Reviews in Antiviral Therapy & INFECTIOUS DISEASES
7
2013
JOURNAL OF ABSTRACTS AND CONFERENCE REPORTS FROM INTERNATIONAL WORKSHOPS ON INFECTIOUS DISEASES & ANTIVIRAL THERAPY

Abstract Book

5th International Workshop on HIV Pediatrics

28 - 29 June 2013, Kuala Lumpur, Malaysia

5th International Workshop on HIV Pediatrics

28 – 29 June 2013, Kuala Lumpur, Malaysia

Abstracts

Oral presentations

Abstract: O_01

Treatment of pediatric HIV infection

Lopinavir hair concentrations predict virological failure among Asian children

W. Prasitsuebsai[1], S.J. Kerr[1], T.H. Khanh[2], J. Ananworanich[1], D.C. Viet[3], L.N. Van[4], N. Kurniati[5], P. Kosalaraksa[6], V. Sirisanthana[7], K. Chokephaibulkit[8], N. Thammajaruk[1], T. Singtoroj[9], S. Teeraananchai[1], M. Gandhi[10], A.H. Sohn[9]

[1]The HIV Netherlands Australia Thailand Research Collaboration, Medicine, Bangkok, Thailand; [2]Children's Hospital Number 1, Pediatrics, Ho Chi Minh City, Vietnam; [3]Children's Hospital Number 2, Pediatrics, Ho Chi Minh City, Vietnam; [4]National Hospital of Pediatrics, Pediatrics, Hanoi, Vietnam; [5]Cipto Mangunkusumo General Hospital, Pediatrics, Jakarta, Indonesia; [6]Faculty of Medicine Srinagarind Hospital, Pediatrics, Khon Kaen, Thailand; [7]Research Institute for Health Sciences, Medicine, Chiang Mai, Thailand; [8]Faculty of Medicine Siriraj Hospital, Pediatrics, Bangkok, Thailand; [9]TREAT Asia/amfAR—The Foundation for AIDS Research, TREAT Asia, Bangkok, Thailand; [10]University of California, Medicine, San Francisco, USA

Background: Protease inhibitor (PI) levels in hair reflect drug uptake from the systemic circulation over the preceding months, and may be useful in assessing long-term exposure to antiretrovirals and the risk of treatment failure.

Methods: Children starting or already on PI-based second-line antiretroviral therapy (ART) were enrolled in a resistance monitoring study in three Southeast Asian countries. Viral load (VL), 30-day visual analogue scales (VAS), pill counts, and lopinavir (LPV) concentrations in plasma and hair were assessed at week 24 after enrollment, using high-performance liquid chromatography in plasma and liquid chromatography/tandem mass spectrometry in hair. Logistic regression was used to evaluate factors predicting virologic failure (VF; VL >1000 copies/mL).

Results: Of 149 children, 47% were female; median (IQR) age was 10.3 (7.9-13.3) years. Median duration of LPV-based ART was 2.9 (1.6-4.2) years, during which time 17 (11%) children experienced VF. Adherence was >95% in 135/148 (91%) by VAS and in 129/145 (89%) by pill count. Median daily LPV dose was 543 (447-619) mg/m2/day. Median trough plasma LPV concentration was 6.7 (4.1-9.6) mg/L in 61 children with available samples. Median LPV hair concentrations were 5.43 (3.21 - 9.01) when VL was >1000 and 9.96 (6.51 - 12.31) ng/mg of hair when VL was <1000 copies/mL. Plasma and hair LPV levels were not strongly correlated (Pearson's correlation coefficient = 0.20; p=0.13). In univariate models, age, sex, body surface area, LPV plasma trough level and <95% adherence were not associated with VF. LPV hair concentrations categorized into quartiles was significantly associated with VF (p for trend = 0.004). Compared to children in the lowest quartile, the odds of VF were reduced by 75% (odd ratio [OR] 0.25; 95% confidence interval [CI] 0.06 – 0.99) in those with LPV hair concentrations between the 25th-50th percentiles, and the odds of VF were identical and reduced by 84% (OR 0.16; 95% CI 0.03 – 0.79) in the highest two quartiles. Results for hair were similar when controlled for any of the other predictors in multivariate models.

Conclusions: Monitoring antiretroviral levels in hair can be a useful and sensitive strategy for identifying non-adherent children at risk for VF.

No conflict of interest

Abstract: O_02

Treatment of pediatric HIV infection

PRINCE1: Safety and efficacy of ATV powder and RTV liquid in HIV-1-infected ART-naïve and experienced infants and children 3 months to 6 years of age

R. Strehlau[1], A. Liberty[2], A. Pena Donati[3], P. Martinez Arce[4], J. Lissens[5], R. Yang[6], D. Butcher[7], S. Biguenet[6]

[1]Rahima Moosa Mother&Child Hospital, Empilweni Services and Research Unit, Coronationville, South Africa; [2]Chris Hani Baragwanath Hospital, HIV Research Unit, Soweto, South Africa; [3]Hospital Sotero Del Rio, Infectology Unit, Santiago, Chile; [4]Hospital Civil Fray Antonio Alcade, Infectious Diseases and Pediatric HIV Clinic, Guadalajara, Mexico; [5]Bristol-Myers Squibb, Global Development Clinical Operations, Braine-l'Alleud, Belgium; [6]Bristol-Myers Squibb, Research and Development, Wallingford CT, USA; [7]Bristol-Myers Squibb, Research and Development, Plainsboro NJ, USA

Background: PRINCE 1 is an ongoing phase 3b prospective, international, multicenter, nonrandomized, two-stage clinical trial assessing safety and efficacy of once daily atazanavir (ATV) powder and ritonavir (RTV) liquid plus optimized dual NRTI background therapy in antiretroviral treatment (ART)-naïve and -experienced HIV-1-infected children ≥3 months to < 6 years of age.

Materials & methods: ART-naïve or -experienced (without prior exposure to ATV) HIV-1-infected children with screening HIV RNA ≥1000 c/mL were enrolled. Stage 1 dosing regimens of ATV powder boosted with RTV liquid were based on 3 weight bands (5-<10 kg, 10-<15 kg, and 15-<25 kg). Treated subjects transitioned into Stage 2 after 48 weeks on ATV powder or upon reaching the age of 6 years or a weight ≥25kg. Efficacy and safety through Stage 1 are presented.

Results: Of 56 treated subjects, 46 completed Stage 1 and 45 entered Stage 2. The majority of subjects (68%) were from Africa. Median age at baseline was 28.5 months (range 3-65 months) and 61% were ART-naïve. Mean baseline HIV RNA and CD4 cell counts were 4.62 $\log_{10}$ c/mL and 1192.6 cells/mm^3, respectively. Using modified intent-to-treat based on the Week 48 ATV powder cohort, at Week 48, 61% of subjects had HIV RNA <50 c/mL, and 74% had HIV RNA <400 c/mL. Viral suppression rates increased with higher baseline weight bands (48%, 68%, and 71% of subjects had HIV RNA <50 c/mL in the 5-<10 kg, 10-<15 kg, and 15-<25 kg bands, respectively, and 67%, 74%, and 86% of subjects had HIV RNA <400 c/mL in the 5-<10 kg, 10-<15 kg, and 15-<25 kg bands, respectively). Viral suppression did not differ significantly between ART-experienced and -naïve subjects, with 60% and 62%, respectively, having an HIV RNA <50 c/mL, and 75% and 74%, respectively, with an HIV RNA <400 c/mL. Mean HIV RNA change from baseline was -2.66 $\log_{10}$ c/ml (-2.61, -2.93, and -2.40 $\log_{10}$ c/mL in the 3 increasing weight bands). Mean CD4 cell count change from baseline was 396.5 cells/mm^3 (respectively 550.1, 225.3 and 373.8 cells/mm^3 in the 5-<10 kg, 10-<15 kg, and 15-<25 kg bands). No new or unexpected safety events occurred and no deaths were reported after enrollment. Five subjects (9%) discontinued due to AEs. SAEs were reported in 11 subjects (20%). Through Week 48 on ATV powder, AEs occurred in 93% of subjects; the most common being upper respiratory tract infections, diarrhea and vomiting.

Conclusions: ATV powder boosted with RTV liquid once daily plus optimized dual NRTI background therapy was effective and well tolerated in this ART-naïve or -experienced pediatric population aged ≥3 months to < 6 years with no new safety findings compared to what has been found in previous ATV pediatric and adult studies.

No conflict of interest

Abstract: O_03

Treatment of pediatric HIV infection

Pharmacokinetics of abacavir and lamivudine once- versus twice-daily in HIV-infected Thai children

P. Punyahotra[1], T. Bunupuradah[2], T.R. Cressey[3], A. Srimuan[2], N. Thammajaruk[2], J. Sophonphan[2], C. Sriheara[2], T. Puthanakit[4], J. Ananworanich[5]

[1]Chulalongkorn University, Department of Pediatrics Faculty of Medicine, Bangkok, Thailand; [2]the Thai Red Cross AIDS Research Centre, HIV-NAT, Bangkok, Thailand; [3]Program for HIV Prevention and Treatment, Faculty of Associated Medical Sciences, Chiang Mai, Thailand; [4]1. Chulalongkorn University Department of Pediatrics Faculty of medicine, 2. the Thai Red Cross AIDS Research Centre HIV-NAT, Bangkok, Thailand; [5]1. the Thai Red Cross AIDS Research Centre HIV-NAT SEARCH, 2. Chulalongkorn University Department of Internal Medicine Faculty of Medicine, Bangkok, Thailand

Background: Abacavir (ABC) and lamivudine (3TC) are approved for once-daily use in HIV-infected adults, but not yet in children. There are limited pharmacokinetic (PK) data of ABC and 3TC in children. We compared the PK of once- versus twice-daily ABC and 3TC in HIV-infected Thai children.

Materials & methods: A single-arm, open-label, crossover study was performed in HIV-infected children aged <18 years, body weight ≥14 kg, HIV-RNA <50 copies/ml, and HLA B5701 negative. ABC and 3TC daily doses by body weight were 300 and 150 mg for 14-<20 kg, 450 and 300 mg for 20-<25 kg, and 600 and 300 mg for ≥25 kg. Originator ABC and 3TC scored tablets were administered. Intensive PK samplings were performed after 14 days of each dose. Daily area under the curve (AUC_{0-24}) and maximum concentrations (C_{max}) were compared by geometric mean ratios (GMR) with 90% confidence intervals (90% CI).

Results: From July to October 2012, 30 children (43% female) were enrolled. Ten children were enrolled in each weight band. Median (IQR) age and body weight were 8.8 (6.6-11.3) years and 21.9 (11.9-30.6) kg, respectively. Antiretroviral regimens were ABC+3TC plus either efavirenz (60%), lopinavir/ritonavir (37%), or nevirapine (3%). Baseline median (IQR) CD4 count was 841(580-1073) cells/mm^3.
All children completed both PK samplings visits without serious adverse events. In overall, geometric mean AUC_{0-24} for once- and twice-daily ABC were 14.43 and 10.65 mg·h/l (GMR 1.36, 90%CI 1.11-1.66), and 17.70 and 18.11 mg·h/l for 3TC (GMR 0.98, 90%CI 0.79-1.20), respectively. By comparing in each weight band, AUC_{0-24} of once-daily ABC were higher than twice-daily in weight band 14-<20 kg (p=0.01). Once-daily and twice-daily 3TC AUC_{0-24} were not significantly different in all weight bands (all p>0.3).
In overall, the GMR (90%CI) of ABC C_{max} for once- and twice-daily regimens was 2.84 (2.18-3.71). Moreover, the GMR (90%CI) of 3TC C_{max} for once- and twice-daily regimens was 1.69 (1.29-2.20).

Conclusion: Our study demonstrated the non-inferiority of the $AUC_{0-24}$of once-daily ABC and 3TC compared to a twice-daily regimen, providingsupport for once-daily dosing of ABC and 3TC in HIV-infected children.

No conflict of interest

Abstract: O_04

Treatment of pediatric HIV infection

A randomized study comparing low dose versus standard dose lopinavir/ritonavir among HIV-infected children with virological suppression

T. Puthanakit[1], P. Suntarattiwong[2], P. Sangkla[3], P. Kosalaraksa[4], C. Ngampiyaskul[5], P. Srisamang[6], S. Kanjanavanit[7], J. Wongsawat[8], W. Petdachai[9], W. Chatchomchuan[10], N. Lertpienthum[11], J. Sophonphan[12], J. Ananworanich[13]

[1]HIV-NAT the Thai Red Cross AIDS Research Centre and Faculty of Medicine Chulalongkorn University, Pediatrics, Bangkok, Thailand; [2]Queen Sirikit National Institute of Child Health, Pediatrics, Bangkok, Thailand; [3]Surin Hospital, Pediatrics, Surin, Thailand; [4]Faculty of Medicine Khon Kaen University, Pediatrics, Khon Kaen, Thailand; [5]PrapokklaoHospital, Pediatrics, Chantaburi, Thailand; [6]Sappasitthiprasong Hospital, Pediatrics, Ubonratchathani, Thailand; [7]Nakornping Hospital, Pediatrics, Chiang Mai, Thailand; [8]Bamrasnaradura Infectious Disease Institute, Pediatrics, Nonthaburi, Thailand; [9]Phrachomklao Hospital, Pediatrics, Petchaburi, Thailand; [10]Udonthani Hospital, Pediatrics, Udonthai, Thailand; [11]Buddhachinaraj Hospital, Pediatrics, Phitsanulok, Thailand; [12]HIV Netherlands Australia Thailand Research Collab, Biostatistics, Bangkok, Thailand; [13]HIV-NAT SEARCH the Thai Red Cross AIDS Research Center and Faculty of Medicine Chulalongkorn University, MD, Bangkok, Thailand

Background: Lopinavir/ritonavir is associated with dyslipidemia. Published data showed adequate lopinavir/ritonavir C_{trough} when 70% of the standard dose was used. Here, we hypothesized that by using 70% of lopinavir/ritonavir standard dose for maintenance therapy, virological efficacy would be maintained and dyslipidemia reduced, compared to using standard dose.

Materials & methods: We conducted a multicentre, randomised, open-label trial at 11 sites in Thailand. HIV-infected children aged <18 years weighing 25-50 kg and had HIV RNA (VL) < 50 copies/ml were randomly assigned by minimization scheme to FDA – recommended standard dose of lopinavir/ritonavir heat stable tablet or low dose (70% standard dose). LPV/r dosages for children 25-35 kg were 300/75 mg or 200/50 mg, children >35-50 kg were 400/100 mg or 300/75 mg twice daily. The primary endpoint was proportion of children with VL < 50 copies/ml at week 48. Secondary endpoints were lopinavir C_{trough} and dyslipidemia. (ClinicalTrials.gov number, NCT01307124)

Findings: From June to December 2011, 200 children, with mean (SD) age of 13.1 (2.5) years, and CD4 of 818 (312) cells/mm^3 were randomly assigned to standard (n=99) or low dose arm (n=101). The NRTI backbone were zidovudine/ lamivudine (47%), zidovudine/ didanosine (17%), tenofovir/ lamivudine (16%) and others (20%). By intention to treat analysis, proportions of children with VL < 50 copies/ml at week 48 were 91.8% and 88.1%, difference -3.7% (95% CI; -12.0% to 4.6%). By per protocol analysis, proportions of children with VL < 50 copies/ml at week 48 were 93.7% and 91.8%, difference -1.9%(95% CI; -9.4 % to 5.5%). Mean (SD) lopinavir C_{trough} were 7.1(3.7) and 5.2(2.4) mg/dl, respectively. Fourteen (7.3%) had C_{trough} < 1 mg/dl (4 in standard and 10 in low dose arms, p = 0.1). More children in the standard arm had cholesterol > 200 mg/dl (34.4% vs. 20.6%, p=0.03) and triglyceride > 150 mg/dl (60.4% vs. 44.3%, p =0.03) than those in the low dose arm.

Conclusion: This study demonstrated noninferiority in virological efficacy of low dose compared to standard dose lopinavir/ritonavir tablet as maintenance therapy. Dyslipidemia was less with low dose. This dosing regimen conferred adequate LPV blood level with reduce drug cost and potential long term complications.

No conflict of interest

Abstract: O_05

Treatment of pediatric HIV infection

Efficacy, Safety, and Adherence of TDF/3TC/EFV Once Daily in Virologic-suppressed HIV-infected Children following Switching from NNRTI-based Regimens

L. Aurpibul[1], T. Narkbunnam[2], V. Sirisanthana[1], O. Wittawatmongkol[2], W. Phongsamart[2], T. Sudjaritruk[3], T.R. Cressey[4], K. Chokephaibulkit[2]

[1]Chiang Mai University, Research Institute for Health Sciences, Chiang Mai, Thailand; [2]Mahidol University, Faculty of Medicine Siriraj Hospital, Bangkok, Thailand; [3]Chiang Mai University, Faculty of Medicine, Chiang Mai, Thailand; [4]Chiang Mai University, Faculty of Associated Medical Sciences, Chiang Mai, Thailand

Background: Simplifying antiretroviral treatment(ART) regimen is desirable in HIV-infected children and adolescents. In resource-limited setting, the combination of tenofovir(TDF), lamivudine(3TC) plus efavirenz(EFV) is the most affordable first line once-daily regimen. Our objective was to determine the efficacy, safety, and adherence of this regimen in children.

Materials & Methods: A 48-week prospective, single arm, open label, multi-center study. HIV-infected children receiving a NNRTI-based regimen without TDF, aged between 3-18 years, weighing ≥15 kg, and HIV RNA level < 50 copies/mL, were enrolled. At entry, the ART regimen was changed to a once daily TDF/3TC/EFV. HIV RNA level and CD4 lymphocyte count were measured at 0, 24, and 48 weeks. Clinical events, routine lab testing, estimated glomerular filtration rate (eGFR), fractional excretion (FE) of calcium and phosphorus, and bone mineral density (BMD) were monitored. Adherence was evaluated using pills count and self-reported. Quality of life was measured by mini QOL questionnaire(scores ranged from 1 [feeling very bad] to 10 [feeling very good]). Forty HIV-infected age and CD4-matched children who were receiving ARTwithout TDF were also enrolled as a control group for comparison of renal function and bone mineral density.

Results: Forty children were enrolled: 17(34%) were male, median age was 12.4 years(range 3.1-17.7). The ART regimen prior to switching were AZT/3TC/nevirapine in 23(58%), and AZT/3TC/EFV in 17(42%); mean duration on ART prior to enrollment was 354(SD 155) weeks. At week 48, 39 of 40(97.5%) remained virologic-suppressed(HIV RNA level < 50 copies/mL). Mean CD4 at baseline and week 48 was similar (857 vs. 784 cells/uL, p=0.106). During the 48-week follow-up, 34 clinical events occurred in 23 children. None were classified as a serious adverse event or related to the study drugs. No renal events occurred. The eGRF decreased from 179(SD48) at baseline to 166(SD51) at week 48(p=0.021); while among the control group, eGFR decreased from 166(SD38) to 154(SD25), p=0.087). The FE of calcium increased from 0.26(SD0.23) at baseline to 0.50(SD0.49) at week 48, *p*=0.005; no change in FE of phosphorus. No abnormal urine sediment was observed. At baseline, 10(25%) children had low BMD z-score(< -1.5), three had a low vitamin D level. Five additional cases of low BMD were detected over 48 weeks; all five have normal vitamin D level. Among the control group, six cases had low BMD z-score at baseline (2 with low vitamin D), and 3 additional cases at week 48 (none had low vitamin D). After switching from AZT- to TDF-containing regimen, there was an increase in mean hemoglobin (from 12.7(SD1.4) to 13.3(SD1.5), (p<0.001), white blood cell count (from 6448 (SD1551) to 7202(SD1899). p=0.013), and absolute neutrophil count (from 3086(SD1456) to 3929(SD1515), p=0.004) at baseline and week 48, respectively. All had > 95% treatment adherence. The Mini Quality of Life Assessment showed increased scores for feeling about medication from 8.2(SD1.8) to 9.3(SD1.0) at baseline and week48, respectively (p<0.001).

Conclusions: Switching to TDF/3TC/EFV in HIV-infected children was safe and effective. This simplified regimen may improve adherence but close monitoring BMD and renal function should be performed.

No conflict of interest

Abstract: O_06

HIV infection and adolescents

Prevalence of Depression amongst HIV Infected Adolescents in Malawi

A.C. Mazenga[1], M.H. Kim[2], A. Devendra[1], S. Ahmed[2], C. Sharp[3], J.K. Mhango[1], M. Bvumbwe[1], M. Machika[1], W. Kamuyango[1], A. Munthali[1], P.N. Kazembe[1]

[1]Baylor College of Medicine - Abbott Fund Children's Clinical Centre of Excellence, Clinic, Lilongwe, Malawi; [2]Baylor College of Medicine International Pediatric AIDS Initiative Texas Children's Hospital, Department of Virology, Houston, USA; [3]University of Houston, Department of Psychology, Houston, USA

Background: Depression is the most commonly occurring psychiatric disorder among people living with HIV and AIDS (PLWHA). Children and adolescents are particularly vulnerable to depression with estimates of prevalence as high as 28% in this population. Most studies on depression in youth come from high-income countries, with a scarcity of data regarding depression coming from the epicenter of the HIV pandemic - Southern Africa. The objective of our study was to determine the prevalence of depression among HIV infected adolescents aged 12 to 18 years in Malawi.

