIV-infected individuals included in the sample, 213 (62.5%) were female. The median age of the participants was 35.0 years (IQR: 18-60). 207 (60.7%) were taking ART. Alcohol consumption and smoking tobacco were more common in males than females (16.3% vs. 5.9%, and 10.6% vs. 1.5%, respectively). The frequency of excess weight was 49 (14.4%). Males were 74% less likely to have excess weight compared to females (aOR=0.26; 95% CI [0.11, 0.59]). Participants drinking alcohol were three times more likely to have excess weight compared to non-drinkers (aOR=3.37; 95% CI [1.29, 8.75]). Married participants were thrice more likely to have excess weight compared to the divorced ones (OR=3.09; 95% CI [1.02, 9.36]).

Conclusion. In this study, males only had a 26% chance of having excess weight compared to females, possibly due to the protective effect of smoking against obesity. Alcohol drinkers were more likely to have excess weight compared to non-drinkers possibly due to the high caloric content in alcohol. Interventions to encourage HIV positive individuals to limit alcohol consumption and adopt healthier lifestyles should be implemented to curtail the frequency of excess weight.

No conflict of interest

Abstract: 32

Antiretroviral Treatment and HIV Care, Comorbidities

Mortality among HIV-infected patients on ART at a Referral hospital, Western Kenya, 2011-2014

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Background: Older HIV infected patients have been shown to have faster disease progression, a poorer immunological response to Anti-Retroviral Therapy (ART) and a higher risk of mortality compared to younger patients.

Methods: Medical records of HIV-infected non-pregnant female and male patients aged ≥15 years enrolled between May 2011 and March2013 at Jaramogi Oginga Odinga Teaching and Referral Hospital in Western Kenya, were reviewed to examine the effect of age on patient mortality among HIV-infected patients initiated on ART based on the WHO 2010 ART guidelines. Patient were categorized into age-groups based on their age at enrollment; I (15-29 years) II (30-39 years), III (40-49 years) and IV (50+ years).
All patients were followed up to March 2015. Among ART eligible patients who were started on ART, Cox proportional hazards (Cox-PH) model, adjusted for marital status, gender, education level, CD4 category at enrolment and time to ART initiation were used to compare the hazard of dying in each age group.

Results: Of 453 HIV-infected patients enrolled, 153 (34%) were in age group I, 176 (39%) in II, 74 (16%) in III and 50 (11%) in IV. All patients were followed up for a cumulative period of 129.3 years; this was 42.9 years, 52.2 years, 20.3 years and 13.9 years for patients in age-groups I, II, III and IV respectively.
At the end of the follow up period, among patients with known outcomes, 34 (8.5%) had died; there were7 (5.5%) in age groups I, 12 (7.5%) in II, 9 (12.9%) in III and 6 (13.3%) in IV. When compared to patients in age-group I, the adjusted hazard ratio of death among patients in age-groups II, III and IV was 1.35 (95% CI 0.81-2.31; p=0.2459), 1.55 (95% CI 1.08-2.24; p=0.0190) and 1.36 (95% CI 1.00-1.84; p=0.0.0456) respectively. Of the covariates adjusted for in the model, none was statistically significant.

Conclusion: Although higher death rates among older patients could be attributed to poor immunological responses other comorbidities could also explain this. Further investigation into causes of death and the presence of comorbid conditions is recommended.

No conflict of interest

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Patient Therapeutic Education integrated in clinical trial : the experience of 2LADY and MOBIDIP ANRS clinical trials

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Introduction: Biomedical research is becoming more frequent in resources-limited countries. Clinical trials to evaluate therapeutic strategies are developed: these strategies need full adherence of participants to treatment and comprehension of their disease to ensure successful evaluation of results. A service of therapeutic education provides the support and the tools to accompany patients through the learning process. We describe our experience in the transition from adherence support to therapeutic education service.

Methods: When the trial ANRS 12169/2LADY started, a program to support adherence to treatment for patients failing first line antiretroviral treatment (ART) and starting second line drugs was implemented. A standardised questionnaire was used to identify problems in relation to non-adherence and to evaluate strengths and weakness of the planned solutions. A systematic and individualised support was proposed with reporting of follow up on pharmacy forms. Visits were managed by nurses or social assistants trained in patients education (FormatSanté) with the objective to overcome difficulties hindering optimal adherence. Some tools (pill boxes, leaflet, reminders) were available to facilitate support.

Results: The experience over the 4 years of the 2LADY clinical trial stimulated the team to formalise and better develop the service of support with a real patient education approach (adult learning) for the following trial (ANRS

12286 MOBIDIP). A directory of needed competences to manage HIV infection and treatment has been compiled with specific learning objectives. Patients were trained to propose solutions, that could be applied with the support of the educator especially for what concerns set up of therapeutic routine, drugs management, involvement of significant others, referral to psychological support. This approach fostered the learning process of participants thanks to the friendly environment and active listening. Number of encounters was not pre-specified but worked out individually depending on the patient and provider availability. For patients with viral rebound, visits to the education service were mandatory. Educational sessions coincide most of the time with protocol planned visits but could be organised beyond that in case of needed support for special care or treatments, on convenience appointments. Sessions rarely last more than 30 minutes, but the limited health staff dedicated to this service could cause long waiting time for participants. Patients voluntarily attended the sessions, adhered to the support measures and paid their transport when extra-protocol visits were planned. When problems were identified, discussions with the care team took place to foster interdisciplinary management.

Conclusion: The therapeutic education programme should be planned before initiation of a clinical trial and integrated as research related activity. Means should be available and trained staff dedicated to this task. The education of patients resulting in their better management of health is one of the added values of clinical research.

No conflict of interest

Abstract: 34

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Factors associated with delay in presentation of symptomatic cancers among HIV infected persons in Plateau state, Nigeria.

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Background: There is increased incidence of cancer worldwide but much of the burden of morbidity and mortality will occur in the developing world because of cancer associated infectious diseases of which HIV infection carries a large proportion. The high morbidity and mortality attributed to cancer in Nigeria is as a result of late presentation. Site based studies show that proportion of late stage cancer presentation range between 60-92% in the last 10years. There is paucity of information on reasons for the late presentation . This study sort to find out the factors associated with delay in presentation of symptomatic cancers among HIV infected persons in plateau state , Nigeria.

Methods: A mixed method study consisting of quantitative and qualitative component. Participants were sampled from HIV infected persons diagnosed with cancer and referred to the Oncology unit. Variables on Patient and health service factors associated with late presentation of cancers was collected. Quantitative data was analyzed using Epi-info version 3.5.3 and Microsoft Excel while thematic analysis was done for qualitative data.

Results: There were 503 respondents, the mean age was 48.7±13.5years. Male sex OR 2.5, (P=0.002); Farming occupation OR 1.7, (P=0.0005) and Primary education OR 2.0, (P=0.0005) were associated with delay. Majority of respondents 349(69%) presented more than six months after onset of symptom. Common symptoms were pain 462(45.70%), swelling 237(23.44%) and skin discoloration 210(20.77). Their Initial reaction was mainly the use of Alternative remedies 234(46.5) CI 42.1-51.0. Up to 274(54.47%) of participants obtained diagnosis 3months after presenting to a health facility. Laboratory related issues 199(39.56%) and long booking time 163(32.40%) were the most common reasons for delay.

Conclusion: Delay was found to be both patient and services related. Participants sought alternative remedies before presentation,

compounded by delay in diagnosis and initiation of treatment at health service facilities. Increased cancer awareness, routine cancer screening and improved health services may reduce delay.

Conflict of interest: Study was supported with $1000 by Center for Disease Control(CDC)through Nigeria Field Epidemiology and Laboratory Training program(N FELTIP).

Abstract: 35

Antiretroviral Treatment and HIV Care, Comorbidities

Predictive factors of unsuccessful treatment outcomes among HIV-infected Buruli ulcer patients: a retrospective cohort study, Akonolinga, Cameroon

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Introduction: Although awareness of the relevance of Buruli ulcer (BU) and HIV coinfection is increasing in sub-Saharan Africa, predictive factors of its treatment outcomes are not well described. The objective was to determine the predictive factors of mortality and lost to follow-up (LTFU) during BU treatment in patients co-infected with HIV.

Materiels and Methods: A retrospective cohort study has been conducted by reviewing the hospital database and medical records of BU/HIV patients admitted between January 2008 and March 2015 in the Akonolinga District Hospital in Cameroon. We included 98 patients with reported outcomes. LTFU was defined as any patient who lost contact with services for more than 3 months. Multivariate Cox regression analyses were used to identify predictive factors with adjusted Hazard ratio (HRa) and a 95% confidence interval.

Results: The mean age in our population was 38.1 ± 15.7 years, and 36.7% (n=36) were male. The median follow-up period was 5.4 (interquartile range 3.1-10.5) person-months of observation (PMO). Nine patients died and nine were LTFU. The rates of mortality and LTFU were similar: 1.2 per 100 PMO. Predictive factors of mortality were the use of traditional medicine (aHR: 7.0 [1.3-38.8]; p = 0.026), recent HIV diagnosis (aHR: 0 57 [0.38-0.85]; p = 0.005), presence of an opportunistic infection (aHR 7.7 [1.6-37.2]; p = 0.011) and not being on antiretroviral treatment (ART) (aHR: 23.3 [3.4-59.4]; p = 0.001). For LTFU, only the use of traditional medicine was significantly associated (aHR 5.9 [1.2 to 29.0]; p = 0.030).

Conclusion: Access to specific health services should be facilitated to reduce delay in offering appropriate BU and HIV treatments, and the mortality and LTFU among HIV-infected BU patients. Therefore, traditional practitioners should be trained and integrated into BU care services to foster patient referral.

No conflict of interest

Abstract: 36

Operational research/implementation science

Can rural communities access quality HIV prevention, care and treatment services? Lessons from the AIDS Healthcare Foundation model in Gbajimba, Benue State

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Introduction: Numerous factors impede the implementation of health programmes in rural communities in Nigeria .AIDS Healthcare foundation (AHF) currently implements a comprehensive HIV/AIDS treatment, care and prevention program in Gbajimba, a rural

community in Benue state, located about 40kms from the state capital, with an HIV prevalence of about 6%. This paper aims to share AHF's experience in the implementation of a rural based HIV/AIDS program.

Methods: Our approach involves close collaboration with the council wards leadership, all of whom accepted to work with AIDS Healthcare Foundation, the only non-governmental organization present in the local government area. Several Advocacy visits on HIV/AIDS to the key community leaders ensured that they identified with the need to promote greater community involvement and ownership of the program.
Our HIV testing model utilized the facility and outreach activities to reach clients with strong focus on pregnant women and pediatric clients. Outreach activities are conducted in 10 council wards from market square, community halls and football fields.
All positive cases are referred to the facility for enrollment and baseline assessment while eligible clients were commenced on appropriate antiretroviral therapy.

Result: The AHF program has successfully carried out HIV counseling and testing in all the council wards. Most of these council wards had no prior access to HIV testing .Community mobilization has resulted in massive community support, with resources provided by community members for many activities. To date, 114444 community members have been tested in the facility and HCT outreaches, of which 5617(5.0%) tested positive, 4150 (3.6%) clients was enrolled and 3510 (3.1%) commenced on antiretroviral drugs.

Conclusion: We conclude that inequitable access to HIV prevention and treatment in rural settings makes it imperative to prioritize them in implementation and scale up plans. More research into successful Models of care in rural settings will be needed.