Materials & Methods: A cross-sectional design with a descriptive quantitative approach was used. HIV-infected adolescents presenting for routine care at Antiretroviral treatment (ART) clinics in Central and Southern Malawi were invited to participate in the study. Two depression screening instruments were used - Beck's Depression Inventory-II (BDI-II) and Children's Depression Inventory-2- short (CDI-2 Short). A clinical interview using the Children's Depression Rating Scale-Revised (CDRS-R) was used to confirm the diagnosis of depression. Chi-Square tests were used to compare the categories of depression between males and females.

Results: Out of the targeted 700 participants, 80% (562) completed the questionnaires. Of these, 93.1% (523) were on ART. Their mean age was 14.5 years. Using the BDI-II (cut-off of 17), 25.6% (144) were determined to be depressed, with 15.2% (85) rated to have moderate to severe depression. Suicidal symptoms were expressed in 7.2% (40) of participants with 1.1% (6) expressing severe suicidal symptoms. Using the CDI**,** 25.6% (144) were determined to be depressed. Finally, using clinical assessment with the CDRS-R, 18.9% (106) were determined to be depressed.

Conclusion: This study demonstrates a high prevalence of depression among HIV-infected adolescents in Malawi, comparable to the findings of other prevalence studies done in other settings. Additional research investigating factors associated with depression are needed in order to inform the development of effective interventions.

No conflict of interest

Abstract: O_07

HIV infection and adolescents

Naive CD4 T lymphocytes and recent thymic emigrants, 15 or more years after perinatal HIV infection: the ANRS-EP38-IMMIP study

S. Blanche[1], D. Scott-Algara[2], J. Le Chenadec[3], C. Didier[4], T. Montange[5], V. Avettand-Fenoel[6], C. Rouzioux[6], J.P. Viard[7], C. Dollfus[8], N. Bouallag[3], J. Warszawski[3], F. Buseyne[5]

[1]AP-HP Hôpital Necker-Enfants malades, Unité Immunologie et Hématologie Pédiatrique, Paris, France; [2]Institut Pasteur, URIR-Virology department, Paris, France; [3]CESP INSERM, U1018, Le Kremlin-Bicêtre, France; [4]Institut Pasteur, URIR-Virology Department, Paris, France; [5]Institut Pasteur, UEPVO-Virology Department, Paris, France; [6]AP-HP Hôpital Necker-Enfants malades, Laboratoire de Virologie, Paris, France; [7]AP-HP Hôpital de l'Hôtel-Dieu, Centre de Diagnostic et de Thérapeutique, Paris, France; [8]AP-HP Hôpital Trousseau, Service d'Hématologie et d'Oncologie Pédiatrique, Paris, France

Background: Naive T lymphocyte restoration is essential for the maintenance of a diverse TCR repertoire. Children infected during the perinatal period are now reaching adulthood. Their thymic activity and their peripheral naive CD4 T lympocytes levels have been poorly described during and after adolescence. Here, we studied naive ($CD4_N$) and recent thymic emigrant ($CD4_{RTE}$) CD4 T lymphocytes and their correlates in perinatally infected youths over the age of 15.

Materials & methods: The ANRS-EP38-IMMIP study included 93 perinatally HIV-infected youths between the ages of 15 and 24 years; 43% were male, 39% were of black ethnicity, 85% were on HAART and 65% had an undetectable plasma viral load (pVL). Flow cytometry was used for the phenotypic study of lymphocytes. $CD4_N$ levels were defined as the percentage of CD4 T lymphocytes that were $CD45RA^+CD62L^+$; $CD4_{RTE}$ levels were calculated as the percentage of $CD4_N$ T lymphocytes that were $CD31^+$. Coreceptor usage was determined by sequencing the *env* gene. Mann-Whitney and Spearman tests were used for univariate analyses. Multivariate analyses were performed by linear regression, with $CD4_N$ and $CD4_{RTE}$ percentages as continuous dependent variables.

Results: Median (IQR) $CD4_N$ and $CD4_{RTE}$ percentages were 56% (44-64) and 79% (74-83), respectively. Patients with undetectable pVL tend to have lower $CD4_N$ percentages (55% and 58%, p=0.10), and significantly lower $CD4_{RTE}$ percentages (77% and 81%, p=0.003) than patients with detectable pVL. In patients with suppressed viral replication, $CD4_N$ percentages were positively correlated with cumulative HIV-RNA loads over the last 10 years (rho=0.339, p=0.01), and were higher in patients harbouring X4R5 viruses than in those harbouring R5 viruses (61% and 44%, respectively; p=0.001). Both $CD4_N$ and $CD4_{RTE}$ percentages were positively correlated with current CD4 T cell count ($CD4_N$: rho=0.460, p=0.0005; $CD4_{RTE}$: rho=0.569, p=0.0002). Multivariate analysis confirmed these associations.

Conclusion: After at least 15 years of HIV infection, perinatally infected youths had preserved levels of naive CD4 T lymphocytes that positively correlate with both current and past levels of HIV replication. The persistence of an elevated thymic activity that could compensate the deleterious effect of HIV replication is remarkable.

No conflict of interest

Abstract: O_08

HIV infection and adolescents

Poor retention of HIV-positive adolescents and youth enrolled in care and on treatment in Kenya

E. Koech[1], C. Wang[1], C.A. Teasdale[1], T. Alwar[1], D. Chege[1], R. Fayorsey[1], M. Hawken[1], E.J. Abrams[1]

[1]ICAP, Columbia University, New York, USA

Background: In recent years the number of adolescents (10-19 years) living with HIV has increased substantially in resource limited settings in part due to improved survival of peri-natally HIV-infected children. There are also large numbers of adolescents newly acquiring HIV infection. Youth (15-24 years) are increasingly recognized as drivers of the HIV epidemic in sub-Saharan Africa with 45% of all new infections occurring in this age group. Care for HIV-positive adolescents and youth presents unique challenges with regard to addressing their changing physical, emotional and psychosocial needs and these factors may hinder their retention in medical care.

Materials & methods: We examined routinely collected patient-level data from patients aged 10-24 years enrolled from 2006 to 2011 at 35 health facilities in Kenya. All facilities received support from ICAP-Columbia University through PEPFAR and are part of the Identifying Optimal Models for Care in Africa study. Loss to follow-up (LTF) was defined as not attending a clinic visit for more than 12 months for patients prior to antiretroviral therapy (ART) initiation (pre-ART) and 6 months for patients on ART. Kaplan-Meier estimates were used to calculate rates of LTF and death with log rank tests used to examine differences by age group.

Results: A total of 10,574 patients 10-24 years were enrolled in care; 13.5% were 10-14 years, 17.2% were 15-19 years and 69.4% were 20-24 years at enrollment. Eighty-one percent were female and the most common point of entry into care was VCT (34%). At enrollment, the median CD4+ cell count for all patients was 342 [interquartile range (IQR): 155-569]; the median CD4+ count at enrollment for 10-14 year olds was 290 [IQR: 111-517] compared to 347 [IQR: 159-569] for 20-24 year olds (p<0.0001). At 12 months after enrollment, rates of LTF and death were 44.7% (95% CI: 43.7-45.7%) and 2.2% (95% CI: 1.9-2.5%), respectively. For those who initiated ART, overall LTF at 12 months after starting treatment was 23.4% (95% CI: 21.9-24.8%) and death was 1.9% (95% CI: 1.4-2.3%). LTF on ART differed by age groups; at 12 months LTF was 12.6% (95% CI: 10.2-15.1%) in 10-14 year olds, 22.7% (95% CI: 19.1-26.2%) in 15-19 year olds and 27.2% (95% CI: 25.3-29.0%) in 20-24 year olds (p<0.001).

Conclusions: Retention of HIV-positive adolescents and youth in this large Kenyan cohort was poor. LTF appeared to be higher in older youth aged 20-24 years of age. Further research is needed to identify the factors associated with LTF as well as specific interventions to improve retention and health outcomes in this vulnerable age group.

No conflict of interest

Abstract: O_09

Late Breaker

Mother-to-child transmission of HIV continues to decline in the UK and Ireland

C.L Townsend[1], L. Byrne[1], C. Thorne[1], M. Cortina-Borja[1], C. S Peckham[1], P. A Tookey[1]

[1]MRC Centre of Epidemiology for Child Health, UCL Institute of Child Health, London, UK

Background: In 2000-2006, the rate of mother-to-child HIV transmission (MTCT) among diagnosed women in the United Kingdom and Ireland was 1.2%. Since then, the population of HIV-positive pregnant women has changed, with an increasing number of repeat pregnancies being reported. Here we report MTCT rates in 2007-2011.

Methods: Pregnancies in women with diagnosed HIV across the UK and Ireland are reported through the National Study of HIV in Pregnancy and Childhood. Live singleton infants born 2000-2011 with HIV infection status reported by March 2013 were included. Analyses were carried out in Stata v12, and generalized additive models were fitted in R 2.14.2 to analyse the association between duration of cART and probability of MTCT.

Results: There were 12487 singleton live births to HIV-positive women between 2000 and 2011. Among 6377 births in 2007-2011, 72% (4613) were to women diagnosed before pregnancy (vs 46% in 2000-2006, p<0.001). Overall 96% of women (6045/6279) received combination antiretroviral therapy (cART) in pregnancy in 2007-2011, 39% of whom (2371/6036) had initiated treatment prior to conception (vs 20% in 2000-2006, *p*<0.001). Women initiated cART significantly earlier in 2007-2011 (median 22.7 weeks gestation) than in 2000-2006 (median 25.7 weeks, *p*<0.001), and the proportion of women receiving no antenatal antiretrovirals declined from 3.3% (194/5922) in 2000-2006 to 0.9% (59/6279) in 2007-2011 (*p*<0.001). 31% of deliveries in 2007-2011 were planned vaginal (1955/6363, vs 14% in 2000-2006, *p*<0.001).
The overall MTCT rate was 0.57% in 2007-2011 (33/5788, 95% CI: 0.42-0.84%), significantly lower than in 2000-2006 (1.24%, *p*<0.001), and reached 0.46% in 2010-2011. After excluding infants known to have been breastfed and/or with clear evidence of postnatal HIV acquisition, MTCT rates in 2007-2011 in women on cART were: 0.17% (3/1720) in those with planned vaginal delivery, and 0.59% (12/2050) with elective caesarean section; 0.19% (6/3217) in women on cART at conception; and 0.05% (2/3915) in those with undetectable viral load in pregnancy (median 23 days before delivery, IQR 10, 39). Neither of the two transmissions occurring despite cART and undetectable viral load were likely in utero transmissions (both infants had negative tests at birth).
The probability of MTCT by cART duration was modelled in 6507 women with data on timing of initiation of antenatal cART (2000-2011). MTCT probability declined rapidly with each additional week of cART, reaching 1% at ~10 weeks of cART and levelling off at 0.5% after ~15 weeks of cART.

Conclusions: MTCT rates in the UK and Ireland continued to improve in recent years, reaching 0.46% in 2010, despite an already successful prevention programme. This was primarily due to a reduction in transmissions associated with late initiation or non-receipt of cART in pregnancy, as well as an increase in the proportion of women on cART at conception.

No conflict of interest

Abstract: O_10

Late Breaker

Roll-out of Universal Antiretroviral Therapy for HIV Infected Pregnant and Breastfeeding Women ("Option B+") in Malawi: Factors Influencing Retention in Care

L. Tenthani[1,2,3], A. D Haas[2], H. Tweya[2,4,5], A. Jahn[1,3], J. J van Oosterhout[6], F. Chimbwandira[1], Z. Chirwa[1,3], W. Ng'ambi[4], A. Bakali[7], S. Phiri[4], L. Myer[8], F. Valeri[2], M. Zwahlen[2], G. Wandeler[2,9], O. Keiser[2] for the Ministry of Health in Malawi and IeDEA Southern Africa*

[1] Department of HIV and AIDS, Ministry of Health, Lilongwe, Malawi; [2] Institute of Social and Preventive Medicine, University of Bern, Switzerland; [3] International Training and Education Centre for Health / Department for Global Health, University of Washington, Seattle, USA; [4] Lighthouse Trust Clinic, Lilongwe, Malawi; [5] The International Union Against Tuberculosis and Lung Disease, Paris, France; [6] Dignitas International, Zomba, Malawi; [7] Baobab Trust, Lilongwe, Malawi; [8] Centre for Infectious Disease Epidemiology and Research, School of Public Health & Family Medicine, University of Cape Town, South Africa; [9] Department of Infectious Diseases, University Hospital Bern, Switzerland

Background: Malawi introduced the "Option B+" strategy to prevent mother-to-child transmission of HIV, starting all pregnant and breastfeeding women on lifelong antiretroviral therapy (ART) in 2011.

Methods: In this cohort study we analysed country-wide facility- and patient-level data from sites enrolled in the national electronic ART register. We explored site- and patient-level factors of loss to follow-up (LTF) by meta-analyses, logistic regression and competing risk survival models.

Results: A total of 21 939 women from 540 sites (in facility-level data) and 28 428 women from 19 ART sites with electronic medical record system (EMRS) (in patient-level data) were included. Seventeen percent of all Option B+ patients were LTF six months after ART initiation. LTF varied considerably across sites from 0 to 58%. Thirty-seven percent of the sites performed well with less than 10% of all patients LTF six months after ART initiation. Thirty-three percent of the sites had LTF >20%. LTF was higher in urban sites, in larger sites with EMRS, in sites operated by the Ministry of Health, and in central hospitals. In larger sites with EMRS, Option B+ patients who started ART while pregnant were five times more likely to fail to return to the clinics after the initial visit than patients who started ART for their own health (OR 5·2, 95% CI 4·4-6·2). Option B+ patients who started treatment while breastfeeding, were twice as likely to miss their first follow-up visit (OR 2·3, 95% CI 1·8-2·8) *(Figure 1)*. Pregnant Option B+ patients who started ART on the same day they tested HIV+ were less likely to return to clinics than pregnant Option B+ patients who started later (OR 1·7, 95% CI 1·4-2·2).

Conclusions: Retention was good at many sites but LTF varied widely. Further investigation should increase our understanding of Option B+ patient LTF early on ART.

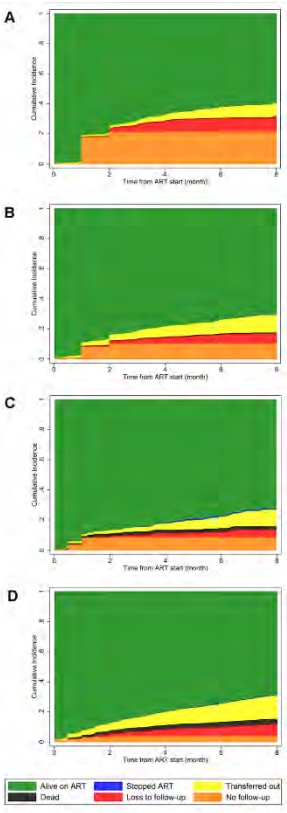

Figure 1: Cumulative incidence of outcomes on antiretroviral therapy (ART) since the introduction of Option B+. *Cumulative incidence of treatment outcomes plotted over time from the start of antiretroviral therapy (ART) in months. Treatment outcomes are compared across four groups based on patients' indication for ART: Option B+ indication and ART start during pregnancy (A), Option B+ indication and ART start after delivery while breastfeeding (B), WHO stage 3 or 4 and/or CD4<350/µL and pregnant at ART start (C), and WHO stage 3 or 4 and/or CD4<350/µL and not pregnant at ART start (D). Estimates are derived from competing risk regression.*

Abstract: O_11

Comprehensive Pediatric HIV care

In Utero HAART Exposure Associated with Decreased Growth among HIV-Exposed Uninfected Breast Fed Infants in Botswana

K. Powis[1,2,3], L. Smeaton[4], W. Fawzi[5], A. Ogwu[3], E. Machakaire[3], S. Souda[3], K. Wirth[6], J. Makhema[3], S. Lockman[2,3,7], M. Essex[2,3], R. Shapiro[2,3,8]

[1]Massachusetts General Hospital, Departments of Medicine and Pediatrics, Boston, USA; [2]Harvard School of Public Health, Department of Immunology and Infectious Diseases, Boston, USA; [3]Botswana-Harvard School of Public Health AIDS Partnership Institute, Gaborone, Botswana; [4]Harvard School of Public Health, Department of Biostatistics, Boston, USA
[5]Harvard School of Public Health, Department of Global Health and Population, Boston, USA; [6]Harvard School of Public Health, Department of Epidemiology, Boston, USA; [7]Brigham and Women's Hospital, Infectious Disease Unit, Boston, USA; [8]Beth Israel Deaconess Medical Center, Infectious Diseases Department, Boston, USA

Background: Lower birth weights have been reported among HIV-exposed uninfected infants exposed in utero to highly active antiretroviral therapy (HAART) as compared to zidovudine (ZDV) alone. The longer term growth impact of in utero antiretroviral exposure has not been well studied in HIV-exposed uninfected children.

Materials & methods: The Mashi and Mma Bana studies enrolled HIV-infected pregnant women from the same 4 sites in Botswana. Infant weight and length were routinely measured through 24 months-of-life. This analysis includes singleton infants born Ž 37 weeks' gestation to mothers receiving HAART or ZDV for Ž 2 weeks before delivery, breast fed from birth (for up to 6 months, per protocols), HIV-negative through 18-24 months and for whom weight/length measurements were obtained at 24 months-of-life. Infants remained AZT- (direct ingestion) of HAART-exposed (through breastfeeding) throughout breastfeeding. Weight-for-age (WAZ), length-for-age (LAZ), and weight-for-length (WLZ) z-scores were derived from WHO Child Growth Standards. WAZ, LAZ and WLZ were compared by antiretroviral (ARV) exposure group at 24 months (t-test and linear regression).

Results: 821 infants (305 AZT-exposed from Mashi, 516 HAART-exposed from Mashi [23 infants] and Mma Bana [493]) were included in this analysis. Median enrollment CD4 counts were 392 in AZT-treated and 324 in HAART-treated mothers (p<0.001); median duration of in utero exposure to AZT or HAART was 5.7 weeks (range 2.0-10.9 weeks) and 12.0 weeks (range 2.4-22.9 weeks), respectively (p<0.001); and median months breastfed was 5.9 and 6.0, respectively (p=0.39). At 24 months, mean WAZ and LAZ were significantly lower in HAART exposed infants (WAZ -0.51 vs -0.28;p=0.002)(LAZ -1.00 vs -0.71; p=0.001) in unadjusted analysis, while mean WLZ did not vary significantly (WLZ -0.02 vs +0.09; p=0.19). After adjusting for maternal CD4, viral load, enrollment site, in utero ARV exposure duration and maternal BMI on month postpartum, in utero HAART exposure remained significantly associated with lower mean WAZ (p<0.001) and LAZ (p<0.001).

Conclusions: At 2 years-of-life, mean weight and length z-scores of infants with in utero HAART exposure were significantly lower than AZT-exposed infants in unadjusted and adjusted analyses. These findings may have long-term impact on morbidity and mortality for infants exposed to HAART in utero who remain HIV-negative.

No conflict of interest

Abstract: O_12A

Treatment of pediatric HIV infection

HIV Drug Resistance in children less than 18 months of age and newly diagnosed with HIV: 2011 Surveillance in Swaziland

M. Penazzato[1], E. Martin[2], M. Jordan[3], V.J. Okello[4], C. Azi[4], D. Sibandze[5], N. Mthethwa[4], B. Gama[6], K. Samson[6], J. Perriens[7], S. Bertagnolio[7]

[1]Medical Research Council CTU, Clinical Trial Unit, London, United Kingdom; [2]2Kilimanjaro Christian Medical University College Moshi, Clinical Trial Unit, Kilimanjaro, Tanzania; [3]Tufts Medical Center, Division of Geographic Medicine and Infectious Diseases, Boston, USA; [4]Ministry of Health Swaziland, Swaziland National HIV/AIDS Programme, Mbabane, Swaziland; [5]Ministry of Health Swaziland, National Clinical Laboratory, Mbabane, Swaziland; [6]World Health Organization, Swaziland Country Office, Mbabane, Swaziland; [7]World Health Organization, HIV Department, Geneva, Switzerland

Background: Selection of non-nucleoside reverse transcriptase inhibitors (NNRTI) resistant mutations, which potentially compromises response to NNRTI-based ART, is well documented in children exposed to interventions to prevent mother-to-child-transmission (PMTCT). Data on the overall prevalence of NNRTI resistance in those unexposed to PMTCT is limited. To provide insights into selection of first-line ART for these children, Swaziland implemented HIV drug-resistance (HIVDR) surveillance in children <18 months using WHO recommended-methods.