No conflict of interest

Abstract: 37

Operational research/implementation science

Virological Response, HIV-1 Drug Resistance Mutations and Genetic Diversity among Patients on First-Line Antiretroviral Therapy in N'Djamena, Chad

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Background: The national antiretroviral therapy (ART) in the Republic of Chad provides free of charge ART regimens and therapeutic monitoring for patients receiving ART nationwide. For a successful programmatic uptake, these efforts merit to be supported by thorough assessments of ART response and HIV-1 drug resistance (HIVDR) surveillance. We therefore evaluated the virological response to ART, HIVDR emergence and circulating HIV-1 clades in a Chad context.

Materials and Methods: A cross-sectional and prospective study was conducted among 116 patients (41 [δ±6,87] years, 58.6% female) receiving first-line ART for ³6 months in Ndjamena, Chad, from 2011-2012. Plasma viral load (PVL) was concomitantly measured using *Abbott Real-Time* and *Cobas AmpliPrep / TaqMan*, and virological failure (VF) defined as ³1000 HIV-1 RNA copies/ml. Plasma from patients experiencing VF were processed for sequencing of HIV-1 protease-reverse transcriptase using the *ANRS-AC.11* resistance testing protocol; drug resistant mutations (DRMs) were interpreted using the *ANRS-AC11*

algorithm; and phylogenetic analysis was performed using *MEGA.v.6*.

Results: Majority of patients was receiving AZT+3TC+NVP (45.7%), d4T+3TC+NVP (41.4%) and TDF+FTC+EFV (11.2%), for a median time-on-treatment of 5 [IQR: 4-7] years. The rate of VF was 43.1% (50/116), with 86% (43/50) sequencing performance. Overall, 31.9% (37/116) presented ≥one major DRM, among which 29.3% (34/116) to nucleos(t)ide reverse transcriptase inhibitors (25% M184V/I, 11.2% T215Y/F, 3.4% K70P/R/W, 3.4% K219E/N/Q, 1.7% A62V, 1.7% V75I/L); 31.9% (37/116) to non-nulceos(t)ide reverse transcriptase inhibitors (11.2% K103N/S/E, 9.5% Y181C/V/F/L, 0.9% L100I, 0.9% F227L, 0.9% P225H); and 0.9% (1/116) to protease inhibitors (M46I, I54V, V82S). Five pure subtypes (30.2%J, 16.3%G, 9.3%A 9.3%D, 4.65%F) and only one circulating recombinant form (30.2% CRF02_AG) were found.

Conclusions: In Chad, almost half of patients are failing first-line ART after five years, with considerable DRMs at failure. Absence of K65R supports TDF-containing regimens as preferred first-line and as suitable drug for second-line combinations. The growing CRF02_AG should be monitored for the subsequent spreading, as well as for potential clinical and public health implications.

No conflict of interest

Abstract: 38

Operational research/implementation science

Comparable Outcomes in Pretreatment HIV-1 Drug Resistance between Urban and Rural Settings in the Littoral Region of Cameroon

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Background: In an era of increasing access to antiretroviral therapy (ART), a major programmatic challenge in resource-limited settings (RLS) is emerging HIV-1 drug resistance (HIVDR) and its transmission within the community. Of note, in spite of the high potency of first-line ART regimens commonly available in RLS; most of these drugs have low-genetic barriers to resistance, in the frame of suboptimal adherence and frequent drug stock outs. HIVDR therefore becomes more concerning, requiring national strategies for evidence-based policy-making. Our first assessment conducted in the Centre region of Cameroon showed moderate-level HIVDR (7.6%) among ART initiators, suggesting wider investigations for effective public-health actions nationwide. The Littoral being the second national region with extensive ART-exposure, we sought to determine the threshold of HIVDR among ART initiators in the Littoral region of Cameroon and adequacy with current first-line ART in both urban and rural settings.

Methods and Materials: A cross-sectional and prospective study conducted from January-May 2015 among patients initiating ART in urban (*Laquintinie and Bonassama* health facilities) and in rural (*Mbanga and Njombe* health facilities) of the Littoral region of Cameroon. Protease/reverse-transcriptase HIVDR testing was performed using Sanger-based genotyping assay at the Chantal BIYA International Reference Centre for research on HIV/AIDS prevention and management, Yaoundé, Cameroon. HIVDR mutations were interpreted using Stanford *HIVdb*, and subtyping was performed by phylogeny, REGA, COMET and SCUEAL. Data were compared between urban and rural settings, subtype distribution and CD4 staging by Fisher Exact test, with p-value<0.05 considered statistically significant.

Results: In total, 62 eligible patients were enrolled: median [interquartile range] age of 34 [25-45] years; 258 [150-373] CD4 cells/mm^3; 66.2% and 17.7% at the World Health Organisation clinical stages II and III

respectively; and 75.8% were female. Five were exposed to antiretroviral prophylaxis and 16 samples were unsuccessfully processed. Of the 41 complete protease/reverse-transcripatse sequences generated (22 urban vs. 19 rural settings), HIV-1 subtyping revealed 73.2% CRF02_AG, 19.5% CRF22_A1A1, 4.9% CRF11.cpx and 2.4% subtype D, thus suggesting higher rates of recombinants circulating in the Littoral region. A moderate-level HIVDR was found 9.76% (4/41), with predominately K103N (3/41), V90I (2/41), L210W (1/41), K219EK (1/41), and P225H (1/41). These patterns suggest transmitted HIVDR mostly affect non-nucleoside reverse transcriptase inhibitors (NNRTIs). Prevalence was similarly distributed according to geographical settings (9.1% [2/22] urban vs. 10.5% [2/19] rural settings, p=1.000); according to local HIV-1 major subtypes (6.7% [2/30] CRF02_AG vs. 18.2% [2/11] non-CRF02_AG, p=0.288); and according to CD4 staging (11.5% [3/26] for <200 cells/mm^3 vs. 6.7% [1/15] higher CD4≥200 cells/mm^3, p=1.000).

Conclusions: Similar to the Centre region of Cameroon, the moderate-level HIVDR in the Littoral region suggests intensifying virological monitoring in national settings with long-term ART experience. HIVDR mutations mostly hampered NNRTIs locally used in first-line ART (nevirapine and efavirenz), followed by thymidine analogs, suggesting regular counseling support towards optimal adherence on these regimens. In a context of growing viral recombinants, these public health strategies constitute the footprint in sustaining the effectiveness of ART in resource-limited countries with similar programmatic perspectives.

No conflict of interest

Abstract: 39

Operational research/implementation science

ART delivery for 90-90-90 in Nigeria – the impact of different service models in increasing access

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Background: In 2015, the UNAIDS set forth a set of ambitious treatment targets that are aimed at pushing towards the end of the HIV epidemic by 2030. PEPFAR also released a set of five key agenda as part of its PEPFAR 3.0 approach. A major gap for many countries remained understanding what delivery models will work to help reach these targets. We set out to evaluate the feasibility of three different approaches and derivable impact.

Method: The study was a community-based, three-arm cluster non-randomized trial of ART delivery approaches for epidemic control in four states of Nigeria. Each arm had a distinct ART delivery model that includes community and facility level activities. Facility optimization was commenced 2 months before introducing community services. Our primary outcome measure was the trend in number of persons receiving ART between Jan 2015 to Jan 2016. We projected possible outcome for 2 scenarios – if ART delivery continued at usual pace (scenario 1), if only facility optimization was introduced (scenario 2) and compared these to the actual data from implementation – facility optimization and community ART (scenario 3). The key variable was the service delivery model for each cluster.
Service delivery models. Model A: optimizing HTC within health facilities, general health screening and HTC in targeted community locations with door-to-door testing, full range of comprehensive HIV services including antiretroviral treatment (ART) provided by multidisciplinary teams within the community. Model B: optimizing HTC within health facilities, general health screening and HTC in targeted community locations, counseling and linkage to specified hub treatment sites for continued care. Model C: optimizing HTC within health facilities, HTC in smaller primary level health centres that are not treatment sites. Pooling of clients for visiting treatment teams.

Results: In model A, scenario 1, 4,483 persons would have started ART by Jan 2016. A 69% increase would have occurred if facility optimization alone was introduced into the

service delivery model (scenario 2). In reality (scenario 3), the model delivered a 240% increase for persons on ART within 8 months of implementation. In model B, scenario 1 would have yielded 4,029 new ART starts, with scenario 2 leading to a 3% increase and scenario 3 actually yielded 85% increase. For model C, scenario 1 would have led to 3,759 new ART starts, scenario 2 would have led to 11% increase while scenario 3 led to 18% increase. For all models, the observed trend was statistically significant ($p<0.001$). For all models, we observed a lead time between introduction of strategies to optimize facility efficiencies and an upward trend in new ART starts.

Conclusion: Though all models led to significant increases in yield, model A led to the highest increase. The observed differences can be attributed to differences in the components of the models and the settings for implementation. We conclude that a well-defined mix of community and facility level approaches are needed for ART delivery in the march towards 90-90-90.

Conflict of interest: The project under which this work was carried out is funded by PEPFAR through a USAID cooperative agreement

Abstract: 40

Operational research/implementation science

What is the role of community delivery compared to facilities in expanding access to ART services?

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Introduction: As low income countries continue to increase efforts to close the gaps in access to antiretroviral treatment, there has been emphasis on decentralization of care from higher levels of care to primary healthcare facilities. However, access to ART continues to be limited. This has led to considerations of alternative models for delivering antiretroviral treatment. In June 2015, in collaboration with local Nigerian authorities at state, local government and community levels, we piloted two models of community based ART delivery. This paper compares community models with facility-based ART delivery

Methods: Retrospective analysis comparing the outcomes of community-based and facility-based ART delivery approaches in 14 HIV high burdened LGAs across 4 PEPFAR priority Nigerian states. Two community based models with pre-defined package of interventions were introduced in the LGAs which already had established facility ART delivery.
Model specific packages were: Model A: (i) Expanding outlets for HIV testing and counselling in addition to provider initiated testing and counselling for health facilities within the LGA (ii) Community wide HIV testing and counselling with a mix of targeted outreach to specific community locations, door-to-door household testing (iii) Provision of full range of comprehensive HIV services including clinical and laboratory evaluation and antiretroviral treatment (ART) provided by multidisciplinary community mobile teams.
Model B: (i) Expanding outlets for HIV testing and counselling in addition to provider initiated testing and counselling for health facilities within the LGA (ii) Community wide HIV testing and counselling with a mix of targeted outreach to specific community locations, door-to-door household testing, (iii) Care enrolment for positives within the community (iv) Counseling, referral linkage of ART eligible patients to specified hub treatment sites for ART initiation and continued care.
Primary outcome measure was the number of persons newly initiated on ART between October 2014 and January 2016, a 16 months period, half-way into which the community models were introduced.
A paired t-test was run to determine whether there was a statistically significant mean difference between the community and facility based ART initiation. STATA software version 12 was used to analyze

Results: In the period after community-based ART delivery commencement, Model A implemented LGAs had a cumulatively higher mean ART initiation in communities (102 ± 81.6) as opposed to the mean ART initiations recorded in health facilities (79.1 ± 43.8); , p =0.043. In contrast, Model B implemented LGAs had cumulatively higher mean ART initiation in facilities (42.7 ± 4.4) as opposed to the mean ART initiations recorded in the communities (9.7 ± 2.1); (p<0.0001)
Both Model A and Model B implementing LGAs had increased cumulative facility ART initiation (after the introduction of community models into the LGAs (3,437 vs 5979, Model A) (796 vs 1295, Model B)

Conclusions: Results indicate that the addition of community based models of ART delivery was associated with an increase on LGA wide ART delivery, both through facility and community deliveries. More importantly, the findings indicate that barriers preventing access to antiretroviral therapy can be overcome if additional interventions are implemented.

No conflict of interest

Abstract: 41

Pediatrics

Improving dried blood spot transport logistics for early infant diagnosis (EID) of HIV in Nigeria: the SPEEID model

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Introduction: WHO recommends that all children exposed to HIV be tested within four to six weeks of birth to ensure that all infected infants are initiated on treatment early. One major challenge with EID of HIV in Nigeria remains the absence of standardized logistic sample transfer systems, resulting in long turnaround times between date of sample collection and date of return of result to the mother-baby pair. The USAID-funded ProACT project implemented by MSH pioneered a unique dried blood spot (DBS) transport model in Nigeria. This model focuses on the transportation of dried blood spot (DBS) samples to regional PCR labs in partnership with the Nigerian Postal Service (NIPOST) utilizing its courier Express Mail Service (EMS). The NIPOST mail route has a network of over 900 post offices and 3,000 postal agencies spread across the country, ensuring coverage of most localities where HIV services are delivered. The objective of this study was to review the effect of utilizing an innovative DBS transport model in improving DBS transportation.

Materials and Methods: We carried out a retrospective analysis of logistic data from 177 samples transferred from 28 PMTC sites using the SPEEiD model over a 12 month period from March 2013 to February 2014 in Kwara state, North Central Nigeria

Results: A review of the data showed a reduction in Turnaround Time (TAT) for return of results from 3-6 months to 3-4 weeks utilizing the SPEEiD Model. Results were received for 97% of samples (171/177) transported with this model, compared to 51% previously. The average cost of sample transfer was estimated at between $20-$40 per batch and remains comparatively less expensive to other models by at least 30%.

Conclusions: The MSH SPEEiD model remains an indigenous, cost effective, sustainable, and time sensitive sample transfer model which ensures that exposed infants are able to receive their EID test results quickly. This approach may be easily replicated by other partners within Nigeria and other similar resource limited setting with existing mail infrastructures. This model thus helps to provide a practical solution to DBS sample transfer, which remains one of the major challenges affecting early infant diagnosis of HIV in Nigeria.

No conflict of interest

Abstract: 42

Pediatrics

Long-term antiretroviral treatment adherence in perinatally HIV infected adolescents in Uganda: A qualitative study

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Background: Despite global decline in HIV related mortality, the numbers of deaths have disproportionally increased among adolescents living with HIV/AIDS (ALWHA) especially in sub-Saharan Africa. We sought to assess the challenges to long-term adherence to antiretroviral treatment (ART) in perinatally infected adolescents in Uganda.

Methods: We conducted 24 in-depth interviews and 2 focus group discussions with a total of 33 health-care providers and expert clients in three regional facilities in Uganda between May-August 2015. Interview topics included experiences with patients on long-term treatment with either declining or persistent poor adherence. Transcribed texts were coded and analyzed based on the social-ecological framework.

Results: Decline in adherence during transition to adolescence was mainly due to late and poor disclosure by caretakers and minimal disclosure support from health providers. Barriers to ART adherence during adolescence included decline in peer-to-peer group support, challenges with disclosure in intimate relationships and stigma which mainly impacted adolescents in boarding schools. Treatment side effects resulting with visible body changes such as dyslipidemias from Lopinavir and 'yellow eyes' from Atazanavir were also associated with increased stigma. Transitioning into adult-based care among young adults was also linked to a decline in adherence citing diminishing clinical support, difficulties in integrating with adult patients, long waiting time and lack of medicine for non-HIV ailments.

Conclusion: Support for early and progressive disclosure for caretakers, support for progressive transition to adult-based care and interventions to reduce stigma in boarding schools are needed to enhance long-term adherence in perinatally infected ALWHA in Uganda.

No conflict of interest

Abstract: 43

Pediatrics

HIV-Infected or Exposed-Children Exhibit Lower Responses to Hepatitis B Vaccine in Yaoundé, Cameroon: Appealing for Revised Policies in Resource-Limited Settings?

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Background: Since 2005, anti-hepatitis B virus (anti-HBV) vaccine is part of the Expanded Program on Immunization (EPI) for infants born

in Cameroon, with 99% anti-HBV coverage estimates. To ensure effective immunization, we sought to ascertain paediatric anti-HBV vaccine response and compare response according to HIV status.

Materials and Methods: A study was conducted among 82 children (27 [IQR: 9-47] months, min-max: 6-59), following complete anti-HBV vaccination at the *Essos* Health Centre in Yaounde, Cameroon. Children were classified as group-A: HIV unexposed (28), group-B: HIV-exposed/uninfected (29), and group-C: HIV-infected (25). Quantitative anti-HBs ELISA was interpreted as no, low or protective response with <1, 1-10, or ≥10 IU/L respectively. P-value<0.05 considered significant in the dataset.

Results: Children were all HBV-unexposed (AcHBc-negative) and uninfected (HBsAg-negative). Reactivity to anti-HBV vaccine was 80.49% (66/82) and only 45.12% (37/82) developed a protective response (≥10IU/L). According to HIV status, protective response was found in 60.71% (17/28) from group-A, against 51.72% (15/29) and 20% (5/25) from group-B and group-C respectively, p=0.041. According to feeding option during first six months of life, protective response was found in 47.67% (21/45) on exclusive breastfeeding against 43.24% on mixed or formula feeding, p=0.757. According to age, protective anti-HBV response decreased significantly between 6 months (67.65%, 23/34) and 33-41 months (0%, 0/5), p=0.012. Most importantly, early age (<24 months) was significantly associated with higher rate of vaccine efficacy (58.33%, 28/48), about two-fold, compared to older children (26.47%, 9/34), p=0.007.

Conclusions: Anti-HBV vaccine provides low immunization in children in general, particularly if HIV-vertical exposed and worst if HIV-infected and/or with older in age. Implementing early age vaccination strategies, developing specific immunization policy for HIV-exposed/infected children, and monitoring vaccine response, as children grow older, would ensure lifelong protection within tropical paediatrics.

No conflict of interest

Abstract: 44

Prevention of Mother to Child Transmission

Using Leveraged platform to address PMTCT Knowledge and Skill gaps among Rural Health Care Workers in South-East Nigeria

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Background: The quality of Prevention of Mother To Child Transmission of HIV (PMTCT) services provided to the clients depends on several factors including the skill of the Health Care Workers (HCWs). Pre-activation evaluation of a PMTCT project in 209 rural Health Facilities (HFs) in South-East Nigeria revealed huge knowledge and skill gaps in PMTCT service delivery among the rural HCWs. Fund reduction in the 2014 project budget cycle restricted the ability of the project to adequately train these rural health workers; necessitating the need for instituting innovative approaches at bridging the knowledge and skill gaps. One of the innovative approaches was to integrate PMTCT capacity building into the monthly community PMTCT outreach review meetings conducted by the project for the facility staff.

Materials & Methods: Thirty (30) PMTCT focal persons, comprising mainly of Community Health Extension Workers (CHEWS), who currently providing PMTCT services in their respective HFs and were observed to lack appropriate knowledge/skill for PMTCT service delivery, were purposively invited for monthly community PMTCT outreach review meeting. The meeting platform was leveraged to build the capacity of these rural HCWs on PMTCT service delivery; using adult learning principles to facilitate learning. The capacity building exercise was design to adequately explore

Group discussions with simulation of scenarios related to HIV Counseling and Testing (HCT); specific PMTCT intervention, including provision of Anti-Retrovirals (ARVs); PMTCT data capturing tools; and Dry Blood Spot (DBS) for Early Infant Diagnosis (EID). Materials used included PMTCT National guideline, Nigerian National EID training manual, DBS kits, DBS collection, storage and transportation job aids, Pre- and Post-training tests for assessment, and end of training evaluation tool. The Pre- and Post-training tests as well as the end of training evaluation tool results were analyzed using Microsoft Excel and Statistical Package for the Social Sciences (SPSS) software.

Results: The highest pre- and post-test scores were found to be 42.5% and 70% respectively; representing 27.5% increase in knowledge after the intervention. 84% had a better understanding of PMTCT service provision against 30% before the training; 92% shows better understanding of PMTCT registers when compared to 52% before the training and 76% demonstrated confidence on DBS sample collection as against 22% before the training. Similarly, 23 participants were able to collect DBS sample after the training relative to only 4 participants prior to the intervention. Finally, 92% of the participants were both 'empowered and willing' to pass knowledge and skills to their colleagues at work.

Conclusions: The results show that targeted facility-based training using adult learning approach and simulation of clinical scenarios; aimed at bridging knowledge and skill gaps among healthcare providers could be efficiently built into routinely funded program activities especially in the context of limited resources and reducing donor support, while achieving positive impacts on the overall program performances.

No conflict of interest

Abstract: 45

Prevention of Mother to Child Transmission

Optimizing PMTCT Service Uptake Through Community Involvement in Enugu State, Nigeria

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Background: Nigeria ranked high among countries with the highest global Mother To Child Transmission (MTCT) burden. Despite this fact, only 8% of identified HIV positive pregnant women were offered Anti-retroviral (ARV) prophylaxis due to missed opportunities and inadequate access to services. The poor access to Prevention of Mother To Child Transmission (PMTCT) services greatly affect the population living in the rural areas due to high stigma levels, illiteracy and abject poverty.

Materials & Methods: Community leaders in targeted communities of South-East Nigeria were partnered with to identify mobile HIV Testing and Counseling team who were equipped to mobilize pregnant women to access PMTCT services in health facilities within their communities, provide HIV Counseling and Testing (HCT) services to pregnant women within the community as well as provide escort services to identified HIV positive pregnant women to the rural HIV clinics in January 2014. The rural HIV Testing and Counseling team were also supported to track and return back to care HIV positive pregnant women previously identified, but not on ARV Prophylaxis. Excel and Statistical Package for the Social Sciences SPSS packages were used to compare quarterly PMTCT services uptake at the community health facilities between Oct-Dec., 2013 (Pre-intervention) and subsequent quarters in 2014 (Post-intervention).

Results: The number of pregnant women who came for first time antenatal visit were 2,426 (pre-intervention period: Oct-Dec, 2013); 3,573 (Jan-Mar, 2014); 3,269 (Apr-Jun, 2014); 7,981 (Jul-Sep, 2014); and 7,111 (Oct-Dec, 2014) respectively. Thus, 2,426 (pre-intervention period) accounted for only 9.96% of the total 24,360 new ANC clients who visited the rural

facilities during the review period. The number of pregnant women who were counseled, tested for HIV and received results were 2,785 (Oct-Dec, 2013); 6,627 (Jan-Mar, 2014); 8,905 (Apr-Jun, 2014); 23,889 (Jul-Sep, 2014); and 7,455 (Oct-Dec, 2014) respectively. Similarly, more HIV positive pregnant women (37- Oct-Dec, 2013; 58- Jan-Mar, 2014, 56- Apr-Jun, 2014, 87- Jul-Sep, 2014, 104- Oct-Dec, 2014) were identified and placed on ARV prophylaxis in the post intervention period. There were increased hospital deliveries (466- Oct-Dec, 2013; 808- Jan-Mar, 2014, 868- Apr-Jun, 2014, 796- Jul-Sep, 2014, 699- Oct-Dec, 2014) in rural communities during the post intervention period.

Conclusions: Strategically engaging community in the implementation of the HIV program resulted in the observed increase in the number of women accessing Ante Natal Clinic (ANC)/PMTCT services at the community health facilities.