Materials & methods: A nationally representative sample of dried blood spots, collected between February and June 2011, was obtained through early infant diagnosis PCR testing and subsequently genotyped. Stanford algorithm was used for interpretation of HIVDR mutations. Demographics and ARV exposures were abstracted from laboratory requisition forms . Analysis was unlinked and anonymous. Predictors of HIVDR were investigated using logistic regression (STATA12-software).

Results: Specimens from 201 children (45.3% female), median age 4 months (IQR 2-8), were analyzed. NRTI and NNRTI resistance was detected in 3.5% and 31.8% of cases, respectively. Prevalence of NNRTI resistance was 9% in children reporting no previous exposure to PMTCT or neonatal-prophylaxis and 14% among children with unknown exposure.
In adjusted analysis, prevalence of NNRTI resistance decreased with age (p<0.01) and increased with exposure to neonatal prophylaxis (OR=5.78,95%CI=0.98-34.31,p=0.05), in particular among children receiving NVP-containing neonatal prophylaxis (sdNVP+7 days AZT: OR=6.29,95%CI=1.35-29.41,p=0.02; Extended (during breastfeeding): OR=22.92,95%CI=4.69-112.37,p<0.01). In the subset exposed to PMTCT, use of option-A and ART for mothers' health was associated to a 3.82 (95%CI=1.34-10.87,p=0.01) and 10.33 (95%CI=2.28-46.86,p<0.01) fold increase in NNRTI resistance, respectively.

Conclusions: First, NNRTI resistance is observed among children with no or unknown history of PMTCT, suggesting that current record systems to capture history of PMTCT exposure does not fully identify young children with NNRTI resistance and that tracking mechanisms to ascertain PMTCT exposure should be strengthened. Second, rates of NNRTI resistance are likely to be high if infection is acquired while mothers are receiving ART. Our data suggest that consideration should be given to start lopinavir/ritonavir based regimens regardless of PMTCT-exposure, particularly in the context of expansion of triple ART for PMTCT. Surveillance of HIVDR remains critical to monitor the impact of scaling-up PMTCT strategies and inform future policy change.

No conflict of interest

Abstract: O_12B

Implementation research on PMTCT and pediatric treatment programs

World Health Organization HIV Drug Resistance surveillance in children less than 18 months newly diagnosed with HIV in Zimbabwe

T. Apollo[1], S. Zinyowera[1], J. Dzangare[1], C. Chakanyuka[2], O. Mugurungi[1], M. Penazzato[3], E. Martin[4], M. Jordan[5], J. Perriens[6], S. Bertagnolio[6]

[1]Ministry of Health & Child Welfare, HIV Department, Harare, Zimbabwe; [2]World Health Organisation, Country Office, Harare, Zimbabwe; [3]Medical Research Council CTU, Clinical Trial Unit, London, United Kingdom; [4]Kilimanjaro Christian Medical University College Moshi, Department of Statistics, Kilimanjaro, Tanzania; [5]Tufts Medical Center, Division of Geographic Medicine and Infectious Diseases, Boston, USA; [6]World Health Organisation, HIV Department, Geneva, Switzerland

Background: Widespread use of non-nucleoside reverse transcriptase inhibitors (NNRTI) for prevention of mother-to-child transmission (PMTCT) reduces HIV transmission but increases the risk of selecting for NNRTI resistant mutations, thus potentially compromising response to NNRTI-based ART in young children. History of NNRTI exposure is used to identify children who should initiate lopinavir/ritonavir (LPV/r)-based ART. However, overall prevalence of NNRTI resistance in those unexposed to PMTCT is unknown. WHO's protocol for surveillance of HIV drug-resistance (HIVDR) among HIV-infected children <18 months offers a unique opportunity to inform optimal selection of first-line ART in young children.

Materials & methods: As part of pilot testing, a nationally representative sample of 250 dried blood spots remnant from early infant diagnosis PCR testing were genotyped. Specimens were consecutively selected from July to September 2012. Stanford algorithm was used for interpretation of drug resistant mutations. Demographic information and PMTCT exposure were abstracted from laboratory requisition forms. Analysis was unlinked and anonymous. Risk factors for drug-resistance were explored using logistic regression (STATA12-software).

Results: Specimens from 232 children (51.7% male, median age 4 months (IQR 1-9) were collected from 163 health facilities across 50 districts. NRTI and NNRTI resistance was detected in 12.5% and 62.5% of cases, respectively. In children reporting no previous exposure to PMTCT or neonatal-prophylaxis, prevalence of NNRTI resistance was 23% and 50% among children with unknown exposure.
In multivariable analysis, prevalence of NNRTI resistance decreased with age (p<0.01) and increased with exposure to PMTCT (OR=3.12,95%CI=1.48-6.58,p<0.01) and neonatal prophylaxis (OR=2.78,95%CI=1.29-6.02,p=0.01). Exposure to sdNVP, option-A and ART for mothers' health was associated, respectively, with 5.03 (95%CI=1.34-18.87,p=0.02), 4.12 (95%CI=1.99-8.53,p<0.01) and 5.97 (95%CI=2.31-15.43,p<0.01) fold increase in NNRTI resistance. Association between NNRTI resistance and neonatal prophylaxis with NVP was stronger (6 weeks: OR=6.83, 95%CI=1.99-23.41, p<0.01; Extended: OR=5.59, 95%CI=2.75 11.37, p<0.01).

Conclusions: Surveillance of HIVDR in Zimbabwe suggests that history of PMTCT exposure is an inaccurate criterion to identify children at high risk of failing NVP-based regimens. Our data suggest that in young children LPV/r-based regimen should be considered for first-line therapy, regardless of PMTCT-exposure, particularly in countries with high prevalence of NNRTI resistance such as Zimbabwe. Surveillance of HIV drug resistance remains critical to monitor the impact of scaling-up PMTCT strategies.

No conflict of interest

Abstract: O_13

Prevention of Mother-to-Child transmission

Elimination of new paediatric HIV infections: assessment of maternal and paediatric antiretroviral coverage in priority countries

O.O. Adetokunboh[1], M. Oluwasaanu[2], M. Oguntoye[3]

[1]Stellenbosch University, Division of Community Medicine, Cape Town, South Africa; [2]University of Ibadan, Faculty of Public Health, Ibadan, Nigeria; [3]Ministry of Health, Epidemiology Department, Ilorin, Nigeria

Background: In the bid to eliminate new HIV infection among children and keep the mothers healthy, the Global Plan was developed. The plan set to reduce new paediatric HIV infections by at least 85% and 50% reduction in the number of HIV-associated pregnancy-related death by the end of 2015. There is a particular focus on the 22 countries with the highest estimated numbers of pregnant women and children living with HIV. One of the prong of the plan framework is to ensure pregnant women have access to the antiretroviral drugs needed to prevent HIV infection from being passed on to their babies during pregnancy, delivery and breastfeeding. However, there is need to estimate trends and levels of progress among the priority countries few years before the idea was conveiced and up to the time of launching of Global Plan in 2011.

Methods: Using various HIV surveillance data, the trends in the percentage of HIV infected pregnant women who received antiretroviral drugs to reduce the risk for mother-to-child transmission in twenty priority countries were analysed. The 2004 – 2008 data were the mid - point estimates of Millennium Development Goals database (updated 2012) . The 2009 – 2011 data came from the Joint United Nations Programme on HIV/AIDS (2012). Also analysed was the percentage coverage of antiretroviral therapy among children younger than 15 years old (2010 -2011).

Results: From 2004 to 2011, the estimated coverage of HIV infected pregnant women who received antiretroviral drugs to reduce the risk for mother-to-child transmission in these twenty priority countries increases with varying degree. Likewise the average coverage increases on yearly basis, from 17 % to 60 %. Notably Botswana before 2009 has already >92% coverage of antiretroviral regimens among pregnant women. The Global Plan average maternal antiretroviral coverage baseline was 35% in 2009 (95% confidence interval [CI] 25% to 45%) and it progressed to 60% (95% CI 47% to 72%) in 2011. Zimbabwe recorded the most significant increase of 67% while Angola recorded a decline of 3%. The South African maternal antiretroviral coverage was well >95% in 2011. The difference between the Southern and Eastern African Regions Global Plan maternal antiretroviral coverage and Western and Eastern African Regions was 4.4% (p= 0.6193). Four of the priority countries were still below 25% while six had moved beyond the 75% benchmark. The percentage coverage of antiretroviral therapy among children younger than 15 years old increased by 7% between 2010 and 2011. Botswana had the highest coverage of 89% while Chad was the lowest with 8% among the children. India and Congo Democratic Republic status could not be verified.

Conclusions: There was an appreciable progress in terms of the maternal and children antiretroviral coverage from the baseline period to the launching of Global Plan in 2011. There was also no significant difference in the success recorded among the Sub Saharan African regions. However there is still need for more innovative approach among some of the countries still lagging behind.

No conflict of interest

Abstract: O_14

Prevention of Mother-to-Child transmission

Vaginal delivery as option for HIV infected women: decreasing late preterm delivery rates in a European cohort collaboration

K. Aebi-Popp[1], F. Mulcahy[1], C. Rudin[2], B. Bertisch[3], T. Glass[4], C. Grawe[5], B. Martinez de Tejada[6], K. Scheibner[7], M. Rickenbach[8], I. Hoesli[9], C. Thorne[10]

[1]St. James s Hospital, GUIDE Clinic, Dublin, Ireland; [2]University Children`s Hospital, Nephrology, Basel, Switzerland; [3]Cantonal Hospital, Infectious Diseases, St. Gallen, Switzerland; [4]Troical Institute, Statistics, Basel, Switzerland; [5]University Hospital, Obstetrics and Gynaecology, Zuerich, Switzerland; [6]University Hospital, Obstetrics and Gynaecology, Geneva, Switzerland [7]University Hospital, Obstetrics and Gynaecology, Bern, Switzerland; [8]University Hospital, SHCS Data Center, Lausanne, Switzerland; [9]University Hospital, Obstetrics and Gynaecology, Basel, Switzerland; [10]MRC Centre of Epidemiology for Child Health, UCL Institute of Child Health, London, United Kingdom

Background: Several studies have noted that preterm delivery (PTD), a major cause of perinatal morbidity and mortality, is more frequent in HIV positive women. There exist conflicting reports about the association between PTD, HIV infection and combination antiretroviral therapy (cART). Here, we evaluate trends in PTD rates, with a focus on whether late PTD rates (34-36 completed gestational weeks) have decreased since vaginal delivery was recommended for HIV positive women with suppressed viral load (VL).

Materials & methods: A pooled analysis of data on HIV-1 positive women enrolled in the Swiss Mother & Child HIV Cohort Study and the European Collaborative Study with a live birth between 2000 and 2010 was carried out. Deliveries were classified as occurring pre or post publication of national guidelines recommending vaginal delivery in women with low/ undetectable VL and PTD rates calculated.

Results: Overall, 2663 mothers and 3013 deliveries were included from 10 countries. 41% of women were white and 49% black; median age was 31 years at the time of delivery. Overall, in 7% of pregnancies no antenatal ART was received; among the 2169 pregnancies with data on timing of ART, 30% of women conceived on cART and 70% started during pregnancy (78% in the 1st or 2nd trimester and 22% in the 3rd trimester). The proportion of vaginal deliveries increased from 17% (414/2402) before the change in guidelines to 52% (313/611) after; elective CS rates decreased from 65% to 27% accordingly. Overall, the PTD rate was 21% (611/2953). We observed a decrease of late preterm deliveries from 16% (377/2354) before to 7% (42/599) after the change of guidelines (χ^2 =6.26, p<0.001).

Conclusions: This finding substantiates the suggestion that in the period when elective CS was recommended for all HIV-positive women, some late PTD were due to elective CS before 37 weeks due to concerns regarding HIV transmission after rupture of membranes or labour. The late PTD rates in HIV positive women are likely to continue to decline as increasing proportions of women with undetectable VL deliver vaginally.

No conflict of interest

Abstract: O_15

Co-infections in HIV-infected children

Progressive liver disease in patients with vertically-acquired HIV/HCV co-infection in Spain

C. Abad[1], C. Fortuny[2], P. Almendros[1], P. Soler[3], M. Navarro[4], A. Noguera-Julian[2], M. González-Tomé[1], M. Espiau[3], J. Tomás Ramos[5], P. Rojo[1]

[1]Hospital 12 de Octubre, Department of Pediatrics, Madrid, Spain; [2]Hospital Sant Joan de Déu, Department of Pediatrics, Barcelona, Spain; [3]Hospital Vall d'Hebron, Department of Pediatrics, Barcelona, Spain; [4]Hospital Gregorio Marañón, Department of Pediatrics, Madrid, Spain; [5]Hospital de Getafe, Department of Pediatrics, Madrid, Spain

Background: Little data exist regarding the clinical course of patients with vertically-acquired HIV/HCV co-infection. We aim to describe the clinical evolution and the diagnostic and therapeutic management of these patients in Spain.

Materials & methods: A cross-sectional study was performed to describe vertically-acquired HIV/HCV co-infected children, included in the Spanish Paediatric HIV Cohort (CoRISpe). Data collected included the clinical evolution, diagnostic procedures and treatment.

Results: Forty-six patients were included, of whom 52% are currently being followed-up in Paediatric Units. The median age at the last visit was 18.2 years (IQR 16.2-20); 54% were female. All were born in Spain, and 96% were Caucasian. 35% have been diagnosed of AIDS and 93% received HAART. The median nadir CD4 count was 360 /mm3 (IQR 164-617). The median CD4 count/percentage at the last visit was 716 /mm3 (IQR 440-912)/32% (IQR 26-38). 63% had undetectable HIV viral load at the last visit. HCV genotypes were: 50% genotype 1, 2% genotype 2, 15% genotype 3 and 28% genotype 4; unknown genotype in 4%. 43% had increased alanine aminotransferase (ALT > 40 U / L). 13% were seronegative for HCV antibodies. Liver biopsy and Fibroscan had been performed in 11 (24%) and 32 (70%) patients, respectively, at a median age of 15.2 years (IQR 14.2-18). Advanced fibrosis in any of these diagnostic test, defined as Metavir F3-F4 in biopsy and/or >9.4 kPa in FibroScan, was observed in 11 of 36 patients (30%). No association was found between clinical or analytic factors and advanced liver fibrosis. Twelve patients (28%) were treated for HCV infection (ribavirin+ pegylated interferon); virological response was sustained in only 3 of them. One child died after one month of liver transplantation because of lactic acidosis combined with HCV reinfection in the liver.

Conclusions: One third of vertically HIC/HCV co-infected patients in Spain suffer from progressive liver disease at adolescence or young adulthood. A significant proportion of patients are HCV seronegative. The response to standard treatment for HCV infection is poor.

No conflict of interest

Abstract: O_16

Prevention of Mother-to-Child transmission

Thailand National Program for Early Infant HIV Diagnosis: Six-year Experience using Real-time DNA PCR on Dried Blood Spots

W. Sirirungsi[1], T. Samleerat[1], N. Ngo-Giang-Huong[2], I. Collins[3], W. Khamduang[3], B.D. Caritey[3], S. Le Coeur[4], A. Pusamang[5], P. Leechanachai[1]

[1]Chiang Mai University Faculty of Associated Medical Sciences, Medical Technology Department, Chiang Mai, Thailand; [2]Institut de Recherche pour le Développement (IRD) and Chiang Mai University Faculty of Associated Medical Sciences, UMI174 and Medical Technology Department, Chiang Mai, Thailand; [3]Institut de Recherche pour le Développement (IRD), UMI174, Chiang Mai, Thailand; [4]Institut National Etudes Demographiques (INED) and Chiang Mai University Faculty of Associated Medical Sciences, Medical Technology Department, Chiang Mai, Thailand; [5]National Health Security Office, HIV/AIDS and Tuberculosis Program, Bangkok, Thailand

Background: From 2007, under Thailand National Program for early infant HIV diagnosis (EID), the Clinical Microbiology Service Unit (CMSU), Faculty of Associated Medical Sciences, Chiang Mai University, has provided nationwide free EID for infants born to HIV-infected mothers with the support of the National Health Security Office (NHSO). Samples were collected using Dried Blood Spots (DBS) and transported by standard postal mail, which enables access for hospitals in rural and remote settings. We report here the uptake and outcome results of this service.

Material & methods: Samples were tested for HIV-DNA using a validated In-house real-time DNA-PCR assay on DBS and quality controlled by the US-CDC. According to the Thai guidelines, testing was recommended at 2 months of age. Confirmation testing was requested as soon as possible if the first sample was positive, and at 4 months of age if negative. Results were reported electronically through a secured website dedicated for this service as part of the NHSO reporting system. Access to the website was restricted to authorized HIV care team using passwords.

Results: Between April 2007 and December 2012, the CMSU received 12,678 DBS samples drawn from 7,143 infants at 344 hospitals throughout Thailand. Uptake has increased over time, from 338 samples in 2007 to 3,119 samples in 2012. Median time between blood collections to reception at CMSU was 7 days including 5 days for transportation of samples. Once received, samples were tested on ongoing basis. Results were available electronically within 1 week for 57% and 2 weeks for 32% of samples. The median age at first test was 64 days and at second test was 128 days. Overall, 5,535 infants (77.5%) had confirmed DNA PCR results, of which 173 (3.1%) were confirmed HIV-positive and 5,362 (96.9%) were confirmed HIV-negative. Among 1,608 infants with unconfirmed DNA PCR results, 84 had unconfirmed positive result and 1,524 had unconfirmed negative result. If we considered the infants who had unconfirmed positive test as infected, and those with unconfirmed negative test as uninfected, the overall transmission rate was 3.6%. The transmission rate was highest in 2008 (6.3%) and decreased to 2.8% in 2012. Of the 257 infants considered as HIV-infected; 234 (91.0%) were eligible for free antiretroviral therapy (ART) under universal coverage under the NHSO and 171 of 234 (73.0%) infants registered for follow-up of HIV care. Overall, 25 HIV infected infants had died prior to ART and 146 of 234 (62.4%) initiated combination ART. The median time between confirmed positive result and ART initiation was 3 months.

Conclusions: Since its inception, uptake of EID service has been increased all over Thailand. The average rate of perinatal HIV transmission was low at 3.6%. However, despite the generalized provision of early diagnosis, only 56.8% (146 of 257) of HIV-infected infants were known to have initiated ART although the HIV treatment guidelines for children recommend immediate initiation of ART after diagnosis.

No conflict of interest

Abstract: O_17

Comprehensive Pediatric HIV care

Follow up of HIV infected infants identified in early infant diagnosis program in Francistown Botswana 2005-2012

C. Motswere-Chirwa[1], K. Legwaila[1], S. Matambo[1], M. Maruping[1], T. Kolobe[1], E. Machakaire[1], M. Glenshaw[1], A. Voetsch[1], L. Lu[2], C. Petlo[3], V. Letsholathebe[3]

[1]Centers for Disease Control and Prevention, Global AIDS Program/PMTCT, Gaborone, Botswana; [2]Centers for Disease Control and Prevention, Global AIDS Program/PMTCT, Atlanta, USA; [3]Ministry of Health, HIV/ AIDs Prevention and Care, Gaborone, Botswana

Background: In Botswana, high coverage of testing and antiretroviral prophylaxis have reduced mother to child transmission of HIV to <4%. To facilitate early linkage of HIV-exposed infants to antiretroviral therapy (ART), Botswana implemented a national Early Infant Diagnosis (EID) program in 2006. Dried blood spots from infants are tested for HIV by DNA polymerase chain reaction (PCR) at six weeks postpartum and six weeks after weaning if breastfed. Infants found to be HIV-positive are immediately referred for ART.

Materials & methods: From June 2005 to December 2012, we identified all HIV-positive infants tested by DNA PCR in thirteen health facilities in Francistown, the second largest city in Botswana. We reviewed clinic and hospital registers and databases to determine the following parameters for HIV-exposed infants that were tested in the EID program: EID results, receipt of EID results, clinical evaluation, ART initiation, mortality, and loss to follow up as of February 2013.

Results: Over the 7.5 year period, 10,270 infants were born to HIV-positive mothers. Of these HIV-exposed infants, 7,776 (76%) were tested at a mean age of 12 weeks; 202 (2.6%) infants were HIV-positive. Of these, 152 (75%) had results communicated to their families and 128 (63%) were clinically evaluated at an ARV clinic; 123 HIV-positive infants received antiretroviral therapy (61% of total; 96% of evaluated infants). There were 86 (43%) infants alive and on treatment as of February 2013; 78 (39%) had died at an average age of 2 months. Of the infants that died, 56 (28%) died before treatment initiation and 22 (11%) died while on treatment. A total of 24 (12%) infants were lost to follow up and 14 (7%) were either transferred or moved out of Francistown.

Conclusions: HIV-infected infants in Botswana are identified through EID enabling them to receive timely, life-saving HIV treatment. Despite tremendous successes in preventing mother to child transmission of HIV in Botswana, results of the EID program highlight the challenges of pediatric HIV diagnosis and treatment. Less than half of HIV-infected infants diagnosed by EID were located and found to be alive and receiving ART; one-third had died at an average age of 2 months. To ensure that HIV-infected children remain healthy, new approaches are needed to provide them with strong, timely linkages to HIV care and treatment and to document and follow their progress.

No conflict of interest

Abstract: O_18

Comprehensive Pediatric HIV care

Determinants of retention and mortality among HIV-infected children at ICAP-supported care and treatment facilities in Mozambique (2004-2011)

C.A. Teasdale[1], L. Apicella[1], M. Lahuerta[1], B. Thome[1], I. Yersin[1], L. Ahoua[1], H. Nuwagaba-Biribonwoha[1], E. Macassa[2], C. Wang[1], E.J. Abrams[1]

[1]ICAP, Columbia University, New York, USA; [2]Ministry of Health, Mozambique, Maputo, Mozambique

Background: Pediatric HIV care and treatment services have been scaled-up in resource limited settings in recent years leading to better health outcomes for children with HIV. Retention of children prior to antiretroviral therapy (ART) initiation has been challenging for many programs and more information is needed on the factors associated with both loss to follow-up (LTF) and death in children enrolled in HIV care.

Materials & methods: We used routinely collected patient level data from the Optimal Models study to assess mortality and LTF in children aged 2-14 years enrolled in HIV care at 52 ICAP-supported facilities across Mozambique between January 2004 and June 2011. LTF was defined as no recorded clinic visit in the last 12 months for children before antiretroviral treatment (pre-ART) and 6 months for children on ART. For the pre-ART period, sub-distribution hazards models were constructed to estimate LTF and death accounting for competing risks. Kaplan-Meier and Cox proportional hazards models were used for ART patients.

Results: The analysis includes 8,696 children with a median age of 5years [interquartile range (IQR) 2-8]. One-year cumulative incidence of pre-ART LTF was 33.2% (95% CI 32.3-34.6%) and pre-ART death was 2.0% (95%CI 1.7-2.3%). Factors associated with pre-ART LTF included younger age (2-5years vs. >5 years), adjusted sub-distributional hazard ratio (aSHR) 1.23 (95%CI 1.12-1.36), severe malnutrition, aSHR 1.45 (95%CI 1.25-1.69), and enrolling at a district hospital compared to a primary health clinic, aSHR 1.65 (95%CI 1.23-2.22). Advanced WHO stage (IV vs. I) was associated with lower pre-ART LTF, aSHR 0.45 (95%CI 0.32-0.63), as was severe immunodeficiency, aSHR 0.72 (95%CI 0.56-0.92). Pre-ART mortality was higher among children with severe malnutrition, aSHR 2.78 (95%CI 1.67-4.63), and those enrolling at a district hospital, aSHR 3.05 (95%CI 1.75-5.32). Overall, 4,376 (50.3%) children initiated ART at a median age of 5.7 years [IQR 3.2-8.7]. Kaplan-Meier estimates of LTF and death at 1 year after ART initiation were 19.2% (95%CI 18.0-20.5%) and 4.2% (95%CI 3.6-4.9%), respectively. LTF in children on ART was associated with severe malnutrition at ART initiation, adjusted hazard ratio (aHR) 1.51 (95%CI 1.15-1.97), and severe immunodeficiency, aHR 1.41 (95%CI 1.17-1.71). Children on ART who enrolled at secondary level health facilities had lower LTF compared to those enrolled at primary clinics, aHR 0.73 (95%CI 0.54-0.96). Mortality in children on ART was associated with malnutrition at ART initiation, both moderate, aHR 2.00 (95%CI 1.12-3.56), and severe, aHR 2.55 (95%CI 1.42-4.57). Mortality in children on ART was also associated with severe immunodeficiency, aHR 1.56 (95%CI 1.02-2.36), and enrolling at a district hospital, aHR 2.05 (95%CI 1.10-3.82).

Conclusions: High rates of LTF in the pre-ART period were observed in this cohort of children 2-14 years enrolled in HIV care in Mozambique. It is likely that the low pre-ART mortality observed resulted from the high rates of LTF prior to ART initiation. Retention was higher among children on ART suggesting that initiating ART may be protective against LTF. Greater efforts are needed to rapidly initiate children onto treatment and to retain children in care prior to the start of ART.

No conflict of interest

Abstract: O_19

Treatment of pediatric HIV infection

When to start ART in children aged 2-5 years? Causal modeling analysis of IeDEA Southern Africa

M. Schomaker[1], M. Egger[2], J. Ndirangu[3], S. Phiri[4], H. Moultrie[5], K. Technau[6], V. Cox[7], J. Giddy[8], C. Chimbete[9], R. Wood[10], C. Bolton-Moore[11], H. Rabie[12], B. Eley[13], L. Muhe[14], M. Penazzato[14,15], S. Essajee[16], O. Keiser[2], A.-M. Davies[1], for the IeDEA Southern Africa -IeDEA-SA-Paediatric Collaboration

[1]University of Cape Town, School of Public Health and Family Medicine, Cape Town, South Africa; [2]University of Bern, Institute of Social and Preventive Medicine, Bern, Switzerland; [3]University of KwaZulu-Natal, Africa Centre for Health and Population Studies, Somkhele, South Africa; [4]Kamuzu Central Hospital, Lighthouse Trust Clinic, Lilongwe, Malawi; [5]University of Witwatersrand, Wits Reproductive Health and HIV Institute, Johannesburg, South Africa; [6]Rahima Moosa Mother and Child Hospital, Wits Reproductive Health and HIV Institute, Johannesburg, South Africa; [7]Médecins Sans Frontières, Khayelitsha ART Programme, Cape Town, South Africa; [8]McCord Hospital, Sinikithemba Clinic, Durban, South Africa; [9]Newlands Clinic, Newlands Clinic, Harare, Zimbabwe; [10]University of Cape Town, Gugulethu Community Health Centre and Desmond Tutu HIV Centre, Cape Town, South Africa; [11]Centre for Infectious Disease Research in Zambia, Centre for Infectious Disease Research in Zambia, Lusaka, Zambia; [12]University of Stellenbosch, Tygerberg Academic Hospital, Stellenbosch, South Africa; [13]University of Cape Town, Red Cross Children's Hospital and School of Child and Adolescent Health, Cape Town, South Africa; [14]World Health Organization, Department of Maternal and Child Health, Geneva, Switzerland; [15]Clinical Trial Unit, Medical Research Council, London, United Kingdom; [16]Clinton Health Access Initiative, Boston, USA

Background: Evidence to inform decisions on when to start antiretroviral therapy (ART) in children 2-5 years of age is very limited. While the PREDICT trial showed that for children aged 1-12 years there was no difference in mortality between the immediate (start irrespective of CD4/clinical criteria) and deferred (initiate treatment when CD4 drops to <15% or child has CDC Stage C event) treatment arms, the trial included only a small number of children aged <5 years, limiting applicability to younger children. We conducted a causal modeling analysis using the IeDEA-SA collaborative dataset to estimate mortality when starting ART irrespective of clinical-immunological condition compared to deferring until meeting particular CD4 thresholds (e.g. 750 cells/mm^3 or 25%).

Materials & methods: ART-naïve children aged 24-59 months at first visit who enrolled in 8 HIV care sites in 3 countries (South Africa, Zimbabwe & Malawi), with ≥1 visit prior to ART initiation and ≥1 follow-up visit were included in the analysis. We estimated mortality over 3 years for ART initiation at different CD4 thresholds using g-computation, adjusting for measured time-dependent confounding of CD4%, CD4 count and weight-for-age z-score, with 95% bootstrap confidence intervals (95%CI). We used multiple imputation to account for missing baseline and follow-up co-variates.

Results: The median (IQR) age at first visit of the 2,934 included children (51% male) was 3.3 years (2.6-4.1) with median (IQR) CD4 count of 592 cells/mm^3 (356-895) and CD4% of 16% (10-23). Median (IQR) follow-up duration was 928 (314-1082) days. The estimated cumulative mortality after 3 years for ART initiation at different CD4 thresholds was as follows:

No ART: 3.4% (95% CI 2.1-6.5%)
CD4 <250 cells/mm^3 or 15%: 2.5% (95%CI: 1.6-4.1%)
CD4 <500 cells/mm^3 or 20%: 2.3% (95%CI: 1.4-3.5%)
CD4 <750 cells/mm^3 or 25%: 2.2% (95%CI: 1.4-3.5%)
ART irrespective of CD4 value: 2.1% (95%CI 1.3-3.5%)

There was a trend to higher mortality associated with initiating ART at lower CD4 values or not initiating ART at all. There was no significant mortality difference between initiating ART irrespective of CD4 values and ART initiation according to the WHO 2010 guidelines threshold of 750 cells/mm^3 or 25%.

Conclusion: The results indicate higher mortality associated with initiating ART at lower CD4 values, but no significant mortality benefit from initiating ART irrespective of CD4 in comparison to deferring to the threshold of 750 cells/mm^3 or 25%. These results do not assess whether there is a benefit of earlier ART initiation in terms of morbidity, neurodevelopmental or immunological outcomes.

No conflict of interest

5th International Workshop on HIV Pediatrics

28 – 29 June 2013, Kuala Lumpur, Malaysia

Abstracts

Poster presentations

Abstract: P_01

Treatment of pediatric HIV infection

Association of SCLO1B1 polymorphism and plasma concentration of lopinavir in HIV-infected children

P. Udomchaisakul[1], C. Srichomthong[2], N. Thammajaruk[3], S. Tongkobpetch[4], P. Sornchai[5], J. Wongsawat[6], J. Sophonphan[7], J. Intasan[8], K. Suphapeetiporn[2], T. Puthanakit[9]

[1]Faculty of Medicine Chulalongkorn University, Pediatrics, Bangkok, Thailand; [2]Center of Excellence for Medical Genetics Faculty of Medicine Chulalongkorn University and Excellence Center for Medical Genetics King Chulalongkorn Memorial Hospital Thai Red Cross, Pediatrics, Bangkok, Thailand; [3]HIV Netherlands Australia Thailand Research Collab, Laboratory, Bangkok, Thailand; [4]Center of Excellence for Medical Genetics Faculty of Medicine Chulalongkorn University, Pediatrics, Bangkok, Thailand; [5]Nakornping Hospital, Pediatrics, Chiang Mai, Thailand; [6]Bamrasnaradura Infectious Disease Institute, Pediatrics, Nonthaburi, Thailand; [7]HIV Netherlands Australia Thailand Research Collab, Biostatistics, Bangkok, Thailand; [8]HIV Netherlands Australia Thailand Research Collab, Clinical Research Associate, Bangkok, Thailand; [9]HIV-NAT the Thai Red Cross AIDS Research Centre and Faculty of Medicine Chulalongkorn University, Pediatrics, Bangkok, Thailand

Background: Organic anion transporting polypeptides (OATP), which are coded by the solute carrier organic ion transporter (*SLCO*) genes were reported to involve in lopinavir/ritonavir (LPV/r) drug metabolism. This study was aimed to investigate the associations between *SLCO1B1* single nucleotide polymorphisms (463 Cà A and 521 Tà C) and LPV plasma level among HIV-infected Thai children.

Materials & methods: The study included 196 HIV-infected Thai children receiving LPV/r containing antiretroviral therapy (ART) and 297 HIV-negative blood donors as a control group. This is a substudy of a randomized study comparing low dose versus standard dose lopinavir/ritonavir among HIV-infected children with virological suppression LPV/r dosage for children in standard dose and low dose arms per body weight band were 25-35 kg; 300/75 mg or 200/50 mg, >35-50 kg; 400/100 mg or 300/75 mg twice daily. Genotype of *SLCO1B1* 463 Cà A and 521 TàC polymorphisms was performed by allelic discrimination using real-time polymerase chain reaction. Lopinavir trough concentration(Ctrough) were measured by a validated high performance liquid chromatography method. The association between polymorphisms and LPV Ctrough was analyzed by Mann-Whitney test.

Results: The mean (SD) age of HIV-infected children and control were 13.1(2.5) and 37.0(10.6) years, respectively. For *SLCO1B1* 463C?A, all HIV-infected cases and 295 control were homozygous for C/C, 2 controls (0.7%) were heterozygous for C/T. For *SLCO1B1* 521 Tà C polymorphism, the frequency of TT, TC, and CC genotype in HIV-infected children and control were 0.75,0.23, 0.02 and 0.79,0.19,0.02 respectively. The median LPV Ctrough among children receiving LPV/r standard dose were 7.8, 8.7, and 11.3 mg/ml for TT, TC and CC polymorphism (p-value TT vs CC = 0.043).The mean LPV Ctrough among children LPV/r low dose were 5.1, 5.8,and 5.0 mg/ml respectively (p-value >0.05).

Conclusions: There is a trend towards higher LPV Ctrough among children with CC genotype, however only 2% of children had CC genotype. The *SLCO1B1* polymorphism does not play an important role in interperson variation of LPV blood level.

No conflict of interest

Abstract: P_02

Treatment of pediatric HIV infection

Evaluation of a comprehensive strategy to measure pediatric adherence to antiretroviral therapy in Kenya

R. Vreeman[1], W.M. Nyandiko[2], H. Liu[3], W. Tu[3], J.E. Slaven[3], S.O. Ayaya[2], M. Scanlon[4], T.S. Inui[5]

[1]Indiana University, Pediatrics, Indianapolis, USA; [2]Moi University, Child Health and Paediatrics, Eldoret, Kenya; [3]Indiana University, Biostatistics, Indianapolis, USA;

[4]Indiana University, Children's Health Services Research, In, USA; [5]Indiana University, Medicine, In, USA

Background: For children in resource-limited care settings, no well-validated measures of antiretroviral therapy (ART) adherence exist. Our objective was to develop reliable, valid questionnaire items to assess ART adherence among children in Kenya.

Materials & Methods: A comprehensive battery of potentially useful adherence measurement items was created by literature review, formative qualitative work, expert panel consultation, and cognitive interviewing of patients and caregivers. We conducted 6 monthly evaluations of the validity of questionnaire items among caregivers of HIV-infected Kenyan patients ages 0-13 years, using medication event monitoring systems (MEMS) as external criteria for medication adherence. A logistic regression model with the Least Absolute Shrinkage and Selection Operator (LASSO) penalty was used to select items best correlating with MEMS adherence (dichotomized by ≥90% MEMS adherence at visit vs. <90%.) Items selected at least twice across 6 visits were used to calculate risk scores validated by MEMS with the sum of items weighted by regression coefficients. C-statistics were reported for each visit using selected items.

Results: Among 200 children (median age 8.45 years), median adherence was 92.5% (IQR 82.5, 97.5%) by MEMS. 51.8% had ≥90% MEMS adherence at the first month's assessment; 29.4% had ≥90% adherence by MEMS over the 6 months. In LASSO analyses, 9 items had non-zero slopes and were significantly associated with dichotomized MEMS adherence, including: 'problems keeping time with medicines,' 'being enrolled in AMPATH's nutrition program,' 'problems with child taking the medicines,' 'number of doses missed in last 30 days,' 'taking extra doses,' 'having days when child missed at least one dose,' and 'days when child took dose more than 1 hour late.' The sums of 15 items from the domain of child-level factors and 18 from the domain of caregiver-level factors were also significantly associated with MEMS adherence. C-statistics for the risk score calculated from the nine LASSO-selected variables ranged from 0.61-0.78 across the visits.

Conclusions: We identified ART adherence measurement items with validity in identifying HIV-infected children with poor adherence and potential causes for non-adherence. Upon further validation, this set of measurement items will provide an important tool for pediatric ART monitoring.

No conflict of interest

Abstract: P_03

Treatment of pediatric HIV infection

Treatment outcomes in HIV infected children in Kenya, 2004-2011: Results from a National Retrospective Cohort Study

I. Mukui[1], A. Katana[2], I. Inwani[3], B. Ng'eno[2], A. Gichangi[2], A. Waruru[2], A. Mwangi[1], J. Wamicwe[1], M. Kimani[1], S. Modi[4], L. Nganga[2]

[1]Ministry of Health, National AIDS & STI Control Program, Nairobi, Kenya; [2]US Centers for Disease Control and Prevention (CDC), Division of Global HIV/AIDS (DGHA), Nairobi, Kenya; [3]University of Nairobi, Pediatrics, Nairobi, Kenya; [4]US Centers for Disease Control and Prevention (CDC), Division of Global HIV/AIDS (DGHA), Atlanta GA, USA

Background: There are limited data on clinical and immunological outcomes of national public sector scale-up of pediatric HIV care and treatment in sub-Saharan Africa. We assessed the treatment outcomes and predictors of mortality for children in the Kenyan national HIV program.

Materials & methods: We conducted a retrospective cohort study of HIV infected patients aged <15 years enrolled into HIV care in 50 randomly selected Kenyan health-facilities from November 1, 2004 to March 31, 2010. We abstracted data from medical records for all children aged <2 years and 89 randomly selected children aged ≥2years. We computed median values with IQR to describe clinical characteristics and immunologic parameters, survival analysis using Kaplan-

Meier and fitted Cox proportional hazards models for predictors of mortality.

Results: We identified 7,727 children (50.8% female); 3214 aged < 2years. Median follow-up time was 2.4 (IQR 0.6-4.2) years. Of the 5706 (73.8%) with documented entry-point, more were identified through diagnostic testing (3413, 59.8%) than HIV exposed infant (HEI) follow-up (948, 16.6%), p<0.0001. At enrolment into HIV care, median age was 2.6 (IQR 1.1-6.4) years; CD4 was 16% (IQR 10-24); weight-for-age z-score (WAZ) was -1.8 (IQR -3.3 to -0.7); and 37.8% were classified as WHO stage III/ IV. Overall, 4,459 (64.7%) initiated ART after enrolment at a median age of 3.3 (IQR 1.6-7.2) years. At the end of the study period, 5,712(73.9%) were still in HIV care; median CD4 was 27.0 % (17.9-34.6) and WAZ was -1.6 (IQR -3.0 to -0.6); 1168 (15.1%) had transferred out of the study facilities, 441(5.7%) were lost to follow-up and 406 (5.3%) had died [mortality rate 55.2/100 child-years (95%CI 46.0, 66.2)].Survival probability at 12 months after initiation of treatment was 95.6%. Age < 1 year at enrolment (p<0.0001), WAZ <-2 (p=0.02), WHO stage III/IV (p<0.0001) and CD4< 5% (p=0.001) were associated with increased risk of death.

Conclusion: One-year survival and long-term retention for children enrolled in HIV care in this public sector program was high. However, the low proportion of children identified through HEI follow-up indicates a missed opportunity that could be addressed for early identification of HIV-infected infants and further reduction of mortality.

No conflict of interest

Abstract: P_04

Treatment of pediatric HIV infection

Paediatric antiretroviral treatment (ART): Health care worker perspectives contributing to the WHO 2013 consolidated guidelines development

M. Penazzato[1], L.J. Nelson[2], J. Ellis[2], S. Essajee[3], A. Nardone[2], A. Baller[2], N. Shaffer[2], M. Doherty[2], L.M. Muhe[2]

[1]Medical Research Council CTU, Clinical Trial Unit, London, United Kingdom; [2]World Health Organisation, HIV Department, Geneva, Switzerland; [3]Clinton Health Access Initiative, Clinical Support Team, New York, USA

Background: In 2013, the World Health Organization (WHO) will release consolidated ARV guidelines for low and middle-income countries. These guidelines will include revised recommendations on ART initiation and optimal first-line ART in children. Since 2007, WHO guidelines have been developed in accordance with the GRADE methodology. An assessment of healthcare workers (HCWs) values and preferences was performed as a critical step of the process.

Materials & methods: A cross-sectional e-survey was developed by WHO for clinicians providing paediatric ART to elicit HCWs perspectives on potential policy changes. The survey w as distributed widely via paediatric networks w orking in global health. Responses were collected over 3 weeks (November 2012). Quantitative data were analysed using Microsoft Excel 2010 and a thematic analysis was undertaken of free text responses.