No conflict of interest

Abstract: 46

Prevention of Mother to Child Transmission

Scaling up Early Infant Diagnosis (EID) Services in Nigeria through EID Mentor Approach

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Background: Ninety five percent (95%) of pediatric HIV infection in Nigeria occurs during pregnancy, child birth, or through breast feeding. One of the challenges with scaling up pediatric HIV treatment in Nigeria is the inability to make pediatric diagnosis early due to poor health workers skills on pediatric diagnosis, lack of access to the modern diagnostic technologies including polymerase Chain Reaction (PCR) assays and delays in returning results of Early Infant Diagnosis (EID) form reference labs. Majority of the PMTCT sites in Nigeria are located in the rural areas. A review of the rural Standalone Prevention of Mother To Child Transmision of HIV (saPMTCT) sites at 209 health facilities in South East Nigeria showed that none of the staff at the standalone PMTCT (saPMTCT) sites demonstrated the ability to provide EID services and so onsite DBS sample collection was a challenge. HIV Exposed Infants (HEIs) caregivers were either referred from the rural Primary Health Centres (PHCs) to the closest Comprehensive Care and Treatment (CCT) facility for DBS sample collection, drying, packaging and transportation. This arrangement was characterized by incomplete referrals and high cost for the HEIs Caregivers.

Materials & Methods: 'EID Mentor' Approach (EMA), which involves the use of live HEIs to provide hands-on mentoring on EID, including DBS sample collection, drying, packaging and transportation, to facility staff during micro cluster (*a micro cluster consists of 2-3 nearby health facilities*) meetings and routine facility visits was introduced to the rural health facilities in January, 2014 . These health care workers (HCWs) then became EID Mentors (EMs) that further developed the capacities of their colleagues in nearby supported facilities. EMs phone directories were developed and shared with several nearby health facilities to support timely Dry Blood Specimen (DBS) collection; enabling the EMS to mentor staff of facilities that called them while collecting the DBS. These newly trained HCWs subsequently became EMs also and train others. A retrospective data collation of two targeted indicators from the supported health facilities at 6 months before- and 6 months after- the intervention was conducted. The data were reviewed and analyzed using Microsoft Excel and Statistical Package for the Social Sciences (SPSS) soft wares.

Results: The percentage of eligible HEIs at standalone PMTCT that accessed EID services increased from 24% (pre-intervention) to 81% at 6 months post-intervention ($p < 0.05$). Only 13% of health care workers in selected health facilities demonstrated the ability for EID

services before the intervention, this increased to 87% at 6 months post intervention.

Conclusions: The introduction of EMA demonstrated the value of using empowered HCWs as mentors to their colleagues in ensuring that children born to HIV infected women readily access EID services, especially in the rural areas at no extra cost to both the caregivers and HIV project.

No conflict of interest

Abstract: 47

Prevention of Mother to Child Transmission

Social and contextual confounders associated with non-adherence among HIV+ pregnant women in South Africa

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Background: The prevention of vertical transmission forms an integral component of the South African national response to known drivers for HIV risk and infection. The elimination of mother-to-child transmission in settings such as the Eastern Cape Province demonstrates a serious challenge. Poverty, mythology and stigma combine to challenge adherence to ARVs and clinical visits, which is particularly harmful for pregnant women who risk perinatal infections.

Methods: To investigate social and contextual confounders that may find associations with non-adherence among HIV+ pregnant women, a team of researchers working with the East London Prospective Cohort Study (EMBRACE PMTCT, South Africa) interviewed 671 positive pregnant women. Participants attended one of three obstetric clinics located in tertiary hospital centres (Bisho, Frere or Cecilia Makiwane). Together with biomarker data collection, the team collected information about socio-demographics, HIV disclosure, risk behaviours, and adherence. Data were collected on tablets using guided interview and self-report techniques designed to eliminate biases.

Results: The results demonstrate troubling rates of non-compliance to scheduled visits (19%), non-adherence to medication (44%), and alcohol use (17%) and smoking (7%) during pregnancy. Reasons for missed appointments related to financial barriers, transport, and non-disclosure to an intimate partner and/or family. Missed doses were associated with self-reported forgetfulness and stigma. Univariate analyses show that participants in younger age categories, and those living in urban settings and/or employed were less likely to disclose status: 19-24 years (45%); 25 – 29 years (36.4%); urban settings (35.7%); employed (31.6%).

Conclusions: South Africa presents myriad contexts in which national HIV programming must be delivered. Against this complex and diverse socio-political landscape, eMTC programming struggles to maintain a consistent foothold. Interventions for pregnant women in nuanced settings should account for behavioural risk factors together with age- and culture-appropriate modules. A follow-on study at six months is planned to measure health outcomes of the participants' infants in an effort to better understand the implications of non-adherence in this unique population.

No conflict of interest

Abstract: 48

Prevention of Mother to Child Transmission

Assessment of retention in HIV care and treatment 12 months after initiation in 10 health districts of the Center region of Cameroon

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Background: Retention in HIV care is crucial to achieve viral suppression and control the HIV epidemic. Poor retention in care is a major challenge for ART programs as it threatens the scale up of Anti-retroviral Therapy (ART) coverage. To determine retention in care 12 months after clients have initiated on ART, we conducted an assessment in 22 ART sites across 10 health districts within the Center Region where we implement our program.

Materials and Methods: Data was collected from ART registers in 22 HIV care and treatment centers across 10 districts of the center region. These ART sites are located in rural, semi-urban and urban areas. From the registers, we counted the number of clients that were enrolled during the month of September 2014. This was noted as denominator. Each client within the September 2014 cohort was then traced to determine the number of monthly visits they attended the ART site either for ARV refill or clinical assessment, up to the month of September 2015. Clients found to have visited the ART site for 12 consecutive months were considered to have been retained on treatment. The number of clients enrolled in September 2014 and found to be regular up to September 2015 was recorded as the numerator. We generated the value of ratio numerator to denominator, and then expressed it as a percentage to obtain each ART site's 12 months retention in care. We classified sites in 3 categories for retention rate: Sites with less than 60% retention had a poor retention, Sites with retention ranging from 60% to 80% had an average retention whereas sites with over 80% retention had appropriate retention rate.
Results: Among the ART sites assessed, 16 (73%) were located in urban settings. In all the 22 sites assessed, a total of 764 clients were started on ART. 508 were found to be alive and retained on ART 12 month after initiation, which yielded a retention of 66,5% ranging from 33,3% to 100%. Cumulatively, we recorded the highest retention rate (79,9%) in ART sites located in semi urban settings, followed by the urban sites (64, 4%) then the rural ART sites (42,9%). Overall, approximately a quarter of all sites (24%) had poor retention. Nearly half of the sites assessed (44%) had average retention rates and 7 sites (32%) were determined to have an appropriate retention.

Conclusion: We assessed 22 ART sites and determined that collectively they had a 66,5% retention rate 12 months after initiation on ART. Given that retention in care is required for optimal clinical outcomes in PLWH, strategies to sustain and improve retention rates in ART programs are critical for their success. Hence, we have made recommendations and scheduled follow-up activities to understand factors that hinder retention in our program.

No conflict of interest

Abstract: 49

Epidemiology

Smart Investment to Ending AIDS in Zimbabwe – Hotspot mapping

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Introduction: The hot spot analysis provides and determine populations and geographic areas (hotspots) at risk of HIV infection. Hots pots were mapped based on trend analysis of prevalence, incidence and risk factors and gaps in service provision. The government and partners desire situating key interventions where it can yield highest impact and most relevant target groups so that they can access services that meet their needs. There was need for evidence to support the national decentralization of services policy. This project gives a picture of the areas that need to be focused on with HIV interventions.

Methods: A composite index derived from HIV prevalence, Risk factors (defined by a combination of condom use, multiple sexual

partners, high risk sexual intercourse and young people fertility as a proxy for pregnancy gives and estimation of risk factors by young people), HIV Incidence rates and interventions were normalized to identify the geographic hot spots. Each of the indicators were standardised using the following transformation. $XS_{ij} = (X_{ij} – Min_{Xj}) / (Max_{Xj} – MinX_j)$ j = 1,2, ...4 ; i = 1,2, ...89. Where: XS_{ij} is the value of the standardized observation for district i of indicator j; X_{ij} is the actual value of the same observation; Min_{Xj} and $Max_{X}j$ are the minimum and maximum values of the same observations for component j. The standardised values of each indicator were classified into a 3-point scale (1, 2, 3) where 1 = Low, 2= Medium and 3 = High.

Results: The national incidence is estimated at 0.98% except for Bulawayo with the highest incidence estimated at 2.5% and Matabeleland South at 1.4%. There is a higher risk for the 20 – 24 years to acquire new infections as they are more practising unsafe sex. Female HIV prevalence is generally higher than that of male over the years therefore investments should prioritise female focused interventions. Risk factors are generally high in provinces with the main border entry points, hence the likelihood of having new HIV infections is highest in these areas than any other parts of the country and should necessitates increased investments in prevention activities in these areas. Further risk analysis is needed to understand the risk factors as sex worker incidence is at 10%. Main geographic hot spots cover the entire Matabeleland South Province, two districts in Matabeland North as well as Bulawayo, Mazowe and Marondera. In terms of service delivery, ART and PMTCT have increased steadily from 2004 to 2013 by five times. Most of the potential hotspot areas above, have an average of 800-2000 potential clients per ART site. The allocation of resources was in tandem with hotspots, the HIV spending was homogenous with number of PLHIV.

Conclusion and recommendations: The HIV geographical hotspots are mainly in Matabeleland South and to a small extent in parts of, Mashonaland East and Central. Results of Demographic and Health Survey has pointed Matabeleland South having the highest HIV prevalence. Future investments should also be informed by evidence.

No conflict of interest

Abstract: 50

Epidemiology

Prevalence and incidence of pulmonary arterial hypertension among HIV-infected adolescents and adults in Africa: a systematic review and meta-analysis

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Background: Patients infected with HIV have a direly increased risk of developing pulmonary arterial hypertension (PAH), and of dying from the condition. While Africa carries the greatest burden of HIV infection worldwide, there is unclear data summarizing the epidemiology of HIV-induced PAH.
Objective: To determine the prevalence and incidence of HIV-induced PAH in African adolescents and adults living across Africa.

Data sources: We conducted a comprehensive search of PubMed/Medline completed by manual search of articles published between 1st January 1980 and 31st January 2016, without any language restriction.
Methods: We included studies which have reported the prevalence and/or incidence of HIV-induced PAH in African HIV-infected adolescents and adults residing inside Africa. PAH must have been diagnosed through echocardiography or right heart catheterization.

Results: Overall, 5 studies were included in this review: 3 from Southern Africa (Tanzania, Zimbabwe and South Africa), one from Central Africa (Cameroon), and one from Western Africa (Nigeria). There was no study from Eastern or Northern Africa. No study reported HIV-induced PAH incidence. Ages of participants ranged between 10-78 years, and the proportion of females varied between 52.3%-71%. The cut-off to define PAH was not identical across studies: a pulmonary arterial systolic pressure (PASP) ≥ 25 mmHg vs. ≥ 35

mmHg. The prevalence of PAH in the pooled sample of 980 patients was 11.3% (95% CI, 5.6%–21.3%). This prevalence was comparable according to sex, sample size, adolescents vs. adults, and complaints at inclusion. Contrariwise, the prevalence was 24.1% if the definition criterion for PAH was PASP ≥ 35 mmHg, and 7.2% with PASP ≥ 25 mmHg. The prevalence was higher in Central Africa (29.5%) than in Western Africa (4.0%).

Limitations: Only one database was screened, and there were only 5 studies found eligible. The definition of PAH was not homogenous across studies, and quality assessment yielded low to moderate risk of bias.

Conclusion: The prevalence of HIV-induced PAH in Africa is very high: 11.3%,. Health care providers should regularly screen their HIV-infected patients for PAH throughout the continent.

No conflict of interest

Abstract: 51

Epidemiology

Frequency and factors associated with late HIV diagnosis in Ouagadougou, Burkina Faso

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Background: The new concept of treatment as prevention is right now the main tool to achieve decline of HIV transmission. The efficacy of this approach is closely related to the UNAIDS goal of 90, 90, 90. Hence, the early access to care including antiretroviral initiation is essential. For this purpose, the late HIV diagnosis appears to be a missed opportunity to reduce HIV transmission by lowering of individual infectivity. This study aimed to investigate the frequency and determinants of late HIV testing in Burkina Faso.

Material and Methods: We included all patients with available $CD4^+$ T-cells count at HIV diagnosis from the district 30 hospital of Ouagadougou, Burkina Faso between January 2010 and February 2015. A total of 840 patients were included in the analysis.The late diagnosis was defined as a $CD4^+$ T-cells absolute count less than 200 cells/mm^3 at the time of diagnosis. Logistic regression was used to identify factors independently associated with late HIV diagnosis. Data were analyzed using R software.

Results: Only 9.05% of overall participants had $CD4^+$ T-cells counts over than 500 cells/mm^3. Half of the patients (52.62%) had a late diagnosis. Late diagnosis was twice more frequent in male than female (OR=0.51; CI: 0.34-0.76). Similarly, individuals unexpectedly diagnosed while attending for other medical issues (OR=0.57; CI: 0.38-0.87) or for the prevention of mother to child transmission purpose (OR=0.39; CI: 0.24-0.62) were associated with higher risk of late diagnosis. Adults more than 40 years old and patients with tuberculosis were most late tested (68.4% and 62.1% respectively).

Conclusion/recommendation: Our findings show that HIV-infected patients are in a state of advanced immune depression at the time of diagnosis. Efforts must be focused on males and older adults for testing and starting early antiretroviral treatment. The promotion of early HIV testing requires strategic interventions among late tested population to limit the incidence of new infections and also to reduce the HIV-associated morbidity and mortality in Burkina Faso. Regarding WHO new recommendations about ART initiation, CD4+ T-cells count trends to become less useful patients because only few among them is diagnosed above the threshold of 500 CD4+ T cells count. Thus, plasmatic viral load measurement must be widely implemented and serve definitively as marker to initiate ART and to monitor disease progression and treatment efficacy in low income countries.

No conflict of interest

Abstract: 52

Epidemiology

Prevalence of anti-hepatitis C antibodies and its co-infection with HIV in the Abang Minko'o area of the South region of Cameroon

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Introduction: Co-infection of hepatitis C virus (HCV) with human immunodeficiency virus (HIV) is now a public health concern. Hepatitis-related liver disease is the leading cause of non-AIDS related death among HIV/AIDS patients; since both infections share similar routes of transmission, and HIV infected patients are living longer due to increase access to highly active antiretroviral therapy (HAART). The dual HCV/HIV infection increases the risk of transmission of both viruses. Data on the prevalence of HCV/HIV co-infection in the general Cameroonian population is sparse. The Abang Minko'o area of South Cameroon is a border town with a high commercial turnover, hence we carried out this study to evaluate the magnitude of HCV/HIV co-infection in this area with the aim of contributing to curbing down these infections by identifying some of the peculiar risk factors associated with their prevalence in that area.

Methods: This study was an analytic cross sectional study carried out from November 2014 to April 2015. Approval to carry out this study was sought from the Scientific and Ethical committee of the Faculty of Medicine and Biomedical Sciences (FMBS) of the University Yaoundé I, Cameroon. Permissions were also obtained from all necessary Administrative Authorities for work to proceed. Participants aged ≥ 12 years, who gave their informed consent and were resident in Abang Minko'o for at least three months were included in the study. Those who refused to participate or were less than 12 years old were excluded from the study. Data was collected unto a pre structured questionnaire. Blood samples collected from the participants were screened for HIV using DETERMINE® HIV 1/2a and then IMMUNOCOMB® II HIV 1 & 2 BiSpot if the former was positive. All samples were retested using MUREX HIV Ag/Ab Combo[a]. These samples were also screened for the presence of anti-HCV antibody using IMMUNOCOMB® II HCV. All positive and indeterminate samples were further tested for confirmation using the Architect anti-HCV qualitative assay. Data were analysed with Epi Info version 3.5.3. The Chi square (X^2) test was used. The Odds Ratio was utilized in assessing strength of association that could exist between measured variables. P values <0.05 were considered statistically significant.

Results: A total of 174 participants were included in this study. There were more males 93 (53.4%) than females 81(46.6%) and the mean age was 30.34 ± 13.26 years. The prevalence of anti-HCV antibodies was 6.3% . There was a significant association between HCV sero-positivity of the participants and a past history of injectable drug treatments (p = 0.01), and minor surgery (p = 0.03). The prevalence of HIV in this study was 6.9%. The prevalence of HIV in females (7.4%) was higher than for males (6.5%). HCV/HIV co-infection was found in 3 cases (1.7%).

Conclusions: This study showed that the prevalence of HCV and HIV co-infection in the study population was 1.7%. A high prevalence of anti-HCV antibodies (6.3%) and HIV (6.9%) infections were also noted. The major risk factors associated with HCV infection were: A history of injectable drug treatment and minor surgery.

No conflict of interest

Abstract: 53

Epidemiology

Sero-discordance among women attending antenatal clinics in Nigeria – a case for broadening the focus of prevention interventions

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Background: The focus of HIV interventions for pregnant women has largely been on ensuring zero new paediatric infections. A key consideration should also be treatment as prevention of horizontal transmission to partners of HIV positive pregnant women in the context of serodiscordance partnership. Evidence suggests that the magnitude of serodiscordance among pregnant couples is high and is a significant window for transmitting new HIV infections. The few studies reporting serodiscordance have looked only at partners of HIV+ pregnant women. This study determined the rate and pattern of serodiscordance among partners of pregnant women attending ANC in Nigeria irrespective of serostatus of the pregnant woman in order to assess the extent of the possible window of HIV infection.

Methods: This is a retrospective study. From services supported through the USAID-funded GHAIN project, aggregated data of 31,376 pregnant women and their partners in 185 public health facilities from 2007 to 2011 were used to establish rates and pattern of HIV sero-discordance (HIV+ pregnant woman and HIV- partner or HIV- pregnant woman and HIV+ partner). We compared the ranking of serodiscordance rates to the ranking of estimated new infections per region.

Results: 1,450,139 pregnant women were tested at ANC. Of this, 2.2% (31,376) of their partners were tested. Among the 31,376 partners tested, serodiscordance was 17.0%. In 15.6% of partners, the pregnant woman was HIV+ and partner HIV negative while in 1.4% the pregnant woman was HIV- and partner HIV positive. The rate of HIV discordance amongst tested partners was highest in the south-east (39.9%), and lowest in the south-west (10.3%). The ranking of the magnitude of serodiscordance was not perfectly aligned with the pattern of estimated new HIV infections by region.

Conclusions: Serodiscordance is widely prevalent with regional variation. Interventions to improve HIV testing and counseling amongst partners of pregnant women irrespective of serostatus should be vigorously implemented. Understanding drivers for regional variations will help target interventions.

Conflict of interest: The work on which this paper is based is funded by PEPFAR through a cooperative agreement with USAID.

Abstract: 54

Epidemiology

Seroprevalence of Dengue virus infection in antiretroviral naïve HIV-1 infected people

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Introduction: Dengue virus (DEN) belong to the Flaviviridae family, a group of four closely related arboviruses in the genus Flavivirus. Aedes aegypti and Aedes albopictus are the mosquito vectors of the DEN viruses, and humans are the primary host. In Cameroon like other central African countries people living with the Human Immunodeficiency Virus (HIV) can also be infected with Dengue virus. There is little information on the impact of coinfection with HIV-1 and Dengue virus on the long term management of HIV-1. Previous studies have shown evidence of DEN transmission and persistence in Cameroon. However no data has been reported on the consequence of Dengue virus infection on the long term management of HIV infection.

Method: From 2011 to 2015 we monitored the prevalence of DEN in 2990 participants ranging

in age from 1 to 72 years. The study consisted of 1986 HIV-1 positive and 1004 sero-negative participants respectively. Altogether 2285 adults including 1409 HIV-1 positive and 876 HIV-1 negative people were recruited for this study. On the other hand 705 children consisting of 577 HIV-1 positive and 128 seronegative children participated in the study. The diagnosis of dengue infection was through through the detection of NS1 Ag and anti-IgG/IgM antibodies in plasma using CTK Biotech Duo Rapid test (CTK Biotech, Inc.). While HIV diagnosis was performed using the Alere Determine™ HIV1/2 test kit (Alere DetermineTM HIV-1/2 is a usual read, qualitative immunoassay for the detection of antibodies to HIV-1 and HIV-2) and KHB Shanghai HIV 1+2 diagnostic test kits (Kehua Bio-engineering Co., Ltd. China). In addition helper CD4 T cell count and plasma HIV-1 viral load was also performed in all HIV-1 positive participants.

Result: The prevalence of Dengue virus infection in seronegative participants was significantly higher (P<0.001) than in HIV-1 positive people (24.3% versus 17.62%). HIV-1 positive patients (221) showed less anti-NS1 IgG antibodies than the uninfected HIV-1 (196) people (P<0.0001). Even though HIV-1 infected people generally showed lesser anti-NS1 IgG antibodies when adult were compared with children they showed significantly higher (P<0.0001) IgG antibodies to DEN NSI (72.6% for adult versus 26.4% for children). Detection of the NS1 Ag was also more prevalent in children (P<0.001) than adults (58.3% in children compared to 12.9% in children). The prevalence of anti-NS1 IgM antibodies detection was generally low compared to anti-NSI IgG antibodies. There was no significant difference between seropositive and seronegative participants with respect to the prevalence of IgM antibodies.

Conclusion: Thus from 2011 to 2015 Dengue virus infections circulated in both seropositive and seronegative Cameroonians. The consequence of Dengue virus coinfection of seropositive people was an augmented persistence of the Dengue virus NSI antigen. This is probably due to the diminished ability of HIV-1 infected people to clear the virus. This conclusion is supported by the diminished prevalence of anti-NSI specific IgG in seronegative people.

No conflict of interest

Abstract: 55

HIV Prevention

Challenges in HIV screening among blood donors; a gap to be filled

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Introduction: HIV/AIDS remains an issue of major public health concern worldwide, over four decades since its discovery, with about 35 million people living with it, 71% of whom are in Sub-Saharan Africa (SSA). Blood transfusion is the most efficient (95-100%) route of its transmission. Despite stringent screening methods that may be in place, there is always a residual risk for HIV transmission due to the eclipse/window period. This risk is increased by the predominance of family/replacement donors in our setting (about 70-80%), reported by the World Health Organisation to carry higher risks of infectious transmission, compared to volunteer non-remunerated donors. Thus, this study was carried out to investigate the phenomenon of residual risk for HIV infection from blood donations collected during the window/eclipse periods at the Yaoundé University Teaching Hospital (YUTH).