Results: 348 HCWs responded to the survey. The majority (44.5%, 155/341) were from Southern Africa, East Africa (22.0%, 75/341), West or Central Africa (16.4%, 56/341) and Southeast Asia (7.0%, 24/341). Most respondents were pediatricians (37.9%, 128/338) or general physicians (29.3%, 99/338) and clinical officers (9.5%, 32/338) providing care to children for >2 years (87.7%, 292/333). 64% (194/303) thought that immediate ART should be recommended beyond infancy and the majority (67.7%, 153/226) indicated ≤5 years as the preferred option. Due to concerns around storage, palatability and lack of second line related to lopinavir, a nevirapine-based regimen was the most desirable option (56.6%, 15/279) for 1st line ART in children ≤3 years without history of exposure to NNRTIs. How ever, 35.1% (98/279) favorably view ed a recommendation with lopinavir-based regimen for this group. 47.3% (123/260) of respondents felt comfortable in prescribing tenofovir-based regimens in children >3 years, but many expressed concerns regarding the potential for TDF-toxicity and the need for monitoring

85.8%, 224/261. Finally, treatment monitoring with viral load testing w as preferred over CD4 count testing in 84.2% of cases (219/260).

Conclusion: These responses highlight concerns related to the feasibility of lopinavir/ritonavir for all children < 3 years and the use and monitoring of TDF in children 3-12 years. Rollout of the new guidelines should address these concerns and offer strategies to safely prioritize the most effective interventions.

No conflict of interest

Abstract: P_05

Treatment of pediatric HIV infection

Pharmacokinetics and 24-weeks efficacy of once daily darunavir/ritonavir in virologic suppressed HIV-infected Thai children: a pilot study

K. Chokephaibulkit[1], S. Rungmaitree[1], K. Lapphra[1], T. Narkbunnam[1], W. Phongsamart[1], O. Wittawatmongkol[1], T.R. Cressey[2]

[1]Siriraj Hospital, Pediatric Infectious Diseases, Bangkok, Thailand; [2]Program for HIV Prevention and Treatment (IRD URI 174), Faculty of Associated Medical Sciences Chiang Mai University, Chiang Mai, Thailand

Background: Once-daily dosing of 800/100 mg darunavir/ritonavir (DRV/r) has been approved in ART-naïve adults, as well as in ARV-experienced patients who have no prior DRV-associated resistant mutations (DAM). We compared the pharmacokinetics (PK) of darunavir/ritonavir twice daily versus once daily in virologically suppressed, HIV-infected children, and assessed the virological outcome, at 24 weeks, in children receiving darunavir/ritonavir once daily as part of combination antiretroviral treatment.

Materials & methods: HIV-infected children who had an HIV-1 RNA viral load <400 copies/mL for at least 6 months while receiving a DRV/r twice daily, and no prior DAM were enrolled. Intensive steady-state 12-hour blood sampling for PK assessment was performed at enrolment. Immediately afterwards, the DRV/r was changed to once daily and intensive steady-state 24 h blood sampling repeated 2 weeks later. Twice daily DRV/r doses of 375/100, 450/100, and 600/100 mg were increased to once daily doses of 450/100, 600/100, and 900/100 mg, respectively.
DRV/r PK parameters were calculated using non-compartmental analysis. CD4 cell counts and HIV viral load (VL) were determined at baseline and at 12, 24, 36 and 48 weeks.

Results: Eight children, 5 males, median (range) age 16.0 (11.0-18.9) years, were enrolled. Median (IQR) CD4 cell count was 806 (705-988) cells/mm^3. Darunavir AUC_{0-24h} following twice-daily and once-daily dosing was 59.6 (38.5–139.4) and 51.5 (20.7–117.7) mcg.hr/mL, respectively. The 12 (C_{12h}) and 24-hour (C_{24h}) DRV post dose concentrations were 1.41 (0.45-3.95) and 0.7 (0.2-2.4) mg/L, respectively. At 24 weeks, one child had a VL of 1216 copies/mL, which decreased to 110 copies/mL at 36 week, and another child had a VL of 800 copies/mL - both reported missing some doses. No serious adverse event reported.

Conclusion: In this pilot study, darunavir exposure following once and twice daily was low compared to previously reported data in HIV-infected children; however, the majority of children remained virological controlled up to 24 weeks with once daily dosing.

No conflict of interest

Abstract: P_06

Treatment of pediatric HIV infection

Monitoring and outcomes of antiretroviral therapy in HIV infected children in Southern Africa: a model based analysis

L. Salazar Vizcaya[1], O. Keiser[1], A. Haas[1], N. Blaser[1], M. Davies[2], V. Cox[3], B. Eley[4], J. Giddy[5], H. Moultrie[6], H. Rabie[7], K. Technau[8], R. Wood[9], M. Egger[1], J. Estill[1]

[1]University of Bern, Institute of Social and Preventive Medicine, Bern, Switzerland; [2]University of Cape Town,

Centre for Infectious Disease Epidemiology & Research (CIDER) School of Public Health & Family Medicine, Cape Town, South Africa; [3]Médecins Sans Frontières, Khayelitsha ART Programme, Cape Town, South Africa; [4]University of Cape Town, Red Cross Children's Hospital, Cape Town, South Africa; [5]McCord Hospital, Department of Medicine, Durban, South Africa; [6]University of Witwatersrand, Wits Reproductive Health & HIV Institute, Johannesburg, South Africa; [7]University of Stellenbosch, Tygerberg Academic Hospital, Cape Town, South Africa; [8]Rahima Moosa Mother and Child Hospital, Empilweni Services and Research Unit, Johannesburg, South Africa; [9]University of Cape Town, Desmond Tutu HIV Centre, Cape Town, South Africa

Background: Despite the tremendous success of antiretroviral therapy (ART) in children, accurate diagnosis of treatment failure remains difficult in most resource-limited settings. Most low-income countries rely on immunological and clinical criteria to detect treatment failure, which correlate poorly with virological failure. This can result in missed treatment failures, unnecessary switches to second-line ART and increased mortality. We aimed to compare the outcomes of ART in children between CD4 and viral load monitoring.

Materials & Methods: We developed an individual-based mathematical model for disease progression in HIV positive children on ART. The model was built using the open source R package *gems*. We parameterised the model with data from 12,379 children aged <16 years in 7 South African ART cohorts, which are part of the IeDEA Southern Africa collaboration. We simulated hypothetical cohorts of 10,000 children and followed them for 5 years. We compared four scenarios: 6-monthly CD4 monitoring, 6- and 12- monthly viral load monitoring with a failure threshold of 1000 copies/ml and 6-monthly viral load monitoring with a failure threshold of 5000 copies/ml. We used the World Health Organization (WHO) criteria on absolute and percentage CD4 to define immunological failure. We compared mortality, necessary and unnecessary switches to second-line ART as well as missed treatment failures and stratified the analyses for children aged <5 and 5-16 years.

Results: Cumulative 5-year mortality for children aged <5 years at ART initiation was higher with CD4 monitoring (9.1%) and viral load monitoring with a threshold of 5000 copies/ml (8.8%) compared to viral load monitoring with a threshold of 1000 copies/ml 12-monthly (8.0%) or 6-monthly (7.6%). For children who started ART at age ≥5 years, mortality was approximately 6% with all monitoring strategies. The overall proportion of children switching to second-line therapy increased from 2% with CD4 monitoring to over 20% with viral load monitoring. The majority of children who switched with CD4 monitoring switched unnecessarily. With CD4 monitoring 91% and with viral load monitoring 8 to 17% of treatment failures were missed.

Conclusions: Viral load monitoring with a failure threshold of 1000 copies/ml improves the survival of children who start ART within the first 5 years of life compared to CD4 monitoring. No difference in mortality was found among older children, but we did not include indirect benefits of viral load monitoring such as improved adherence. Viral load monitoring increases the need of second-line ART considerably compared to CD4 monitoring. However, with CD4 monitoring most children who switch to second-line ART do not have virological treatment failure and are therefore switched unnecessarily, leading to an inefficient allocation of resources. Our results suggest that routine viral load monitoring can be an efficient intervention for infants and small children, but its potential benefit on adherence and resistance should be studied further, particularly in older children.

No conflict of interest

Abstract: P_07

Treatment of pediatric HIV infection

Modeling the Impact of a Proposed Newborn HIV Testing Program for Early Infant Diagnosis in Resource-Limited Settings

A. Chiu[1], S. Modi[1], E. Rivadeneira[1], E. Koumans[1]

[1]Centers for Disease Control and Prevention, Division of Global HIV/AIDS Maternal and Child Health Branch, Atlanta, USA

Background: Early antiretroviral therapy (ART) initiation in HIV-infected infants significantly improves survival, but is often delayed in resource-limited settings. Newborn HIV DNA PCR testing at the time of delivery and before discharge from a health facility may reduce the number of infants lost to follow up before routine 6 week HIV testing and decrease the time to treatment initiation. We modeled the benefit of adding newborn HIV testing to the current 6-week HIV testing algorithm

Material & Methods: We used Excel to model the number of diagnostic tests used and infants initiated on ART by 3 and 18 months of age among a theoretical cohort of 1,000,000 pregnant women. We assumed published averages from sub-Saharan Africa for maternal HIV prevalence (5.7%), facility births (42.9%), PMTCT utilization (59%), and varying mother-to-child-transmission rates based on PMTCT regimen (5%-40%). We modeled the treatment cascade with published times and rates from sub-Saharan Africa for return of test results (52%; median lab turnaround time=1 month), enrollment in HIV care (40%), and ART initiation (49%; median time to initiation from enrollment=2.5 months). One-way sensitivity analysis was performed varying rates of facility births, PMTCT coverage, infant HIV testing rates, and enrollment in care to find an ideal setting to maximize early initiation of ART.

Results: Overall, newborn testing increased the number of infants on ART by 157% at age 18 months. The greatest increase was seen in early ART initiations, with a 313% increase by age 3 months. Newborn testing utilized 179 DNA PCR tests per child initiating ART by 3 months, compared to 142 for 6-week testing. Sensitivity analysis showed that settings with high PMTCT coverage and low rates of 6-week testing had the highest relative increase in infants initiating ART by 3 months. If highly effective PMTCT coverage improved to 100%, the relative increase of infants on treatment by 3 and 18 months using newborn testing was 388% and 176%, respectively; both newborn and 6-week testing would use 149 tests per child on treatment by 3 months. In settings where 6-week testing rates were as low as 5%, newborn testing increased the relative number of infants on treatment by 3 months by 1378%; the increase by 18 months was 511%. The number of tests per infant on treatment by 3 months was 187 for newborn testing compared to 138 for 6-week testing only. Overall yield of infants diagnosed increased the most with increases in HIV prevalence and facility birth rates.

Conclusion: Newborn testing would not only increase the number of infants initiating ART overall, but would also increase the number of infants initiating before 3 months of age. Given the proven benefit of early ART initiation, this could significantly improve pediatric morbidity and mortality. While newborn testing would require additional diagnostic tests, the benefit of more children initiating ART earlier is enough that countries, and specifically those with high facility birth and PMTCT rates, should consider adding newborn testing to their infant HIV testing algorithm.

No conflict of interest

Abstract: P_08

Treatment of pediatric HIV infection

Prevalence and impact of transmitted drug resistance (TDR) on response to ART in Children

L. Wittkop[1], N. Ngo-Giang-Huong[2], on behalf of the EuroCoord-CHAIN-EPPICC project team

[1]ICenter of Epidemiology and Biostatistics (Inserm U-897), Bordeaux School of Public Health (ISPED), Bordeaux, France; [2]IRD UMI 174-PHPT/Chiang Mai university, Medical Technology, Chiang Mai, Thailand

Background: The objective of the joint EuroCoord-CHAIN-EPPICC project was to assess the prevalence of TDR mutations and their association with virological failure (VF) in the first year of ART in children.

Materials & methods: HIV infected ART naïve children aged less than 18 years, initiating therapy between 1998 and 2008 were included if having at least one genotypic test performed on a sample collected prior to ART initiation. Resistance mutations were identified with the WHO-TDR mutation list 2009, and virus susceptibility to initial drugs was predicted

using the Stanford algorithm v6.0.5. The occurrence of VF was compared in children infected with virus fully susceptible to treatment regardless of resistance mutations (no TDR, or TDR but susceptible=susceptible) and children with at least low-level resistance to ≥1 administered drug (TDR and resistant=resistant). Time to VF defined as the first of two consecutive viral load measurements >500 cps/mL after 6 months therapy was assessed by Cox proportional Hazards models. Included variables were gender, age, HIV RNA, CD4 cell counts, treatment year, viral subtype, previous AIDS diagnosis and children origin.

Results: Of 589 children included, 52% were female, 20%, 22%, 47% and 11% were aged <2, 2-5, 6-12 and 13-17 years, respectively. 87% were infected perinatally and 51% were of Asian origin. Prevalence of TDR was 9% (n=53). Baseline characteristics were not different between children harbouring a virus with TDR mutations and those infected with a wild type virus. Overall cumulative Kaplan-Meier estimate for VF at 12 months was 18% (95% CI: 15; 21). VF tend to be higher in children with resistant virus than in those with susceptible virus (P=0.1). In adjusted analysis the hazard ratio (HR) for VF (resistant vs. susceptible) was 1.2 (95% CI: 0.6; 2.6; P=0.62). Younger age was associated with a higher risk of VF (HR 0.86 per each additional year; 95% CI: 0.81; 0.92; P<10-4).

Conclusions: Prevalence of TDR in children was comparable to what is reported in adults. The fact that TDR was not associated with VF is probably due to lack of power. The effect of age may be related to 'fading' of NNRTI resistance mutations in children exposed to single-dose nevirapine.

No conflict of interest

Abstract: P_09

Treatment of pediatric HIV infection

Failure in HIV-1 infected children on second-line antiretroviral treatment in Thailand

R. Suaysod[1], N. Ngo-Giang-Huong[2], S. Chalermpantmetagul[3], T. Cressey[2], S. Piyaworawong[4], S. Hanpinitsak[5], S. Potchalongsin[6], S. Krikajornkitti[7], S. Na-Rajsima[8], P. Traisathit[9], G. Jourdain[10]

[1]Institut de Recherche pour le Developpement IRD UMI 174/ Chiang Mai University, Program for HIV Prevention and Treatment (PHPT)/ Bioinformatics Faculty of Science, Chiang Mai, Thailand; [2]Institut de Recherche pour le Developpement IRD UMI 174/ Chiang Mai University, Program for HIV Prevention and Treatment (PHPT)/ Faculty of Associated Medical Science, Chiang Mai, Thailand; [3]Institut de Recherche pour le Developpement IRD UMI 174, Program for HIV Prevention and Treatment (PHPT), Chiang Mai, Thailand; [4]Mae Chan Hospital, Clinical, Chiangrai, Thailand; [5]Regional Health Promotion Centre 6, Clinical, Khon Kaen, Thailand; [6]Nong Khai Hospital, Clinical, Nong Khai, Thailand; [7]Samutsakhon Hospital, Clinical, Samutsakhon, Thailand [8]Mahasarakam Hospital, Clinical, Mahasarakam, Thailand; [9]Institut de Recherche pour le Developpement IRD UMI 174/ Chiang Mai University, Program for HIV Prevention and Treatment (PHPT)/ Biostatistics and Applied Statistics Research Laboratory (BASRL) Department of Statistics, Chiang Mai, Thailand; [10]Institut de Recherche pour le Developpement IRD UMI 174/ Harvard School of Public Health, Program for HIV Prevention and Treatment (PHPT)/ Immunology and Infectious Diseases, Chiang Mai/ Boston, Thailand

Background: Third-line antiretroviral treatment (ART) options for HIV-infected children are limited in resource-poor settings. This study aims at evaluating the rate of virological failure among HIV-1 infected children failing Protease Inhibitor (PI)-based second-line ART and assessing the reasons for failure.

Materials & Methods: In the Program for HIV Prevention and Treatment (PHPT) multicenter cohort (NCT00433030), 87 HIV-infected children were switched to PI-based second-line between March 2004 and March 2010. Kaplan-Meier analysis was used to estimate the risk of failure (confirmed viral load >400 copies/mL after 6 months of second-line ART, death, or

switch to a third-line ART). Genotypic resistance testing was performed on samples for which drug levels were detected and drug resistance mutations identified based on Stanford HIV drug resistance database.

Results: Of 87 children switched to PI-based second-line ART, 44 (51%) were female. At time of switching to PI-based second-line ART, median viral load was 4.0 $\log_{10}$ copies/ml (IQR 3.6 to 4.7).Cumulative risk of failure at 5 years on second line ART was 53.9% (95% CI: 42.3 to 64.3%). Forty children experienced virological failure (median viral load at failure 4.4 $\log_{10}$ copies/ml (IQR 3.8 to 4.8). In 28 (70%) of these children, drug plasma levels were undetectable indicating poor adherence. Genotypic resistance testing could be performed for the 12 children with detectable plasma drug levels. Two children had no viral resistance mutation. Two children had DRM to PI (N88S only or with L90M), NNRTI (Y181C) and NRTI (M184V, D67N, K70R, T215FIST). Seven had DRM to NNRTI (mostly Y181C and K103N) and NRTI (mostly M184V and D67N) and one to NRTI (D67N) and PI (N88S).

Conclusions: The risk of failure in children on second-line ART was high and most of failures were related to poor adherence. Intensive adherence counseling and close monitoring are crucial to preserve the long term efficacy of second line ART. Genotyping testing is needed at the time of failure to determine the optimal third-line ART taking into account the drugs limitations in Thailand.

No conflict of interest

Abstract: P_10

Treatment of pediatric HIV infection

Will it matter when we start?- age at start of anti-retroviral therapy (ART) and reversal of stunting

R. Parchure[1], B. Miladinovic[2], T. Darak[1], P. Emmanuel[3], V. Kulkarni[1]

[1]Prayas Pune, Health Group, Pune, India; [2]University of South Florida, College of Medicine, Tampa, USA; [3]University of South Florida, Pediatrics, Tampa, USA

Background: India is home to more than 80000 children living with HIV (CLHIV). Delayed diagnosis and late linkage to care is common. Current treatment guidelines do not consider early growth failure as an indicator for starting ART in children older than 2 years. These children are likely to have moderate to severe growth failure by the time they initiate ART. This study seeks to understand growth patterns
of children on ART attending a private clinic in India.

Materials & Methods: This is a retrospective analysis of cohort of CLHIV attending Prayas clinic, Pune, India. WHO growth charts for children (0-18 years) were used to calculate height and weight z scores (HAZ, WAZ). Height and weight measurements nearest (within a span of +/- 30 days) to the start of ART and every 6 months thereafter were used. Catch up growth post ART was assessed using mixed method model. STATA 12 was used for statistical analysis.

Results: During 1998 to 2011, 466 children were enrolled (201 girls and 265 boys). A total 302 children were ever started on ART. The median age at entry to the clinic and ART initiation was 7 and 7.6 years respectively. Majority (98%) were perinatally infected. Majority were in advanced stage of disease at initiation of ART (64.6% in WHO clinical stage 3 or 4; 87.38% with severe/advanced immunodeficiency). Median WAZ and HAZ increased from baseline -2.43 to -1.67 ($p < 0.001$) and -2.52 to -2.23 ($p = 0.013$) respectively during 60 months of ART. Mixed model (adjusted for gender, WAZ/HAZ, clinical/immunodeficiency stage and age at start of ART) showed significant weight and height improvement with ART (coef=0.44, $p< 0.001$). Reversal of stunting lagged behind reversal of underweight. Age at start of ART influenced catch up growth in height ($p< 0.001$) and weight ($p=0.03$). There was minimal gain in height in children in whom ART was started after 5 years of age ($p = 0.187$).

Conclusion: Delays in diagnosis and ART initiation result in irreversible growth retardation among CLHIV. Whether ART started immediately after diagnosis (irrespective of clinical and immune stage)

would prevent growth failure in children needs further investigation.

No conflict of interest

Abstract: P_11

Treatment of pediatric HIV infection

Early severe HIV disease precedes early antiretroviral therapy:Are we too late?

S. Innes[1], E. Lazarus[2], K. Otwombe[2], A. Liberty[2], R. Germanus[2], A. Janse van Rensburg[1], N. Grobbelaar[3], T. Hurter[3], B. Eley[4], M. Cotton[1], A. Violari[2]

[1]Stellenbosch University and Tygerberg Children's Hospital, Children's Infectious Diseases Clinical Research Unit (KID-CRU), Cape Town, South Africa; [2]University of the Witwatersrand and Baragwanath Hospital, Perinatal HIV Research Unit (PHRU), Soweto, South Africa; [3]ANOVA Health Institute, Paarl, Western Cape, South Africa; [4]University of Cape Town, Red Cross War Memorial Children's Hospital, Cape Town, South Africa

Background: Early infant mortality due to HIV occurs early, with a peak at 8 weeks of age. This implies that antiretroviral therapy (ART) initiation by 3 months of age may be too late for a large proportion of infants.

Materials & methods: This retrospective cohort study assesses the degree of HIV disease progression before ART initiation by 3 months of age in a programmatic setting in South Africa. Electronic and manual data extraction from databases and antiretroviral registers in 20 public clinics in Cape Town, and electronic data extraction from a large centralized ART service at CH-Baragwanath Hospital in Soweto was performed. Records of all infants initiated on ART by 3 months of age between June 2007 and September 2010 were extracted. Demographics, pre-ART immunological and clinical stage were analyzed descriptively, by chi-square, two-sample t-test and Kaplan-Meier methods.