Materials and Methods: A cross-sectional study was conducted among consenting HIV-negative blood donors in the Haematology and Transfusion Service of the YUTH who reported to collect the results of the tests carried out on their blood at the time of blood donation. A 5 ml blood sample was collected from these for post-donation HIV screening. Rapid tests and enzyme linked immune-sorbent assay (ELISA) techniques were used for HIV antibody and antigen detection. There were 90 consenting donors that met the inclusion criteria and constituted the study population. The mean time lapse between blood donation and the sample collection was 16.87±4.56 days [range 8-32]. Data collected was entered in Microft Office for Windows and cleansing was done by double verification for any inconsistent or aberrant values/modalities. Data analysis was then

performed using EPI-INFO version 7.0.9.7 for univariate and bivariate analysis. Associations were considered statistically significant at P-values < 0.05.

Results: Out of these 90 participants 3(3.33%) were confirmed HIV positive on the second collection. The most frequent risk factors for HIV amongst these blood donors between blood donation and sample collection were sexual relationship 64 (71.11%), multiple sex partners 13(20.31%), the lack of condom use 27 (42.19%), drunkenness 15 (16.67%) as well as pricks by sharp objects 12 (13.33%). No association was found between any of the risk factors considered in the study and the HIV status of donors.

Conclusion: These findings suggest that the potential for HIV transmission through blood transfusion remains very high, and that some blood donors may be within the eclipse/window periods at the time of blood donation. There is persistent need for stringent criteria for the medical selection of donors and for more efficient screening techniques in all blood transfusion services, especially of SSA.

No conflict of interest

Abstract: 56

HIV Prevention

Predictive factors of clinical and biological evolution of hiv patients under antiretroviral in douala, Cameroon

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Introduction: Les données concernant les bons facteurs pronostiques sur l'évolution du traitement des patients VIH + sont rares dans un contexte comme au Cameroun. Cette étude vise à déterminer les facteurs associés à une bonne évolution des patients séropositifs à Douala, pour les cinq dernières années.

Matériel et méthodes: Cette étude transversale analytique et transversale réalisée dans trois hôpitaux de Douala Les données ont été recueillies sur la base d'un questionnaire pré-établi, standardisé et anonyme. Les informations relatives à la gestion des patients a été extrait des dossiers médicaux, des registres de consultation et de la pharmacie des unités de soins. Nous avons utilisé les fichiers de patients adultes séropositifs qui ont reçu un traitement antirétroviral pendant au moins 06 mois. Une bonne évolution a été observée chez les patients présentant une augmentation de poids ≥ 10% de leur poids initial et / ou une augmentation du taux de CD4 ≥ 500 / mm3. Les tests du chi carré et étudiants nous ont permis de présenter les facteurs associés à une bonne évolution.

Résultats: Un total de 1.057 dossiers ont été inscrits Le marié a présenté une bonne évolution par rapport aux célibataires (âge moyen des patients 39 ± 10 ans, le sex - ratio M / W 0,46.). Ceux qui avaient un poids moyen de départ ≥ 59,4 ± 11,6 a eu une bonne évolution par rapport à ceux ayant un poids moyen inférieur à lui. Aucune différence significative entre les différents stades de la maladie (P = 0,1). OMS Seule l' encéphalite et la tuberculose ont révélé des différences significatives dans le groupe de ceux présentant une maladie opportuniste. Les patients atteints de la moyenne initiale CD4 ≥ 168 ± 152 ont connu une bonne évolution (P = 0,008). Aucune différence significative entre les différents protocoles de traitements ARV a été observée (p = 0,093). L'absence de maladies opportunistes [OR 2,58 (1,38-4,85)], le statut marié [OR 2,39 (1,25-4,52)], et une bonne adhérence [OR 2,40 (0 , 16-3,20)] ont été révélés comme facteurs prédictifs d'une bonne évolution.

Conclusion: Il montre que marié, le poids, le nombre de CD4 lors de l' initiation, l'absence de maladies opportunistes affecte le bon développement de patients VIH +. D' où le renforcement d'un dépistage et d' un début de prise en charge.

No conflict of interest

Abstract: 57

HIV Prevention

Isotype profiles of antibodies in plasma from antiretroviral naive HIV-1 infected persons specific to HIV-1 gp120 expressed from wild type and mutant Lec1 CHO cells

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Background: The entry of HIV-1 into its target cell is mediated by an interaction between the gp120 of the virus and host cell receptors. Specific antibodies to the HIV-1 gp120 can be of enormous help in preventing or blocking this interaction. However stimulation of these neutralizing antibodies has proven difficult to achieve through vaccination because of the lack of a suitable antigen mimicking the native gp120 from HIV-1. The N-glycosylation of gp120 varies depending on its source and has been demonstrated to affect gp120 recognition by serum antibodies. Since the viral env gp120 is a potential antigen for vaccine development, a recombinant gp120 was produced from mutant lec-1 CHO cell line which enables the expression of HIV env gp120 with simple mannose sugars like the native HIV-1 virus. The overall objective of this study was to determine IgG antibody isotypes in plasma from anti-retroviral naïve HIV-1 infected people specific to HIV env gp120 expressed from wild type and mutant lec1 CHO cells.

Method: Manosylated HIV env gp120 was purified from the supernatants of stably transfected mutant lec1 CHO cells using a flag tag. We next assess antibodies specific to HIV env gp120 in plasma obtained from participants. This was a cross sectional study using plasma samples voluntarily donated by consented eligible participants. Using indirect antibody-antigen ELISA we determined the IgG isotypes specific to the gp120 expressed from wild type and mutant lec1 CHO cells.

Results: The results obtained showed that all IgG isotypes were detected for both the manosylated and CHO wild type expressed gp120. However a great variation was noticed in various participants as well as low antibody titer measurements with the group titer ranges [200-800] and [1600-6400] being very predominant over [12800-15600] as well as the isotypes IgG1 and IgG3 were also very predominant in both antigens. Although all IgG antibody isotypes including IgG1, IgG2, IgG3 and IgG4 were dictated there was no significant between antibody titers directed to manosylated gp120 and wild type gp120.

Conclusion: Thus manosylated gp120 expressed from Mutant lec1 CHO cells was efficiently recognized by gp120 specific antibodies in HIV positive plasma. We believe that this novel gp120 based immunogen could be use to enhance humoral responses targeting HIV env gp120.

No conflict of interest

Abstract: 58

Community/civil society engagement

"I HAVE SOMETHING TO SAY!" Bringing youth voice to the forefront of the public health discourse in South Africa

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Background: Spectrum data released by WHO in 2014 revealed that HIV-related deaths among adolescents is rising, particularly in Sub Saharan Africa. To understand how best to deliver adolescent friendly services that may serve to mitigate poor health outcomes, a consortia of expert partners (public/private/academic) conducted extensive literature reviews to identify evidence-based interventions that address drivers for adolescent mortality. These were examined through lenses of gender; youth-friendly services; prevention; sexual and mental health; substance abuse; and treatment access. The outputs revealed that youth-informed programming was lacking across all frameworks. In response, a national Youth Summit pilot was planned with support from Janssen's New Horizons initiative, dubbed the 'I have something to say!' campaign.

Methods: Participation was solicited via social media and advertised in schools across all 9 South African Provinces. The summit was held at the University of Cape Town in September 2015. 16 young people (14-21 years) from 7 of South Africa's provinces participated. While the majority of participants were HIV+ youth, delegates were represented other health and societal issues: survivors of child sexual abuse, those exposed to rampant substance abuse and those struggling with mental health issues. A youth-driven format was developed to ensure that the participants were comfortable and encouraged to be authentic in their responses. A peer facilitator oversaw the dialogues, which yielded important perspectives for considerations at the national level.

Results: With specific reference to HIV, the youth formulated 4 specific recommendations, namely: 1) start HIV education at a younger age; 2) organise training workshops for peer educators; 3) eliminate healthcare workers who are not passionate; and 4) encourage young people to become doctors and nurses.

Conclusions: The organizers have concluded that the importance of engaging youth prior to developing health services intended to serve them is essential to guarantee effectiveness. Youths from this programme will be engaged to build capacity among new youth leaders in future in a follow-on summit in 2016. The collaborators foresee the potential to inform government departments positioned to address adolescent-centred issues via increased inclusion of youth perspectives in health and social welfare programmes.

No conflict of interest

Abstract: 59

Community/civil society engagement

Traditional leaders increase HTC uptake: The Case of Chief Mulonga's Chiefdom, Solwezi District, Zambia

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Background: Success in achieving the WHO's 90/90/90 standard for HIV programs is predicated on reaching more HIV+ individuals with HIV testing and counselling (HTC) services and linking them to care. Traditional leaders who are gate keepers in the community can play an important role in facilitating access to HTC services for their subjects. We expanded links with traditional leaders in Northwestern Province Zambia to facilitate the achievement of higher levels of HTC.

Materials & Methods: The Zambia Prevention Care and Treatment Partnership (ZPCTIIB) engaged community leaders as promoters of HIV/AIDS services. We conducted sensitization workshop for 10 traditional leaders in Lwamala in chief Mulonga's Chiefdom. After the workshop, the chief of the Kaonde people in Solwezi District noted that the community mobile HTC primarily reached younger subjects possibly at the expense of older individuals in his kingdom.

The facility Staff at the local Health Centre (Lwamala) conducted, through the leadership of the chief, the **door to door** HTC as part of the community based HTC services. Using the door to door model, three episodes of HTC were conducted over a period of three months from September to November 2015.

Results: During the intervention, 3488 people where reached with HTC out of which 23 tested HIV positive 3488 compared to the previous 2000 (4 HIV+) reached during mobile CT before the involvement of chiefs and traditional leaders, representing a 74 % higher yield.
The community & their leaders should be engaged from the beginning prior to implementation of HTC services to determine the best approach to use for community based interventions such as HTC. Comparing the two approaches in Chief Mulonga's chiefdom, the door to door approach nearly doubled HTC uptake in that area and yielded 19 (0.5%) increase in number of HIV+ individuals identified.

Conclusion: Working with community leaders improves access to HIV/AIDS Services. Traditional Leaders played a key role in the door to door model access that resulted in the increase of HTC uptake in Chief Mulonga's chiefdom. This method can be replicated in other rural settings.

No conflict of interest

Abstract: 60

Community/civil society engagement

Perception de la qualité de l'offre des services et faible participation communautaire en PTME au Cameroun

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Contexte: Le Cameroun a élaboré en 2011 son plan d'élimination de la transmission mère enfant du VIH (TME) 2011-2015. Son but était d'améliorer la survie maternelle et infantile à travers l'élimination des nouvelles infections pédiatriques à VIH à l'horizon 2015. En 2014, une analyse situationnelle sur l'eTME a été faite. Malgré des progrès observés au niveau national dans la lutte contre le VIH, l'appropriation par les communautés des interventions à fort impact sur la PTME demeure faible. Ceci pourrait limiter l'atteinte des objectifs 90-90-90 sur le plan communautaire. L'objectif de cette présentation est d'analyser les perceptions des bénéficiaires sur l'offre de services de PTME et évaluer la participation des communautés dans le cadre de la PTME.

Méthode: L'étude était qualitative. Les données ont été collectées dans les régions de l'Extrême-Nord, le Centre, l'Est, le Littoral et le Sud-ouest. 816 personnes ont été interviewées parmi lesquelles : les bénéficiaires, les leaders communautaires et les prestataires de soins.

Résultats: Au Cameroun, la faible utilisation des services de PTME par les femmes était associée à plusieurs raisons : l'insuffisance quantitative du personnel dans les structures sanitaires qui entrainerait la longue durée d'attente et l'insuffisance voire l'absence de l'écoute ; le manque de professionnalisme des prestataires qui est responsable de la médiocrité de l'accueil, le non-respect de la confidentialité et la stigmatisation.
Les communautés quant à elles n'étaient pas suffisamment enrôlées dans les activités de PTME. Lorsqu'elles l'étaient, leurs activités ne se limitaient qu'à la mobilisation sociale. Leur contribution à l'accompagnement psychologique, spirituel et social dans le domaine de la PTME n'était pas explorée.

Conclusion: La formation du personnel à l'éthique dans la gestion des bénéficiaires et la délégation de certaines tâches des soignants à la communauté participerait à l'atteinte des objectifs 90-90-90.

No conflict of interest

Abstract: 61

Community/civil society engagement

Expert Patients (EPs): Untapped Resources at HIV Care & Treatment Clinics, Tanzania.

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Background: Tanzania with 47,783,000 estimated population (WHO, 2014) and generalized HIV epidemic of 5.1% prevalence (THMIS, 2012), suffers a critical shortage of human resources for health (HRH) at 56.38% (MOHSW, 2014). PAI/TPDF support 48 military health facilities (HFs) to provide comprehensive HIV/AIDS services since 2006. In 2014 the program introduced expert patients (EPs) so that to provide non-clinical services at its 14 HFs with high volume of PLHIV at HIV care and treatment clinics (CTCs). The willing PLHIV who are enrolled into CTCs are trained according to ministry of health and social welfare (MOHSW) standards to become an EP and volunteer at CTC. The objective of EPs involvement is to fill the gap of HRH shortage. Currently, there are 45 trained EPs assisting some activities in the CTC. The tasks shifted to EPs include cleaning CTC, sorting files, triaging, registering patients, delivering adherence counselling and health education, sharing experiences with peer PLHIV, collecting laboratory results, escorting patients to other HIV service delivery outlets, weighing patients, tracking loss to follow up (LTFU). These tasks were normally done by clinicians and nurses. The EPs` job is coordinated by a senior nursing officer. Day-to-day activities is supervised by the CTC nurse in-charge.

Photo 1: EPs` coordinator insisting a key issue during EPs experience sharing meeting, Sept 2015.

Methods: Sixteen EPs from 8 CTCs were interviewed using a structured questionnaire on the benefits of their work and if are accepted by health care workers (HCWs) and CTC attendees. The EPs coordinator and 14 HCWs have been interviewed on the effectiveness of utilizing EPs. A review of LFTU register was done in 8 CTCs.

Results: 45 EPs were trained on the basics of HIV/AIDS services during January 2014-February 2016 to become knowledgeable on the tasks. Total of 3,780 LTFU were recorded and followed up by the EPs. Of them 1,086 (29%) LTFU were tracked back to CTC to restart HIV care & treatment services; 1, 030(27%) were found self-transferred to other clinics for HIV care & treatment services; 66 (2%) were found died while 1,598 (42%) were unknown in their area of residence (Tab 1). The unknown outcome of the LTFU were neither available in their phones nor known by their local leaders/close relatives as is documented in the basic demographic part of the patient`s National CTC2 treatment card. In the absence of EPs the 29% LTFU could not return back to CTC for HIV management. We could also not be able to find out PLHIV who are attending treatment in other CTCs or those who have died. This result indicates the importance of involving EPs in some CTC activities.

Table 1: LTFU tracked by EPs in eight CTCs , June 2014 to February 2016:

S/No	HF Name	Total LTFU	LTFU Outcome			
			Tracked back to ctc	Self transferred out	Died	Unknown
1	Ruhuwiko MH	421	235 (53%)	4 (1%)	16 (4%)	166(42%)
2	Makambako HC	534	34 (6.4%)	28 (5%)	12 (2%)	460 (86.6%)
3	Mwanza MH	363	250 (69%)	46 (12.7%)	1 (0.3%)	66 (18%)
4	Mzinga MH	14	2 (14.3)	9 (64.3%)	0	3 (21.4%)
5	Mbeya MH	No data	36	125	No data	No data
6	Milambo MH	260	30(12%)	90 (34%)	70	70(27%)
7	Lugalo GMH	1598	463 (29%)	698 (44%)	17 (1%)	420 (26%)
8	Mwenge RCH clinic	499	36 (7%)	30 (6%)	20 (4%)	413 (83%)
TOTA		3,780	1,086 (29%)	1,030(27%)	66 (2%)	1,598 (42%)

Conclusion: Effective file handling, administration of appointment, peer counselling lead to improved data handling, shortened waiting time, better treatment adherence and retention of CTC attendees. PAI/TPDF suggests the MoHSW officially endorse the presence & work of EPs thus reduce the HRH crisis, ensure sustainability and reach the 90-90-90 UNAIDS targets to end HIV epidemic.

No conflict of interest

Abstract: 62

Health systems and HIV

Situation de la prise en charge du vih pédiatrique au Cameroun

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Contexte: La Transmission Mère-enfant du VIH étant le principal mode de contamination du VIH chez les enfants âgés de moins de 5 ans, plusieurs stratégies de santé publique ont été mises en place au Cameroun. Toutefois, au moment où la prise en charge du VIH/Sida chez les adultes et les adolescents connait des avancées significatives, la situation du VIH chez les enfants demeure préoccupante. L'objectif de l'étude était de faire l'analyse situationnelle de la prise en charge pédiatrique du VIH (PECP) sur la période allant de 2008 à 2013.

Méthodes et outils de collecte : L'étude effectuée en décembre 2014, était transversale, quantitative et qualitative. L'analyse des données quantitatives était descriptive tandis qu'une analyse de contenu a été faite pour les données qualitatives. Les principes éthiques ont été respectés.
Dans les dix régions du pays, 22 formations sanitaires (11 CTA et 11 UPEC) ont été visitées. Les cibles étaient : les décideurs nationaux et régionaux impliqués dans la PECP et des prestataires de soins et acteurs communautaires de PTME/PECP.

Résultats : L'environnement pour la fourniture de services
Les stratégies de mise précoce sous traitement au niveau national étaient: la révision des documents normatifs (dossiers médicaux ; nouvelles directives/guide, curriculum de la formation); la formation. Neuf textes réglementaires nationaux (3 pédiatriques) relatifs à la gratuité des protocoles de Thérapie Anti Retroviral (TARV) et de certains examens biologiques.
La durée médiane au poste des prestataires de soins était de 4 ans, certaines ressources humaines (psychologues, pharmaciens) étaient absentes de la PECP.
De multiples partenaires techniques et financiers engagés dans la PECP.
L'accès aux soins, soutien et traitement pédiatrique du VIH dans les formations sanitaires enquêtées
Les services de vaccination n'étaient pas impliqués dans l'identification et le suivi des enfants exposés ou infectés par le VIH.
Les sites de collecte des échantillons Dry Blood Spot (DBS) pour le diagnostic précoce étaient en augmentation. Les régions en abritant le plus étant le Centre (535), le Nord-Ouest (312) et le Sud-ouest (202). Le temps écoulé entre l'envoi des DBS au laboratoire de référence, le retour du résultat à la formation sanitaire, et l'annonce du résultat aux parents fluctuait entre un et six mois (moyenne de 1, 7 mois).
La tarification des examens de suivi était variable et peu accessible au niveau opérationnel.
Les consultations des nourrissons exposés étaient surtout disponibles dans les CTA. Au niveau opérationnel, le suivi in situ de ces derniers était absent et leur référence vers les CTA était préférée.
La qualité des services en charge du VIH pédiatrique dans les formations sanitaires enquêtées
Parmi les 159 prestataires enquêtés : 67,9% avaient reçu une formation spécifique de PECP ; 53,3% avaient des connaissances moyennes sur la PECP ; 45,7% dépistaient systématiquement tout enfant hospitalisé ; 16% le faisaient chez les enfants vus en consultation (vaccination, consultation pédiatrique, etc.).

Conclusion: De nombreux gaps ont été observés dans la PECP. Nous suggérons le développement des portes d'entrée à la PECP, la révision des dispositions concernant le suivi biologique et clinique, la formation.

No conflict of interest

Abstract: 63

Health systems and HIV

Mise en évidence de l'importance de la détresse psychologique chez les patients de VIH

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Introduction: Selon l'OMS, en 2014, il y a environ 660.000 de personnes vivant avec le VIH. L'UPEC de Bikop, située en zone rurale, accompagne 671 personnes vivant avec le VIH sous antirétroviraux. Depuis plusieurs années nous voyons l'importance de la prise en charge psychologique pour l'acceptation de la maladie, l'adhérence au traitement et le suivi global du malade

Objectifs: Détecter précocement les symptômes de détresse psychologique (anxiété ou dépression) chez les personnes VIH positives, afin d'améliorer leur prise en charge pour une meilleur qualité de vie·Valider l'importance d'une prise en charge psychologique dans toute maladie chronique.

Patients et méthodes: De septembre 2015 à février 2016, 200 malades séropositifs sous antirétroviraux depuis au moins 1 an ont répondu volontairement, avec l'aide d'un soignant, à un questionnaire incluant l'*Hospital Anxiety and Depression Scale* (*HADS*), classant les symptômes d'anxiété et de dépression comme absents, suspectés ou avérés. Ont été inclus, les patients des 2 sexes, âgés de plus de 21 ans, tous stades confondus.

Résultats: 79% des interrogés étaient des femmes, 54% avaient entre 30 et 50 ans. On relevait 40% d'anxiété avérée et 12% de dépression avérée. 91% des patients ont partagés leur statut avec un proche. La réaction de l'entourage a été un soutien dans 67% des cas, des insultes (13%), un abandon (5%), des violences physiques (1%). 92% souhaitent plus d'informations sur leur maladie. Un groupe de parole intéresserait 87% des sondés.

Conclusions:
1. Les symptômes de détresse psychologique sont fréquents chez les malades du VIH. Le personnel sanitaire doit apprendre à détecter ces symptômes. L'utilisation d'une échelle validée permet de les objectiver et d'en évaluer la gravité.
2. Cette détresse psychologique détectée chez les malades chroniques de VIH peut être relevée chez les autres maladies chroniques
3. Suite a ces résultats plusieurs groupes de parole ont été débuté.
4. La présence d'un psychologue clinicien est incontestable au sein d´une équipe pluridisciplinaire pour une meilleure prise en charge.

No conflict of interest

Abstract: 64

Health systems and HIV

Assessing Impact of Community-based Antiretroviral Therapy and its Scale Up: Perspectives from four priority Local Government Areas in Lagos, Nigeria

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Introduction: Community-based antiretroviral therapy (cART) delivery is effective in improving the early identification of HIV-positive clients, access to treatment and quality of health outcomes of people living with HIV. The cART project scale-up (cART Plus) aimed to further improve on those gains in achieving more individual testing in the community, improve ART coverage, strengthen linkage and retention in care and subsequently achieve viral suppression over the long-term; in line with the UNAIDS 90-90-90 targets.

Materials and Methods: The cART project is being supported by the United States Agency for International Development (USAID) through the Strengthening Integrated Delivery of HIV/AIDS Services (SIDHAS). The four priority Local Government Areas (Agege, Ajeromi-Ifelodun, Apapa & Surulere LGAs) in Lagos State, South West Nigeria were selected based on epidemiological and mapping indices. Community volunteers were recruited and trained in thematic areas to subsequently work under the supervision of Community-based Organizations (CBOs) to carry out community mobilization, household testing and counselling, identification and referral of HIV clients to health facilities, tracking and follow up of defaulters as well as documentation and reporting of service output data using approved tools – whilst ensuring quality service and utmost confidentiality.