Results: 403 records were identified, 88 in Cape Town and 315 in Soweto. Median age at ART initiation was 8.4 (interquartile range [IQR]: 7.2–9.7) weeks. At ART initiation, 197 infants (49%) had advanced HIV disease (CD4% <25% or WHO clinical stage 3 or 4). Median ages at ART initiation by site were 10.3 (IQR: 8.2–11.9) weeks in Cape Town and 8.6 (IQR: 7.7–10.0) weeks in Soweto infants (p<0.0001). In Cape Town, 67 infants (76%) had advanced HIV disease at ART initiation, compared to 130 infants (41%) in Soweto (p<0.0001).

Conclusions: ART initiation by 3 months of age may not adequately prevent disease progression. New emphasis on early diagnosis and rapid initiation of ART in the first weeks of life is essential to further reduce infant mortality.

No conflict of interest

Abstract: P_12

Treatment of pediatric HIV infection

Paediatric antiretroviral market: an analysis of the prices and trends between 2003-2011 in developing countries

L. Sagaon-Teyssier[1], S.F. Lee[2], M. Lallemant[2], B. Dongmo Nguimfack[3], J.P. Moatti[4]

[1]UMR912 SESSTIM – ORS PACA, Environnements Systèmes de Santé et Maladies transmissibles (ESSEM), Marseille, France; [2]Drugs for Neglected Diseases initiative, Paediatric HIV, Geneva, Switzerland; [3]World Health Organisation, HIV, Geneva, Switzerland; [4]UMR912 SESSTIM – ORS PACA, Environnements Systèmes de Santé et Maladies transmissibles (ESSEM)., Marseille, France

Background: Of the 3.4 million children living with HIV/AIDS, more than 90% are in sub-Saharan Africa; only 28% of children in need of antiretroviral therapy (ART) are receiving it. There is growing evidence to support earlier initiation of ART, as well as a call to treat all children below five years of age, regardless of clinical and immunological status; the revised 2013 World Health Organization (WHO) guidelines are likely to reflect this. To address

the huge paediatric HIV treatment gap, it is crucial for policy makers, donors, national treatment programmes, civil society groups and communities living with HIV/AIDS to understand some of the key access issues surrounding paediatric ART, including the availability and prices of appropriate antiretroviral (ARV) formulations, such as fixed dose combinations (FDCs). This analysis was performed to better understand the factors influencing market dynamics of paediatric ARVs.

Materials & Methods: The 2003-2011 paediatric ARV donor-funded procurement database of the Global Price Reporting Mechanism (GPRM/WHO) was analysed. The dataset included 13,535 transactions from 117 developing countries. These corresponded to 32 formulations and were reported by 12 organisations representing 80% of the donor-funded paediatric market. Each transaction provided information on drug formulations, prices, quantities, suppliers and destination countries. Price per treatment per year (PTY) and quantity of treatment per year (QTY) were calculated using WHO dose recommendations for a 10kg child. Descriptive statistical analyses of PTY and QTY for each formulation were carried out in relation to formulation types (single, dual or triple FDCs), country economic classification (low-, lower-middle-, and upper-middle-income), geographic region, market segment (originator, generic), and manufacturer. Multivariate regression analyses were performed to explore the role of various explanatory variables on QTY and PTY, controlling for time and geographical location.

Results: Multivariate analyses showed that originator prices were, in average, 51% higher than generics ($p<0.001$), suggesting that price determinants for paediatric ARVs were different between these segments. Descriptive analyses showed that, while single ARVs were produced by originator and generic companies, dual and triple FDCs were exclusively produced by generic companies. Until 2005, the market was dominated by originator companies; recently, generic companies have taken over the market, by up to 89% in 2011. For each dual and triple FDCs, there are between one and two manufacturers, and three to four for single ARVs. Generally, the prices of FDCs have remained constant after the first year post-introduction. The top ARV formulation, AZT/3TC/NVP, is produced by a single manufacturer. In 2011, 172,860 AZT/3TC/NVP treatment-years were purchased, a 3-fold increase over 2010, but its price remained unchanged. In contrast, the concurrent increase in volumes of nevirapine suspension, produced by three manufacturers, was accompanied by a reduction in price.

Conclusions: Our analyses show that purchase volumes or number of manufacturers have little to no influence on paediatric ARV price trends. Given the small size and fragility of this market with few manufacturers and a wide range of formulations, the current treatment needs of HIV-infected children will only be met if the market is consolidated through evidence-based optimal regimens.

No conflict of interest

Abstract: P_13

Treatment of pediatric HIV infection

Virological outcome on dried blood spots testing of HIV-infected children routinely monitored with clinical and immunological criteria in Uganda

P. Costenaro[1], R. Lundin[1], M.R. Petrara[2], M. Penazzato[1], W. Massavon[1], S. Kizito[3], S. Nabachwa[3], M. Nannyonga[3], D. Bilardi[1], E. Morelli[1], A. Mazza[4], M. Zanchetta[2], C. Giaquinto[1], A. De Rossi[2]

[1]University of Padova, Department of Paediatrics, Padova, Italy; [2]University of Padova IOV-IRCCS, Department of Oncology and Surgical Sciences Unit of Viral Oncology AIDS Reference Center, Padova, Italy; [3]St. Raphael of St. Francis Nsambya Hospital, Nsambya Home Care Department, Kampala, Uganda; [4]Santa Chiara Hospital, Department of Paediatrics, Trento, Italy

Background: Access to combined antiretroviral therapy (cART) is rapidly increasing in low-middle income countries (LMIC) where viral load (VL) is often not available to monitor treatment response. Delays in detecting treatment failure can occur when using clinical and immunological criteria alone. The aim of this study was to describe immunological, clinical and virological treatment failure and to explore the accuracy of

clinical and immunological criteria in a paediatric HIV cohort.

Materials & methods: A cohort study was conducted among 949 children at Nsambya Home Care (NHC), St. Raphael of St. Francis Nsambya Hospital (Uganda). All children were evaluated with monthly clinical and adherence follow-up; CD4 testing was provided at baseline and every 6 months thereafter. Although VL was not routinely assessed, dried blood samples (DBS) were collected from a random sample of 204 (21.50%) children participating in a parallel study, of which 191 were tested for VL. DBS collected from children on cART for ≥24 weeks were included in analyses. DBS were stored at room temperature during transport, HIV-1 RNA was extracted from 100 µl of blood and quantified by real-time PCR using ROCHE COBAS TaqMan System with estimated limit of detection of <170 cp/ml. Treatment failure was defined using WHO 2010 criteria.

Results: At the time of specimen collection, 104 (M 51, F 53) of 191 children had been on cART for ≥24 months (median 34.19 months, IQR 32.87); median CD4 and CD4% were 412 (IQR 439) and 11.8% (IQR 10.1). Eleven (10.6%) children had VL<400 cp/ml at median of 46.23 months (IQR 25.07) after cART initiation, while VL of 400-5000 and >5000 cp/ml were detected in 65/104 (62.5%) and 28/104 (26.9%) children at median of 31.74 (IQR 30.29) and 35.19 (IQR 31.28) months after cART initiation, respectively.
In the program setting 13 (12.5%) children had treatment failure applying immunological and/or clinical criteria, one with immunological failure and 12 with clinical failure (6/12 without immunological failure and 6/12 without recorded CD4). Of those, 3 clinical failures had VL <1000 cp/ml, 6 had VL 1000-5000 cp/ml and 3 clinical and 1 immunological failures had VL >5000 cp/ml. At specimen collection 92.31% (96/104) were receiving NNRTI-based regimens (65.63% first-line), while 7.69% (8/104) were on PI-based regimens (62.5% first-line). Neither initial regimen (chi square p= 0.644 and 0.106 for 400 and 5000 cp/ml thresholds) nor cART regimen at DBS collection (chi square p= 0.167 and 0.898 for 400 and 5000 cp/ml thresholds) were associated with virological failure. Clinical and/or immunological failure as per WHO 2010 guidelines poorly predicted virological failure at either 1000 or 5000 cp/ml VL thresholds (sensitivity 13.51, specificity 90.00, NPV 29.67, PPV 76.92 at 1000 cp/ml; sensitivity 14.29, specificity 88.16, NPV 73.63, PPV 30.77 at 5000 cp/ml).

Conclusion: Our findings confirm that use of clinical and immunological criteria alone delays identification of treatment failure, potentially resulting in increased risk of selecting HIV drug resistance. VL testing using DBS is feasible and should be implemented in LMIC. Where VL testing is not available, more accurate parameters are needed to trigger prompt recognition of treatment failure.

No conflict of interest

Abstract: P_14

Treatment of pediatric HIV infection

Influence of age and serum creatinine on population pharmacokinetics of emtricitabine in HIV-1 infected children

A. Nguyen[1], B. Robbins[2], R. McKinney[3], M. Rathore[4], E.V. Capparelli[1]

[1]UC San Diego, Pediatric Pharmacology and Drug Discovery, La Jolla CA, USA; [2]University of Nebraska, College of Pharmacy, Omaha NE, USA; [3]Duke University, Pediatrics, Durham NC, USA; [4]University of Florida, Pediatrics, Jackson FL, USA

Background: Emtricitabine (FTC) is a commonly used nucleoside reverse transcriptase inhibitor (NRTI) used for the treatment of HIV infection in adults and children. Despite its wide spread use, very little is known regarding its pharmacokinetics (PK) in children with receiving chronic FTC therapy. The purpose of this study was to describe the multiple dose pharmacokinetics of emtricitabine (FTC) in HIV-1 infected children. The secondary objective was to investigate of the effect of age and serum creatinine (SCR) on FTC PK.

Material & Methods: This population PK analysis was based on data collected from the

Pediatric AIDS Clinical Trials Group (PACTG) Protocol P1021. P1021 was a prospective, open-label study to examine the safety and efficacy of a once-daily regimen of emtricitabine, didanosine, and efavirenz in children. FTC pharmacokinetic data were available in HIV-1 infected children between 3 and 21 years of age. All children received once daily emtricitabine, given as an oral solution (10 mg/mL) or capsule (200 mg), in conjunction with didanosine and efavirenz. The emtricitabine dose was 6 mg/kg once daily to a maximum of 200 mg. Non-linear mixed effect model building was conducted using NONMEM 7.2 using the ITS followed by SAEM subroutine. Allometric scaling was included prior to evaluation of covariates; covariates include age and SCR.

Results: A linear-elimination two-compartment model with lag time adequately described the 625 FTC concentrations collected in the 35 P1021 subjects. The median age was 10.5 years (range 3 - 22) and median SCR was 0.6 mg/dL (range 0.2 - 1.4). Parameter estimates were: apparent clearance (CL/F), 0.75 L/hr/kg$^{0.75}$; central volume of distribution (V/F), 0.11 L/kg; inter-compartmental clearance (Q/F), 0.48 L/hr/kg$^{0.75}$; peripheral volume of distribution (V2/F), 1.56 L/kg; absorption constant (Ka), 0.43 hr^{-1}; and lag time, 0.72 hr. Age and SCR were found to be powerful covariates on CL and was included in final model. For a 3 year old child, CL was estimated to be 0.61 L/hr/kg$^{0.75}$ compared to 0.71 L/hr/kg$^{0.75}$ for a 21 year old. This translates to an area under the curve (AUC) exposure of 156 and 281 ng/mL*hr for a 3 and 21 year old, respectively.

Conclusion: The population PK of FTC was developed in HIV-1 infected children demonstrates large between subject variability due to age. Current dosing in young children results in lower FTC exposure.

Conflict of interest
financial relationship(s): Consultant to Trius Pharmaceuticals and Theravance Pharmaceuticals

Abstract: P_15

HIV infection and adolescents

HIV disclosure and clinical outcomes among HIV-infected adolescents enrolled in HIV care in Kenya; Results from a national retrospective cohort study

E. Ngugi[1], B. Ngeno[1], A. Katana[1], A. Waruru[1], L. Nganga[1], A. Gichangi[1], I. Mukui[2], J. Wamicwe[2], I. Inwani[3]

[1]U.S. Centers for Disease Control and Prevention, Division of Global HIV/AIDS, Nairobi, Kenya; [2]Kenya Ministry of Public Health and Sanitation, Care and Treatment, Nairobi, Kenya; [3]University of Nairobi, Paediatric Department, Nairobi, Kenya

Background: Due to availability of pediatric antiretroviral therapy (ART) more HIV- infected children are surviving into adolescence. Disclosure of HIV status is key for prevention of HIV transmission and optimal adherence to ART. We assessed HIV disclosure and its impact on retention in care and mortality among HIV infected adolescents in Kenya.

Materials & methods: This was a retrospective cohort study of HIV infected children enrolled <15 years into HIV care at 50 randomly selected health facilities between November 1, 2004 and March 31, 2010. We abstracted data from medical records for randomly selected children. Adolescents were defined as children who had attained the age of 10 years at the time of data abstraction. Disclosure was defined as documented knowledge of one's HIV status. We used backward stepwise logistic regression to determine predictors of disclosure and computed probability of retention in care using Kaplan-Meier.

Results: Of the 1,551 adolescents identified, 52.1% were female. Median age at enrolment was 9.4 years (IQR 7.2-11.4) and median follow up time was 4.0 years [Interquartile range (IQR) 2.3-5.4)]. Forty-nine per cent of adolescents were total orphans. Median baseline CD4 was 246 cells/μL. HIV status was disclosed to 480 (30.9%) of the adolescents; the median age of disclosure was

12.0 years (IQR 11.0-14.0). Only older age at enrolment and longer duration of follow-up in care were associated with increased likelihood of disclosure [Odds ratio (OR)1.3; 95% confidence interval (CI) 1.1-1.4 and OR1.0; CI 1.0-1.0, respectively), but not gender, age at HIV diagnosis, orphan hood, enrolment of HIV infected parents into care or HIV disease severity. Among those disclosed to, probability of retention in care was 97.0% compared to 94.1% for those not disclosed to (p=0.02). Those disclosed to had a lower mortality of 0.4% compared to 3.0% amongst those not disclosed to (p=0.01).

Conclusions: Two-thirds of HIV-infected adolescents in this cohort did not know their HIV status. Disclosure was associated with better retention in care and lower mortality. This implies the need for programs to support disclosure to improve clinical care for HIV-infected adolescents.

No conflict of interest

Abstract: P_16

HIV infection and adolescents

A cross-sectional study of prevalence and patterns of disclosure of HIV status to children in western Kenya

M. Scanlon[1], W.M. Nyandiko[2], A. Mwangi[3], M.L. Turissini[1], S.O. Ayaya[2], I. Marete[2], V. Chemboi[4], L. Warui[4], R.C. Vreeman[1]

[1]Children's Health Services Research, Pediatrics Indiana University School of Medicine, Indianapolis, USA; [2]School of Medicine College of Health Sciences Moi University, Child Health and Paediatrics, Eldoret, Kenya; [3]School of Medicine College of Health Sciences Moi University, Behavioral Science, Eldoret, Kenya; [4]USAID-Academic Model Providing Access to Healthcare (AMPATH) Partnership, Pediatrics, Eldoret, Kenya

Background: Disclosure of HIV status is essential to long-term disease management for HIV-infected children and adolescents, yet there is little data on the prevalence and impact of disclosure in resource-limited settings. The objective of this study was to describe the prevalence of disclosure and associated factors among HIV-infected children in western Kenya.

Materials & Methods: We conducted a cross-sectional study using prospectively collected data from a random sample of HIV-infected children ages 6-14 years attending four HIV clinics in western Kenya. Clinicians administered questionnaires independently to children and their caregivers at routine HIV clinic visits. Questionnaires assessed disclosure status, antiretroviral (ARV) adherence, stigma and depression symptoms. Demographic and clinical characteristics were extracted from chart review. We calculated descriptive statistics and described prevalence of disclosure for the overall study population and by age. Univariate analyses with Pearson's chi-squared tests and multivariate logistic regression with odds ratios (OR) and 95% confidence intervals (95%CI) were performed to assess the association between disclosure and demographic, clinical and psychosocial characteristics.

Results: Among 769 participants, mean age was 9.7 years (SD = 2.6) and 51.1% were female. Overall prevalence of disclosure was 26% but varied significantly by age. While 9% of 6- to 7-year olds knew their status, 33% of 10- to 11-year olds and 56% of 13- to 14-year olds knew. In univariate analyses, factors significantly associated with knowing one's status were: older age (p<0.001), higher weight (p<0.001), being an orphan (p=0.043), having a lower CD4 count (p=0.035), taking ARVs (p=0.006), caregiver reports of experienced stigma (p<0.001) or depression symptoms (p<0.001), and child-reported non-adherence (p=0.027). In multivariate regression, older age (OR 1.49, 95%CI 1.35-1.63), being on ARVs (OR 2.27, 95%CI 1.29-3.97), and caregiver-reported depression symptoms (OR 2.63, 95%CI 1.12-6.20) significantly increased the odds of disclosure. Treatment site was associated with disclosure at two clinics (OR 3.44, 95%CI 1.75-6.76).

Conclusions: This study found low prevalence of disclosure among children in western Kenya, with significant relation to clinical, emotional, and social factors. More data are needed on when and how children in resource-limited settings learn their HIV status and the impact of disclosure.

No conflict of interest

Abstract: P_17

HIV infection and adolescents

Characteristics and risk behaviours of perinatally HIV-infected and HIV-uninfected young people recruited into a new adolescent cohort, UK

A. Judd[1], C. O'Leary[1], M. Le Prevost[1], L. McDonald[1], D. Dunn[1], C. Thorne[2], D. Mercey[3], P.A. Tookey[2], D.M. Gibb[1], . on behalf of the Adolescents and Adults Living with Perinatal HIV[4]

[1]Medical Research Council, Clinical Trials Unit, London, United Kingdom; [2]University College London, Institute of Child Health, London, United Kingdom; [3]University College London, London, United Kingdom

Background: Children with perinatal HIV (PHIV) in Europe are now transferring to adult care. Follow-up as well as comparison to HIV-uninfected control groups is required to address key questions about the impact in adult life of life-long HIV and long-term ART. We describe sociodemographic, drug use and mental health characteristics of the first 96 participants recruited into the new Adolescents and Adults Living with Perinatal HIV (AALPHI) cohort.

Materials & methods: Perinatally HIV-infected (PHIV+) and HIV negative (HIV-) individuals aged 13-21 years are being enrolled from 12 clinics/NGOs since August 2012; annual follow-up visits are planned. PHIV+ have had paediatric care in the UK and HIV- are living in the same household as a PHIV+ or have an HIV+ parent/sibling. Sociodemographic characteristics are recorded in nurse-administered questionnaires, drug use/ mental health variables by computer-assisted survey interviewing, and depression and anxiety using the Hospital Anxiety and Depression Scale (HADS). Descriptive statistics were used to characterise participants.

Results: Among the first 96 participants (77 PHIV+, 19 HIV-), 61 (64%) were from London, 76 (80%) were black African and 54 (57%) were born abroad. 38 (40%) were male and median age at entry was 17.0 years (IQR 15.0,18.7). 94 (99%) were single, one male participant had children, and 85 (89%) lived with parents/carers. 80 (90%) were in education, 18 (20%) paid work, and 4 unemployed. 6 of the 19 HIV- were siblings of PHIV+ in the study. 32 (42%) of PHIV+ had one/both biological parents who had died. Median age at disclosure of HIV status was 12 years (n=58; IQR 11,13). 68 (91%) were on ART at recruitment, and self-reported adherence (no missed doses) over the previous three days was 75%; 5 of the 7 not on ART had previously taken ART. For PHIV+ and HIV-, 44 (46%) reported drinking alcohol, nine (9%) currently smoked, 18 (19%) had used cannabis and 2 cocaine. None reported injecting drug use. 33 (35%) reported having vaginal sex and three (3%) anal sex. Of 32 reporting sex in the previous year, 20 (63%) reported always using a condom, 9 (28%) sometimes, and 3 never. One female had been pregnant. Of 92 completing HADS, 57 (62%) had normal anxiety scores and 78 (85%) normal depression scores; none scored 'severe'. 8 (9%) had been referred to mental health services, 21 (23%) had self-harmed and 27 had suicidal ideation.

Conclusions: Levels of alcohol use, smoking, self-harm, anxiety and depression are similar to norms for young people in the UK population, whereas sexual activity and drug use are lower. Prevalence of suicidal ideation is more than double that in a large sample of HIV- young people in England. Recruitment into the study is ongoing (400 PHIV+ and 300 HIV- will be recruited in total), and updated results, including further differences between PHIV+ and HIV-, will be presented at the workshop. This study provides for the first time critical data on the health and wellbeing of young people with perinatal HIV and a comparison group of HIV-affected individuals in the UK.