Results: Data analysis spanning October to December 2015 in these 4 LGAs showed that the indices assessed significantly improved upon cART scale-up (cART Plus). Number of individuals counselled, tested and received results for HIV in the community {*cART* (Oct: 24 307); *cART Plus* (Nov: 61 532; Dec: 50 049)}. Number of individuals tested HIV-positive {*cART* (Oct: 65); *cART Plus* (Nov: 364; Dec: 268)}. The positivity rate in the general population being {*cART* (Oct: 0.27%); *cART Plus* (Nov: 0.59%; Dec: 0.54%)}. Number of persons newly enrolled into the ART programme for PreART care in the community {*cART* (Oct: 34); *cART Plus* (Nov: 283; Dec: 214)}. Percentage enrolment {*cART* (Oct: 52.3%; *cART Plus* (Nov: 77.7%; Dec: 79.9%)}. Number of persons newly started on ART in the community {*cART* (Oct: 13; *cART Plus (*Nov: 106; Dec: 123)}.

Conclusions: The cART delivery scale-up has shown to improve uptake and accessibility of treatment. This concept could be adopted in more resource-limited settings to improve ART coverage. However, efforts need to be channeled into advocacy for community ownership as community programs need to be driven, owned by and embedded in the communities.

No conflict of interest

Abstract: 65

Stigma and discrimination

Stigma and discrimination associated with HIV/AIDS in health care settings: a comparative study in two hospitals of different categories in Douala-Cameroon

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Background: The response to the human immunodeficiency virus epidemic faces many challenges with stigma and discrimination being two of them. The aim of this study is to determine the extent of effects of stigmatization and discrimination against people living with HIV-AIDS, and the influence of the type of hospital structure, in the manifestations of stigma and discrimination.

Material and Methods: A prospective cross sectional study was conducted among a total of 400 patients, using a pre-tested questionnaire in two antiretroviral treatment centers in Douala: the Day Care Hospital of Laquintinie hospital and the Health Care Unit of Nylon district hospital. An observation form was also filled to evaluate attitudes and behaviour of health care providers towards patients. Chi-Square test and Fisher test were used to test association between two variables, then multi logistic regression tests were done to check predictive factors of discrimination. The level of significance was chosen at $p<0.05$.

Results: Among the participants, 104 (26%) patients reported having been victims of discrimination. Majority of respondents 267(66.7%) have had secondary educa- tion. Also 165(41.3%) of the patients were single. Laquintinie hospital of Douala has a risk factor for blames and maltreatment ($p = 0.006$) and ($p= 0.009$) respectively. Also 152 (76.1%) patients of Laquintinie vs 103 (51.5%) of Nylon have been victims of stigmatization. The stigmatizing elements were: the name of the

treatment center (p<0.0001) and the unconfidential manner of handling medical files (p=0.04). Among the 400 patients, fifty nine (14.8%) avoided going to the hospital because of past experience of stigma and discrimination and 16 (4%) of participants decided to hide their HIV status in situations of seeking health care ser- vices.

Conclusion: Patients encounter several difficulties and those related to stigma and discrimination experienced in a hospital milieu can particularly constitute obstacles to better health seeking and therapeutic adherence. The human immunodeficiency virus infection response strategy should address stigma and discrimination by reviewing the management of treatment centers, elaborating relevant public health policies and training of healthcare practitioner.

No conflict of interest

Abstract: 66

Health systems and HIV

Clients' satisfaction with HIV treatment services in Bamenda, Cameroon: a cross-sectional study

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Background: Clients have explicit desires or requests for services when visiting hospitals; inadequate discovery of their needs may result in dissatisfaction. Patient satisfaction influences retention in HIV care, adherence to HAART and serves as determinant to HIV suppression. This study's objectives were to quantify clients' satisfaction with HIV services in Bamenda and determine relationship between satisfaction and clients' socio-demographic/structural characteristics.

Methods: A cross-sectional study design was conducted on HIV-positive patients followed-up, on treatment and who consulted in the Bamenda Regional Hospital treatment centre between July and August 2014. Participants consent was sought and data collected on client's level of satisfaction to staff-patient-communication, staff attitudes, privacy and confidentiality and staffing and amenities situations in the hospital. Data was collected using a structured questionnaire interviewer-administered by investigator and trained health personnel. Collected data was analyzed using Epi Info version 3.5.4 and clients' satisfaction measured using frequencies and percentages.

Results: A total of 384 participants took part in this study and their median age was 37 years (IQR: 29-46). Two hundred and seventy-four (71.4%) participants were females. Overall satisfaction with HIV services was 91.2% and participants reported less satisfaction with overall staffing and amenities situation of the centre (3.6%). In the multivariate analysis, only being female, employed and perceiving high number of nurses working at the treatment centre remained significant predictors of overall satisfaction with HIV services.

Conclusion: A high proportion of participants expressed satisfaction with HIV services. However, some dissatisfaction is masked in this high satisfaction level. This dissatisfaction underscores need to improve staff attitudes, staff-patient-communication, employ more staff and build better patient facilities. Future studies need to focus on assessing long-term progression of satisfaction levels with services and determinants of satisfaction involving larger samples in many treatment centres.

No conflict of interest

Abstract: 67

Laboratory monitoring / diagnostics

Virologic failures among HIV-Infected Adults following Initiation of Antiretroviral Therapy in Laquintinie Hospital Accredited Center of Douala, Cameroon

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Introduction: Viral load monitoring is essential as the clinical monitoring and fits into the patients during HIV antiretroviral therapy. But,the implement of these recommendations are difficult in countries with limited resources for several reasons:(1)weakness of health systems, (2) limited health human resources, (3) lack of technical facilities financial resources. The aim of this study was to characterize the virologic failure following.

Methods: A Prospective, population-based cohort study of HIV-positive adults patients on first line antiretroviral therapy at least 12 months (median follow-up, 26 months) was conducted at the Laquintinie Hospital Accredited Treatment Center (ATC) of Douala. HIV RNA (viral load) monitoring (12 and 24 months) done by the LC 96 (Biocentric®) and CD4 T lymphocyte cell count by Flow cytometry.

Results: A total of 51 HIV-infected patients with a mean age of 39.8 (Sd=±10.7) years and a sex ratio F/M of 2.4/1 were followed. Virologic failure were observed among 25.5% of patients after receiving first line ART and 8 (61.5%) of them switched to second-line regimens. Most patients (68.6%) had undetectable viral load at the first viral load measurement, 7 (13.7%) had virologic rebound. 33.3% of HIV-infected patients followed had none or primary education and associated with high risk of virologic failure (OR=8.33, p=0.043, IC95%=0.032-0.944). Of the 13 cases in virologic failure, 61.5% were who initially received 3TC/TDF/EFV three-therapy regimens. Patients with virologic failure had a mean duration of ARVs stock-out 2 times higher (73.2 vs 31.07 days, p=0.005). Of the 51 patients, 52.9% did not respect the time of drug taking and of 13 with virologic failure 12 had not respect it. Poor medication adherence including adherence in medicine taking are associated to virologic failure (OR=9, p=0.031, IC95%=0.017-0.82).

Conclusion: Patients with ARV stock-out and a low educational level had significantly higher risk of virologic failure.

No conflict of interest

Abstract: 68

Antiretroviral Treatment and HIV Care, Comorbidities

Prevalence of cardiovascular diseases in West African HIV-infected adults receiving HAART

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Introduction: Non Communicable Diseases (NCDs) are emerging as an important concern related to the improving of life expectancy of HIV-infected patients, to antiretroviral drug toxicity and also to the chronic inflammation associated with persistent viral replication. Few studies have been conducted in low-incomes countries, particularly in West Africa. We are interested in severe morbidity of cardiovascular diseases (CDV) in HIV-positive patients on antiretroviral therapy. Therefore, we assessed the prevalence of severe CDV and looked for factors associated.

Material and Methods: A cross-sectional study was conducted at the TIDU in Abidjan, from April to July 2015 in patients aged over 18 years, HIV-positive and on antiretroviral therapy for at least 12 months. Data were collected using a structured questionnaire. Clinical assessment, laboratory tests, transthoracic echocardiography, and electrocardiogram were performed for all the patients. All the subjects underwent ultrasonography of the carotid and femoral vessels to evaluate intima media thickness (IMT). The primary endpoint was proportion of patients with severe CDV. Analysis of factors associated was conducted by logistic regression.

Results: 278 patients (mean age 46 years, female 74.5 % were included. The proportion of patients with clinical stage C of the CDC classification was 119 (42.8%) and 229 (82.4%) were with virologic suppression (undetectable viral load). The prevalence of severe CDV was 7.6% [95% CI: 4.74 to 11.32], the majority was represented by pulmonary arterial hypertension

(5%). In multivariate analysis, running time ≤ 30 min , high blood pressure, high rate ALT , high glycemia rate, and low Nadir CD4 count were significantly associated with the prevalence of CVD.

Conclusion: The prevalence of cardiovascular diseases life-threatening was not insignificant. Therefore a standardized screening and risk reduction interventions should be routinely undertaken among HIV-infected patients on HAART and discuss the current approach to primary prevention of CVD in HIV-positive patients is crucial.

No conflict of interest

Abstract: 69

Economics, financing, policy, regulatory and ethical issues

Action intégrée de prévention et prise en charge médicale de l'hépatite virale B sur les sites de prise en charge des PV VIH: Expérience du Centre Médical ALAVI à Ouagadougou au Burkina Faso

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Contexte et justification: Le Burkina Faso connaît une prévalence de l'hépatite B élevée chez les personnes vivant avec le VIH (PV VIH), variant de 10 à 28% dans un contexte marqué par une absence d'un programme national de lutte contre les hépatites. D'où l'intérêt de penser à des stratégies innovantes. Cette communication a pour objet de présenter le dynamisme de ALAVI dans la lutte contre l'hépatite B au Burkina Faso.

Objectif Améliorer l'accès aux soins et aux services de prévention de l'hépatite B

Population cible Les PV VIH Les populations clés Les usagers du Centre Médical ALAVI

Stratégies Formation du personnel de santé et des conseillers communautaires Education pour la santé relative à l'hépatite B et au VIH Dépistage gratuit de l'hépatite B Prise en charge médicale des cas positifs à l'AgHBs Subvention du coût de la charge virale ADN VHB (Centre Muraz) Proposition de la vaccination à coût subventionné.

Résultats Formation d'un médecin sur la prise en charge médicale des hépatites virales Formation des 10 conseillers psychosociaux sur la prévention de l'hépatite B En 7 mois : - sur 261 PV VIH (132 F, 129 H) dépistées, 32 (13 H, 19 F) étaient positives à l'AgHBs soit une proportion de 12,26% ; - sur 54 HSH dépistés, 9 étaient positifs à l'AgHBs soit une proportion de 16,66% - 11 personnes non infectées par le VIH sont suivies pour l'infection à VHB - 7 HSH sont suivis pour l'infection à VHB dont 3 cas de coinfection VIH-VHB.

Conclusion L'expérience acquise par les centres communautaires dans la lutte contre le VIH peut être utilement mise à profit pour la lutte contre les hépatites en Afrique. L'accès au bilan de suivi, le coût élevé des ARV pour les monoinfectés VHB et le coût élevé des vaccins restent des défis à relever

No conflict of interest

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INTEREST

AUTHOR INDEX