No conflict of interest

Abstract: P_18

HIV infection and adolescents

Knowledge, Attitudes, and High-Risk Behaviour Related to HIV/AIDS Transmission among Adolescent Street Children in Jakarta, and Its Related Factors

A.R. Dewi[1], N. Kuniati[1]

[1]Cipto Mangunkusumo General Hospital, Child Health Department, Jakarta, Indonesia

Background: Street children are highly vulnerable for many social and health problems including HIV/AIDS transmission. The number of street children is on the rise in Jakarta as the capital city of Indonesia and is commonly unreachable by government health programs, while very little is known about their knowledge, attitudes, and behavior related to HIV/AIDS transmission.

Materials & Methods: This is a mixed method (quantitative and qualitative) study which aims to determine knowledge of HIV (transmission, prevention, and treatment), attitudes toward HIV, and high-risk behaviors (smoking, alcohol consumption, drug abuse, sexual behavior, condom use, prostitution, sexual orientation, and tattooing using non-sterile needles) among adolescent street children (age 10-18 years old) using validated questionnaires.
Data were then tabulated and calculated to measure the degree of knowledge, attitudes, and high-risk behavior, and were analyzed using chi-square (bivariate) and logistic regression (multivariate) analysis to identify the correlation with several demographic factors. In-depth interview, focus group discussion, and observation were done to explore further the engagement of risky behaviours.

Results: At the time of the survey, 35% of street children never heard about HIV/AIDS and most participants (85%) had low knowledge about HIV/AIDS. Misconception about HIV/AIDS were also common, e.g. opinion that HIV can be transmitted by mosquitoes, sharing foods, and clothes. Factors that increased likelihood of having low knowledge about HIV/AIDS were low education level (OR=6.38; 95% CI=1.32-30.75) and low socio-economic status (OR=12.75; 95% CI=1.40-116.04). Most participants (60%) were engaged in at least one of high-risk behaviors. Seventeen percent of street children were sexually experienced and all of them had their first sexual intercourse when they were living on the street. The median age at first sexual activity was 13 years old. Condom use were very low, i.e. 82,4% sexually experienced participants never use condom. The prevalence of smoking, alcohol consumption, and drug abuse among participants were 58%, 45%, and 26% respectively. The median age of first smoking and alcohol drinking were 11 and 12 years old. Factors that increased the likelihood of displaying risky behavior were being male (OR=8.77; 95% CI=2.77-27.79), older age (OR=55.76; 95% CI=14.53-214), being street children more than 5 years (OR=3.72; 95% CI=1.5-9.24), working on the street more than 35 hours a week (OR=4.28; 95% CI=1.83-10.01), living on the street (OR=8.77; 95% CI= 3.47-22.17), and less contact with parents (OR=7.76; 95% CI=3.13-19.23). The qualitative investigation revealed that prostitution, homosexuality, and teenage pregnancy were prevalent among street children, and low law enforcement regarding access to alcohol, cigarettes, and drug use had largely contribute to their engagement to high-risk behaviors.

Conclusions: Street children need to be regarded as a high-risk group for acquiring HIV. The low knowledge about HIV/AIDS and high engagement of risky behavior among adolescent street children requires a comprehensive and multidisciplinary approach due to its complex conditions. The integrated risk-reduction programs that take into account all problematic behaviors such as high proportion of alcohol consumption, drug use, and risky sexual behavior targeting adolescent street children need to be addressed.

No conflict of interest

Abstract: P_19

HIV infection and adolescents

Adolescent friendly services among HIV positive clients attwo health facilities in Rwanda

S. Niyonsenga[1], M. Ribakare[1], S. Nsanzimana[1], N. Gupta[2], C. Baribwira[3]

[1]Rwanda Biomedical center, HIV division, Kigali, Rwanda; [2]Partners in Health, division of global health equity Brigham & Women's hospital, Kigali, Rwanda; [3]Maryland University School of Medicine , Kigali, Rwanda

Background: Given the increasing number of perinatally HIV-infected children accessing effective antiretroviral therapy (ART) and significant number of adolescents acquiring HIV infection horizontally including through risky sexual behavior, the burden of HIV infection amongst adolescents is an emerging health issue in sub-Saharan Africa. In spite of this reality, most service delivery programs are not yet tailored to the special needs of this age group, especially in resource-constrained settings. In this setting, the Rwanda Biomedical Center developed and implemented a model to deliver adolescent friendly services for HIV-positive adolescents. This model emphasized five key strategies: capacity building of health workers in the provision of adolescent health services, establishment of efficient-referral-systems for specialized health services; empowerment of primary caregivers and adolescents through peer-education& support (via leadership training, psychosocial support-groups, and development of educational materials), establishment of cross-sectoral linkages with both clinical and non-clinical services, and generating evidence for adolescent HIV services.

Materials & Methods: All HIV positive adolescents aged to 15-19 years enrolled in the adolescent clinics at Centre Hospitalier Universitaire de Kigali and Ruhengeri District Hospital and in follow-up for at least one year at the time of the survey were included in the study. Chart review of routinely collected data was conducted. The adolescents were then interviewed on their treatment adherence using the Visual Analog Scale (VAS), HIV-related knowledge, barriers to care, satisfaction with care services, and psychological state using Beck Depression Inventory (BDI). Study was approved National Ethics Committee.

Results: Overall, 199 adolescents were actively enrolled for at least one year in the two clinics and consented for the study. The median age of enrollment was 16 years (interquartile range: 15, 18), and 89% (177 of 199) had initiated ART. Sixty-one percent (107 of 175) depicted good immunological evolution (increase of >30 cells/cm3/6month), 12% had no immunological response (static CD4), and 27% had immunological failure (>50% decrease from peak CD4 or CD4 decrease to below pre-treatment value). Overall, 51.3% (73 of 142) had complete viral suppression (viral load of < 40 copies) and 37% had viral load failure (>1000 copies). In regards to medication adherence, 55.6% (79 of 142) reported an adherence of 85% or less on VAS. Barriers to medication and visit adherence included food insecurity (69.9%), unawareness of scheduled appointments (68.7%), fee for services (64.8%), stigma (19.1%), and lack of community-based insurance (18.1%). Forty-nine percent (96 of 197) demonstrated depression by the BDI. Overall, 84.4% (167 of 198) of adolescents reported that they were satisfied with the adolescent clinic services provided.

Conclusions: The findings of this report serve to provide useful lessons that can help strengthen programing efforts for HIV+ adolescents in Rwanda. Most importantly, in order to improve treatment response, adequate adherence must be ensured by tailoring care to the unique needs of adolescents, including educational, nutritional, socioeconomic, and psychosocial supports. Additional research efforts are needed to strengthen program design for HIV-positive adolescents.

No conflict of interest

Abstract: P_20

HIV infection and adolescents

Adherence to antiretroviral treatment (ART) amongst adolescents enrolled in Teen Club in Mwanza, Tanzania

A. Mwale[1], L. Plafsky[1], C. Gingaras[2], W. Elimwaria[1], L. Tolle[1], A. Gesase[1], A. Jones[1], A. Kayabu[1], S. Shea[1], M. Minde[1], M. Tolle[1]

[1]Baylor College of Medicine Children's Foundation - Tanzania, Pediatrics, Mwanza, Tanzania; [2]BCM - UT School of Public Health, Public Health, Houston, USA

Background: Adherence to antiretroviral treatment (ART) is a major obstacle to good treatment outcomes for HIV-infected adolescents. At the Baylor Children's Foundation - Tanzania Lake Zone Children's Centre of Excellence (COE) in Mwanza, Tanzania, a structured peer support group - 'Teen Club' - exists to facilitate life skills development and preparation for positive adult living in HIV-infected adolescents, the majority of whom are perinatally-infected and struggle with a broad range of socioeconomic issues. Teen Club is available to all adolescents at the Centre, and a key specific skill focused upon in monthly meetings is maintaining self in care and maintaining full adherence to ART. This study compares adherence to ART amongst Teen Club members before and after Teen Club enrollment.

Materials & Methods: Retrospective chart review. Inclusion criteria: 2012 Teen Club members with data sufficient for review; exclusions were due to lack of proper adherence documentation or otherwise incomplete adherence data. Data collected: specific adherence percentages, spanning from enrollment at the COE through December 2012. Each member's average adherence based on nurse pill count from all clinic visits pre- and post-registration was calculated. These averages were then absolutely defined as good (between 95-105%) or poor (<95%, >105%).

Results: 82 of 170 Teen Club members as of December 2012 were included in the study. 41.5% had poor adherence before Teen Club registration, and 20.7% had poor adherence after Teen Club registration (50.1% change, p=.0007). Amongst these 82 patients, 26.8% (22/82) of the teens attended 3 or fewer monthly Teen Club sessions throughout 2012; 13.4% (11/82) attended between 4 and 6 sessions; and 59.8% (49/82) attended 7 or more. Members who attended 3 or fewer sessions went from mean 54.5% poor adherence to 36.4% poor adherence (33% change, p=.07); between 4 and 6 sessions went from average 36.4% poor adherence to 27.3% poor adherence (25% change, p=.49); and 7 or more sessions went from average 36.7% poor adherence to 12.2% poor adherence (66.8% change, p<0.0001).

Conclusions: This study suggests that enrolling and attending Teen Club may have an effect on improving ART adherence, especially amongst those who attend regularly. There are many limitations to this study, including the high proportion of excluded charts based on incomplete documentation, as well as they study's retrospective nature and inability to control for confounding factors. Nonetheless, while programmes such as Teen Club are becoming common parts of adolescent HIV programming in Africa, data on their impact are currently quite limited. This study's suggestion of positive impact on ART adherence merits further evaluation, including with a well-designed prospective cohort study, and this is now in process at the COE. Further rigorous evaluations of Teen Club outcomes, including comparison with a control population of non-attendees, are also of interest. Qualitative impacts of Teen Club should also be assessed, as much of the benefit to structured peer support is likely in terms of improved self-esteem and changes in outlook and expectations for life.

No conflict of interest

Abstract: P_21

HIV infection and adolescents

Higher rates of triple class virologic failure in perinatally HIV-infected teenagers compared to heterosexually infected young adults

P. Rojo[1], on behalf of PLATO II.

[1]Hospital 12 de Octubre, Department of Pediatrics, Madrid, Spain.

Background: Children with perinatally-acquired HIV (PHIV) require life-long antiretroviral therapy (ART), so development of triple class virologic failure (TCVF) is of particular concern. We compared rates of TCVF across age groups for PHIV and heterosexually-infected young adults (HHIV).

Materials & methods: Patients from Collaboration of Observational HIV Epidemiological Research Europe (COHERE) cohorts who started ART from 1998, aged <20 for PHIV and 15-29 for HHIV, with Ž2 NRTIs and an NNRTI or a PI/r were followed from ART initiation until their last measured viral load (VL). Virologic failure of a drug was defined as VL>500c/ml despite Ž4 months use. TCVF was defined as cumulative failure of 2 NRTIs, an NNRTI and a PI/r.

Results: Of 5166 HHIV patients, 182 (3.5%) developed TCVF, as did 74 of 879 (8.4%) PHIV. The cumulative proportion with TCVF by 5 years after starting ART was 4.7% (95% CI:3.9%-5.5%) in HHIV and 9.6% (95% CI:7.1%-12.1%) in PHIV. The rate at which TCVF developed varied by age at ART initiation, and was highest in PHIV aged 10-14 and 15-19 (Figure). 23.0% (95% CI:12.1%-33.9%) of PHIV aged 10-14 had TCVF by 5 years. Predictors of TCVF included PHIV aged 10-14, African origin, pre-ART AIDS, and an NNRTI-based initial regimen (Table), but not calendar time. In PHIV aged 10-14 there was a trend towards higher risk of TCVF in European-born compared to African-born patients (HR 2.1, 95% CI:0.9-5.3), contrary to the trend overall, although an interaction between age and region of origin was non-significant. Among PHIV aged 10-14, the median number of weeks between diagnosis and ART initiation was 24 [IQR 5-131] for African-born and 278 [54-516] for European-born patients.

Conclusion: High levels of TCVF were observed in PHIV aged 10-14 and 15-19 years at ART start. European-born PHIV aged 10-14 had particularly high levels of TCVF, and had been diagnosed for some time before starting ART. There may be a beneficial effect of starting ART prior to adolescence, to help attain and sustain virologic suppression before the onset of this transitional stage of development.

Conflict of interest

Abstract: P_22

Co-infections in HIV-infected children

Seroprotection and acceptability of immunization with Neisseria meningitidis C conjugated vaccine among HIV vertically-infected children, in Brazil

A.C.C. Frota[1], L.G. Milagres[2], G.S. Pereira[2], A.C. Cruz[2], B.F. Silva[1], D. Menna-Barreto[3], L.H. Harrison[4], R.H. de Oliveria[1], T.F. Abreu[1], C.B. Hofer[5]

[1]Universidade Federal do Rio de Janeiro, Pediatrics, Rio de Janeiro, Brazil; [2]Universidade Estadual do Rio de Janeiro, Microbiology, Rio de Janeiro, Brazil; [3]Universidade Federal do Rio de Janeiro, Medicine Preventive, Rio de Janeiro, Brazil; [4]University of Pittsburgh, Infectious Diseases Epidemiology Research Unit, Pittsburgh, USA; [5]Universidade Federal do Rio de Janeiro, Preventive Medicine - Infectious Diseases, Rio de Janeiro, Brazil

Background: Meningococcal disease (MD) is a serious public health problem, with high letality. In Brazil, since 2007 all HIV infected children have been immunized with one dose of *Neisseria meningitidis* C conjugated vaccine (C Polysaccharide/CRM_{197}) intramuscularly, free of charge. The aim of this is study is to describe the seroconversion rate and factors

associated with seroprotection among HIV vertically-infected children.

Materials & methods: HIV-infected patients, aged 2-18 years old, with CD4+ cell > 15% or 350 cell/mm^3, without active infection or opportunistic disease, without antibiotic use, were enrolled. Post-immunization protective antibody titer was defined as a serum bactericidal assay ≥ 1:4 (with human complement) 1-2 months after the immunization. Patients were evaluated during the immunization, at 20 minutes, and after 3 days and 7 days for adverse events. The bivariate analysis was performed, and variables with p-value <0.15 were independently evaluated through logistic regression analysis.

Results: 145 children were enrolled. Median age was 13 years. 81 (56%) were female, 79 (54%) had a history of at least one C clinical category (CDC) event, and 127 (88%) were using HAART. The nadir median CD4 cells % was 13 (range 0%-47%). 58/145 (40%) had post-immunization protective antibody titer, among them, 23 (15.9%) had already protective antibody titer before the immunization. 54 (37%) presented minor adverse reactions: 6 (4%) had fever; 34 (23%) pain at the immunization site; and 31 (21%) malaise. No major adverse event was observed. Factors associated with protective antibody concentration were: Had no history of a category C event (OR= 2.1, 95%CI=1.0- 4.3); viral load (VL) undetectable at time of immunization (OR=2.4, 95%CI=1.2-5.1), and higher number of individuals living in the same house (OR=1.3, OR=95%1.0-1.5).

Conclusion: The proportion of children with post-immunization protective antibody titer was lower than expected, probably due to population characteristics (e.g., low median nadir CD4 cell percent, presence of category C event). However, the vaccine was well tolerated. In order to maximize the immune response, individuals must be immunized when the VL is undetectable, and probably with more than one dose.

No conflict of interest

Abstract: P_23

Co-infections in HIV-infected children

Serologic persistent following infant HBV vaccination and immunogenicity following one dose revaccination in HIV-infected children and adolescents

A. Paveena[1], K. Lapphra[1], S. Saihongthong[1], K. Chokephaibulkit[1]

[1]Siriraj Hospital Mahidol University, Pediatric Department, Bangkok, Thailand

Background: Hepatitis B virus (HBV) infection leads to poor outcome in HIV-infected patients. Infant HBV vaccination has been included in the National Immunization Program before the emergence of HIV infection in Thailand. It is expected that all HIV-infected children would be protected from HBV infection. However, HIV infection may lead to a loss of immunity and breakthrough infection may occur. Re-immunization against HBV has been recommended in children with severe immune suppression who later had immunologic recovery following antiretroviral therapy (ART). We investigated the breakthrough infections and response to re-immunization in HIV-infected Thai children who have been receiving ART.

Materials & methods: A cross-sectional serologic testing for HBV including HBs-Ag, anti-HBs, and anti-HBc were performed in all children receiving long-term ART at Siiraj Hospital, Bangkok, during May 2012 - January 2013. Children who met the following criteria were re-immunized with 3-dose intramuscular at 0, 2, and 6 months: nadir CD4 ≤ 15% and current CD4 >25% for at least 6 months after ART, or current CD4 15-25% but HIV RNA < 400 copies/ml for at least 1 year. The vaccine used was the product from Government Pharmaceutical Organization-Merieux Biological Product, Bangkok, at the dosage of 10 µg/dose. Anti-HBs antibody level was measured at 1-3 months following the 1st and 3rd dose of re-vaccination using Roche Elecsys® Anti-HBs Immunoassay.

Results: Of the 193 children tested, 5 (2.6%) had positive anti-HBc indicating breakthrough infection, 4 (2.1%) had positive HBs Ag indicating chronic infection, 23 (11.9 %) had positive anti-HBs, and 166 (86 %) had negative results for all the 3 markers. All of these children received 3-dose infant HBV vaccination. Seroconversion rate following one dose of HBV vaccination in those who met the re-immunization criteria was 53.5% (53/ 99); and 24(24%) and 4 (4%) children had anti-HBs > 100 IU/mL and 1000 IU/mL, respectively. No serious adverse events were reported during the study.

Conclusions: High rate of loss of immunity in HIV-infected children was observed, however, breakthrough infection was infrequent. Low rate of anamnestic antibody response following one dose suggested the importance of 3-dose re-immunization in children who loss immunity.

No conflict of interest

Abstract: P_24

Co-infections in HIV-infected children

The Baylor-Mbeya (Tanzania) Pediatric Kaposi Sarcoma Clinic – Description and Outcomes

L. Campbell[1], J. Bacha[1], N. El-Mallawany[2], B. Anosike[1], E. White[1], T. Jacob[1], J. Bradford[1], J. Sloan[3], A. Agrawal[3], J. Margolin[4], P. Mehta[4], E. Samky[5], J. Bisimba[6], M. Tolle[7]

[1]Baylor College of Medicine Children's Foundation - Tanzania, Pediatrics, Mbeya, Tanzania; [2]Baylor College of Medicine Children's Foundation - Malawi, Pediatric Hematology-Oncology, Lilongwe, Malawi; [3]Botswana-Baylor Children's Clinical Centre of Excellence, Pediatric Hematology-Oncology, Gaborone, Botswana; [4]Baylor College of Medicine - Texas Children's Hospital, Pediatric Hematology-Oncology, Houston, USA; [5]Ministry of Health and Social Welfare, Mbeya Referral Hospital, Mbeya, Tanzania; [6]United States Agency for International Development - Tanzania, Pediatrics HIV, Dar es Salaam, Tanzania; [7]Baylor College of Medicine Children's Foundation - Tanzania, Pediatrics, Mwanza, Tanzania

Background: Kaposi sarcoma (KS), associated with human herpesvirus-8 (HHV-8) infection, is the most common HIV-associated malignancy in sub-Saharan Africa. Tanzania has one of the highest pediatric HHV-8 prevalence rates in the world. Consequently its HIV-infected pediatric population is predisposed to develop KS. To provide comprehensive care for these pediatric KS patients, an oncology program was developed at the Baylor Mbeya Center of Excellence (COE). Diagnosis and management are supported by specialists from the Baylor network and its partners, while chemotherapy and direct patient care are delivered in the Mbeya COE. This study aims to describe the baseline characteristics and outcomes of patients diagnosed with KS and enrolled in the program, the only of its kind in Tanzania outside Dar es Salaam.

Materials & Methods: Retrospective chart review was done using programmatic data from the Mbeya COE. Inclusion criteria: HIV infected children diagnosed with KS between 1 March 2011 and 31 Jan 2013. Baseline data collected: gender, age, KS clinical presentation, WHO immunological stage, and ART status. Outcomes data: treatment outcome, chemotherapy regimen, complications, and ART regimen.

Results: Data analyzed from 16 patients. Baseline data: 31% female (5/16); age 4-18 years (mean 10.8 years). Diagnosis by biopsy: 75% (12/16). Characteristics at time of diagnosis: 63% (10/16) skin lesions, 56% (9/16) lymphadenopathy, 31% (5/16) oral lesions, 38% (6/16) woody edema, 25% (4/16) non-woody edema, 19% (3/16) more than 20 skin lesions, 6% (1/16) presumed pulmonary. WHO severe immunosuppression: 69% (11/16). 69% (11/16) on ART at time of diagnosis, all on first line regimen. Median time on ART prior to diagnosis of KS: 11 months (1.5-75 months). 36% (4/11) virologic or immunologic evidence of treatment failure.
Outcomes data among those receiving chemotherapy for 2 months or greater (n=15): 40% (6/15) achieved complete clinical remission (CCR); 33% (5/15) partial remission (PR)/stable disease, 13% (2/15) died; 7% (1/15) LTFU; 7% (1/15) relapse. Of those with PR, 80% (4/5) had residual woody edema and 20% (1/5) were in PR while still receiving chemotherapy. For patients with CCR, median time between diagnosis and end-of-study: 10 months (3-18 months).

All patients were initially treated with bleomycin and vincristine (BV). Excluding patients with woody edema, those who did not achieve CCR with BV (19%; 3/16) were given 3 drug therapy (BV+doxorubicin). 81% (13/16) patients experienced complications during chemotherapy: 38% (5/13) peripheral neuropathy, 31% (4/13) severe constipation, 23% (3/13) neutropenia, none developed sepsis. 75% (12/16) were on an EFV- or NVP-based regimen during chemotherapy and 25% (4/16) were on a lopinavir/ritonavir-based regimen.

Conclusions: Care for pediatric patients with KS is challenging in a resource-limited setting. ART alone does not appear to be sufficient to treat KS in children. With chemotherapy and ART, good outcomes are possible outside major teaching hospital settings in Africa, with low mortality rates. Expansion of the availability of pediatric oncologic care in Africa should be a priority as health systems mature. Further research is needed to better characterize long-term outcomes of pediatric patients with KS as well as optimal antiretroviral therapy in the context of KS.

No conflict of interest

Abstract: P_25

Late Breaker

HIV disclosure and its effect on treatment outcomes in HIV-infected Thai children and adolescence

C. Sirikum [1], J. Sophonphan [1], T. Chuanjaroen [1], S. Lakonphon [2], A. Srimuan [1], P. Chusug [1], W. Prasitsuebsai[1], T. Puthanakit[1,3], J. Ananworanich[1,2,4] , T. Bunupuradah[1] on behalf of HIV-NAT 015 study team

[1]HIV-NAT, The Thai Red Cross AIDS Research Center, Bangkok, Thailand;[2]Department of Pediatrics, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand; [3]Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand; [4]SEARCH, The Thai Red Cross AIDS Research Center, Bangkok, Thailand

Introductions: HIV-infected children are surviving into adolescence after receiving antiretroviral therapy (ART). However, many caregivers are reluctant to disclose the HIV status to their children. There are limited data of HIV disclosure and its effect on treatment outcomes in Asian children with HIV.

Methods: A cross-sectional study was conducted at HIV-NAT, the Thai Red Cross AIDS Research Centre, Bangkok during June-December 2012 in HIV-infected children ages ≥6 years. Primary caregivers were interviewed by nurses to assess their children's disclosure status and demographic data. Pill counts were performed by nurses every 3 months. CD4 and viral load were checked every 6 months. Correlation of disclosure status with demographic data, and treatment outcomes was analyzed by SPSS and logistic program.

Results: Data of 269 HIV-infected children, 50% male, median (IQR) age 15 (12.2-17.3) years were included. 97% were vertically HIV-infected children. Percent of CDC classification N:A:B:C was 19:38:23:20%. 80% of children lived with their families. 96% were using ART. Median (IQR) percent adherence by pill count was 99.3 (94.4 -100)%. The current median (IQR) CD4% was 28(23-32)%, CD4 690(510-923) cells/mm^3. 79.2% had current HIV-RNA<50 copies/ml.
70.3 % of children knew their HIV status. Median (IQR) age at disclosure was 12 (10-14) years. By multivariate analysis, associated factors to HIV disclosure were current age ≥ 12 years (OR 19.3, 95%confidence interval 9.4-39.4) and current CD4 ≤ 30% (OR 2.4, 95%confidence interval 1.2-4.6). No associations between gender, CDC classification, disclosure status, type of residence (living with family vs. orphanage), school attendance, type of caregiver, use of ART, percent adherence by pill count, and current HIV-RNA were found.

Conclusions: Seventy percent of HIV-infected children and adolescence in this study knew their HIV status. The percentage of HIV-disclosure significantly increased from our previous study (18%) in 2007. No association of HIV disclosure with either adherence or virologic outcomes was found.

No conflict of interest

Abstract: P_26

Late Breaker

Infant PreP to prevent Breastfeeding Transmission of HIV: Interim Results of the ANRS 12174 Trial Using Boosted Lopinavir or Lamivudine in Africa

T. Tylleskar[1], N. Nagot[2*], C. Kankasa[3], N. Meda[4], J. Tumwine[5], A. Aku[6], M. Mwiya[3], G. Ndeezi[6], R. Vallo[2] and P. Van de Perre[2] for the ANRS 12174 trial group. * Contributed equally to this work*

[1] University of Bergen, Bergen, Norway;[2] INSERM U1058 & Université Montpellier 1, Montpellier, France; [3] University Teaching Hospital, Lusaka, Zambia; [4] Université de Ouagadougou, Ouagadougou, Burkina Faso; [5] Makerere University, Kampala, Uganda; [6] University of the Western Cape, Cape Town, South Africa

Background: The WHO 2010 recommendations for the prevention of mother-to-child postnatal transmission of HIV-1 propose the use of infant prophylaxis using nevirapine (option A) or maternal HAART prophylaxis (option B) for the entire period of breastfeeding. However, the efficacy of option A during 12 months has never been assessed, and data are urgently needed for the ongoing revision of the WHO recommendations.

Subjects and Methods: The ANRS 12174 study (ClinicalTrials.gov Identifier: NCT00640263) is a randomised controlled trial comparing the efficacy and safety of prolonged infant peri-exposure prophylaxis (PreP) with lopinavir/ritonavir (LPV/r) versus lamivudine to prevent postnatal HIV-1 transmission during the full duration of breastfeeding (1 year), in children born to HIV-1-infected mothers not eligible for HAART (CD4 above 350 cells/µL). Seven days old HIV-uninfected newborns were randomised for either drug in a 1:1 ratio. Infant HIV-infection status was assessed at day 7 and every 3 months using HIV-1 DNA PCR. The study has now completed enrolment (April 2012) in four African countries: Burkina Faso, Uganda, Zambia and South Africa. The April 2012 meeting of the Data monitoring Committee recommendation was to continue and complete the study. Because the study was highly powered to provide a tight estimation of the overall HIV transmission, we report data from the first 763 children who completed follow-up without unblinding to inform policy makers.

Results: Of the 1273 children enrolled in the trial and randomised, 763 of them had completed or passed the 50 weeks final visit by mid-July 2012, accumulating 669 child-years of follow-up. The mothers of these children were aged 27 years on average, and had a mean CD4 count of 527 cells/µL. Overall, 9 transmissions have been identified by HIV DNA PCR on dried blood spots, representing a transmission rate of 1.3/100 child-yrs (95%CI: 0.5-2.2). Interestingly, 6/9 transmissions occurred after 6 months of breastfeeding. Overall, 18 deaths were identified, giving a mortality rate of 2.6/100child-yrs (95%CI: 1.4-3.8). The mean time between the last HIV negative test and death was 6 weeks (SD: 2.8), and no death was deemed likely attributable to HIV in an independent clinical expertise. The HIV-free survival at 28 and 50 weeks was 98.5% and 96.2%, respectively.

Conclusions: The infant PreP strategy (the WHO option A) using LPV/r or lamivudine for one year can achieve a very low rate of postnatal transmission in Africa, well within the target of elimination.

No conflict of interest

Abstract: P_27

Late Breaker:

Characteristics, Management and Twelve Month Outcomes following Highly Active Antiretroviral Treatment Failure among Perinatally HIV-Infected Children and Adolescents in the US

L. Fairlie[1], B. Karalius[2], K. Patel[2], R.B. Van Dyke[3], M. Hernan[2], G.K Siberry[4], G.R. Seage III[2], A. Agwu[5], H. Mendez[6], R. Hazra[4], and A. Wiznia[7] for the Pediatric HIV AIDS Cohort Study (PHACS) and The International Maternal Pediatric Adolescent AIDS Clinical Trials (IMPAACT).

[1]Wits Reproductive Health & HIV Institute (WRHI), University of the Witwatersrand, South Africa; [2]Harvard

School of Public Health, Boston, USA; [3]Tulane University Health Sciences Center, New Orleans, USA; [4]Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), National Institutes of Health, USA; [5]Johns Hopkins University School of Medicine, Baltimore, Maryland, USA; [6]SUNY DOWNSTATE, Brooklyn, New York, USA; [7]Jacobi Medical Center/Family Based Services, Bronx, New York, USA.

Background: Few studies address virologic failure (VF) in HIV-infected children. We describe characteristics, management and 12 month immunological and virological outcomes of children failing HAART in two US-based perinatally HIV-infected (PHIV+) cohorts comparing four treatment strategies: 1) continuing failing HAART, 2) switching to a new HAART regimen, 3) switching to a HAART sparing regimen and 4) stopping all ART.

Methods: All PHIV+ children enrolled in the non-interventional International Maternal Pediatric Adolescent AIDS Clinical Trials 219C study and the Pediatric HIV/AIDS Cohort Study between 1993 and 2012 were included. VF was defined as plasma HIV RNA > 1,000 copies/ml on two consecutive occasions ≥1 month apart after at least 6 months of HAART, defined as at least 3 ARVs from at least 2 drug classes. Pre-HAART demographic and clinical parameters were compared among those who did, and did not, experience VF. Characteristics of their latest HAART failure are described. For each of the four treatment strategies we estimated the mean change from baseline in CD4% and $\log_{10}$HIV RNA at 12 months. A weighted linear regression model for change from baseline was fit for each outcome, which included treatment strategy, sex, baseline age, ARV adherence (100% or <100%), HAART failure year (≤2001, >2001), indicator for previous HAART failure, HAZ-score, WAZ-score, $\log_{10}$HIV RNA, nadir CD4%, and CDC class (C/not C). Robust standard errors were calculated to compute 95% confidence intervals around the parameter estimates.

Results: VF was observed in 939 (40%) of 2374 enrolled children with 84% experiencing one; 15% two; and 1% three or more HAART failures. A shorter duration of pre-HAART ARV use (Median 3.7 vs. 4.2 years; p=0.02) was associated with VF. A protease inhibitor(PI)-containing regimen with a nucleoside reverse transcriptase inhibitor (NRTI) backbone was the failing regimen for 67%, with nelfinavir the most common ARV (36%) included. Six months after VF was identified, 85% remained on the failing regimen, 8% switched to a new HAART regimen, 3% a HAART-sparing regimen and 4% stopped all ART. Children who stopped ART had the greatest mean change in CD4 percentage at 12 months after VF, with a 3.17 percentage decline from baseline (95% CI (-1.10, -5.24); p=<0.001) compared to those who were switched to a new HAART regimen (+0.59%) with no difference in the other two groups. There was a smaller drop in $\log_{10}$ HIV RNA in those continuing their failing regimen (-0.27; p=<0.001) and stopping all ART (-0.2; p=<0.001) than in those changed to a sparing regimen (-0.84; p=0.303) when compared to those switching to a new regimen (-1.15).

Conclusions: In this US-based longitudinal study 40% of children failed a HAART regimen. Twelve months after VF, children stopping all ART had the greatest mean CD4% drop from baseline, raising concern about treatment holidays as a strategy for VF in children. In the absence of a new HAART regimen or when the risk of nonadherence is high, a HAART-sparing regimen may be a reasonable option for children with VF

No conflict of interest

Abstract: P_28

Late Breaker

Challenges Reported by HIV+ Mothers Administering Long-term Nevirapine Syrup to Their Infants at Home: Mulago Hospital, Uganda

J. Matovu-Namale[1], Z. Namukwaya[1], M. Mubiru[1], E. Musingye[1], M. Kyalimpa[1], A. Kakande[1], S. Kamya[1], P. Musoke[1], M. Kamya[2], M.G. Fowler[1,3]

[1]Makerere University – Johns Hopkins University Research Collaboration, Kampala, Uganda; [2]Mulago Mbarara Teaching Hospitals Joint AIDS program, Kampala, Uganda; [3]Johns Hopkins Medical Institutes, Baltimore, United States

Background: The Uganda 2010 MOH guidelines recommended 2 equally-effective PMTCT options (A & B) for breastfeeding mothers. For option A, infants receive daily infant NVP syrup from birth until one week after breastfeeding cessation. For Option B & B+, infants receive 6 weeks of NVP syrup; similar to infants of mothers requiring antiretroviral treatment. We share the challenges reported by HIV infected breast feeding mothers who came back for various postnatal clinic visits to receive NVP refills for their infants. Some mothers had delivered at Mulago hospital and others from other health centers.

Methods: At delivery, all HIV infected mothers who deliver at Mulago hospital with live births are counseled and demonstrated to on how to administer NVP syrup at home. The health worker administers the initial NVP syrup dose to the new born at the health facility and the mother is provided with a 100 or 240 ml NVP syrup bottle and pre-marked syringes to use at home. Mothers are required to come back to the postnatal clinic for NVP syrup refills throughout the breastfeeding period as per the Uganda MOH 2010 guidelines. At postnatal clinic visits, all breastfeeding mothers who bring back their infants to get NVP syrup refills, are interviewed and requested to share any challenges related to administering of NVP syrup to their infants at home. We share challenges reported by HIV+ mothers attending Mulago PNC, who delivered at Mulago hospital and other health centers.

Results: Between 1st January 2012 and 31st January 2013, a total of 3,859 breast feeding HIV+ mothers who were administering NVP syrup to their infants at home made 6,526 PNC visits to get NVP syrup refills for their infants. Among these, 3,187 (82.6%) delivered at Mulago National referral hospital and were demonstrated to on how to administer NVP syrup to their infants. The challenges experienced were administering syrup at irregular times were 70 (1.3%), missed administering dose 34 (0.6%), misunderstood instructions 18 (0.3%), gave over/under dose 53 (1.0%) and other reasons 27 (0.5%). 672 (17.4 %) delivered from other health centers and 17 (1.5%) administered syrup at irregular times, 30 (2.7%) missed administering dose, 20 (1.8%) misunderstood instructions, 15 (1.3%) gave over/under dose and 18 (1.6%) had other reasons. The proportion of challenges in administering of NVP syrup to infants at home among those who delivered from other health centers was higher compared to those who delivered at the hospital ($p<0.001$).

Conclusion: Counseling at delivery coupled with NVP syrup administration demonstrations to HIV positive mothers who administer long term NVP syrup to their HIV exposed infants at home are effective in providing support to women who administer NVP syrup at home.

No conflict of interest

Abstract: P_29

Late Breaker

A Prospective Study of Hematological Changes after Switching from Stavudine to Zidovudine Based ART in HIV Infected Children

A. Hemal, A. Singh, S. Agarwal, N.K Dubey, G. Buxi

Background: Stavudine (d4T) has been commonly used in first line ART regimens in resource limited countries. Its long term use is associated with a high incidence of lipodystrophy and lactic acidosis. The 2010 WHO guidelines recommend Zidovudine (ZDV) to be used as first line drug therapy in ART. ZDV has been associated with hematologic toxicity, including neutropenia, leucopenia, and severe anemia. However, it is a better drug in long term management of HIV in children. The objective of this study was to determine the spectrum and severity of hematological changes after switching from d4T to ZDV in Indian children who have been on a d4T-containing regimen.

Methods: A prospective observational study was carried out in children aged 2- 18 years, who had received first line ART regimen consisting of d4T for at least 48 weeks; with hemoglobin of >9gm% and who were immunologically stable (CD4 count > 25% in children < 5 years of age and >500 cells/mm^3 in children >5 years of age). Children with hemoglobinopathies; those who had evidence of opportunistic infections and those on other

myelotoxic drugs like ganciclovir were excluded. Children were switched to ZDV and followed every 4 weeks for 48 weeks for changes in hemoglobin, total leucocyte count, absolute neutrophil count, platelet counts and CD4 counts. Data was analyzed using statistical package Stata version 11.0. Continuous variables were compared between the groups using either independent Student's t-test or Wilcoxon rank-sum test. Nominal categorical data was compared using Chi-squared test or Fisher's exact test as appropriate. The p value of <0.05 was considered statistically significant.

Results: Of the 70 children enrolled, 60 completed the required follow up of 48 weeks. 38 (63.3%) children were males. The mean age was 11.2 ±3.7 years. 45(75%) children showed a significant drop in hemoglobin (>1g/dl) with an absolute fall of 2g/dl (IQR 1.5, 3). The drop was significant (p<0.05) in children 2 to 15 years of age at and in males (p<0.005). Majority developed grade1 anemia [14(31%)]. Only 3(6%) developed grade 4 anemia. The lowest hemoglobin recorded was at 12 weeks in 31% and 16 weeks in 20% patients. All the children recovered from anemia at the end of 44 weeks with maximum [15 (33.3%)] recovering at 28 to 36 weeks in children. The drop in Total Leucocyte Count was significant in children aged 2 to 5years. The Absolute Neutrophil Count dropped from 5067 (SD 1392) cells/mm^3 to 3625 (IQR 2800, 4800) cells/mm^3 (p=0.004). No child developed grade 3 or grade 4 neutropenia. There was no significant change in platelet count and CD4 count in any age group.

Conclusion: ZDV produces significant reduction in hemoglobin, TLC and ANC. However, incidence of severe drug toxicity is low. Majority of children recovered without intervention. Therefore, drug toxicity should not preclude its routine use in poor countries. Monitoring for symptoms of anemia and opportunistic infections with regular follow up can help in early detection of drug induced toxicities.

No conflict of interest

Abstract: P_30

Prevention of Mother-to-Child transmission

Factors associated with HIV infection among infants enrolled in an urban slum setting in Nairobi, Kenya: Implications for elimination of pediatric HIV

A. Katana[1], I. Waithera[2], J. Motoku[2], V. Maina[2], A. Njoroge[2], L. Nganga[1]

[1]Centres for Disease Control and Prevention, Division of Global HIV/AIDS, Nairobi, Kenya; [2]Eastern Deanery AIDS Relief Program, HIV/AIDS, Nairobi, Kenya

Background: In Kenya, 10% of the HIV-exposed infants (HEI) who receive a DNA polymerase chain reaction (PCR) test are HIV infected, much higher than the global elimination target of <5%, mainly because of sub-optimal coverage with interventions for HIV prevention of mother to child transmission (PMTCT). Eastern Deanery AIDS Relief Program (EDARP) provides antiretroviral drugs (ARV) for PMTCT to antenatal, postnatal women and their infants in the Eastern Slums of Nairobi as per national guidelines. We assessed factors associated with HIV infection among HEI in the EDARP program.

Materials & methods: We retrospectively reviewed medical records of HEI aged ≤24 months enrolled in EDARP between October 1, 2011 and September 30, 2012.Two categories of HEI were identified; those whose mothers enrolled during pregnancy (antenatal) and received ARV prophylaxis and HEI whose mothers enrolled after delivery (postnatal). ARV prophylaxis refers to women who received triple ARV or Zidovudine and Nevirapine. Infant HIV status was confirmed by DNA PCR for <18 months and antibody test for > 18 months. Bivariate analyses were used to determine the relationship between infant HIV infection and use of ARVs for PMTCT and timing of enrolment of HIV-infected mothers and HEI into care. Odds ratios (OR) and 95% confidence intervals (CI) are reported.

Results: Overall 1192 HEI were enrolled, 1140 (95.4%) received confirmatory HIV diagnosis

[1064 (93.3%) by DNA PCR, 76 (6.7%) by antibody test]. HEI born to mothers who enrolled in PMTCT antenatally were 794 and ARV coverage was 94% compared to 36% for the 398 mothers who enrolled during postnatal period. HEI median age at enrollment into care was 15 days (IQR 8 - 42) for mothers who enrolled antenatal and 125 days (IQR 26 – 361) for mothers who enrolled during postnatal period. Overall, 86 (7.2%) of the HEI tested HIV positive; 13(1.6%) born to mothers who enrolled antenatal and 73(18.3%) born to mothers who enrolled during postnatal period. Postnatal PMTCT enrolment (OR 12.6 95% CI: 7.1, 22.3), no maternal use of ARV for PMTCT (OR 16.1, 95% CI: 9.4, 27.5) and late enrolment of the HEI (OR 15.5, 95% CI: 6.2, 38.8) were associated with increased risk of infant HIV infection.

Conclusions: Postnatal enrollment of HIV-infected mothers, failure to use maternal ARV for PMTCT and late HEI enrolment into care were associated with high risk of infant HIV. These missed opportunities need to be addressed in order to optimize ARV use and achieve the elimination target.

No conflict of interest

Abstract: P_31

Prevention of Mother-to-Child transmission

Uptake of Prevention of Mother to Child Transmission of HIV Services: Results from a HIV Exposed Infant Cohort Analysis Pilot, Nyanza, Western Kenya

B. Ochanda[1], M. Schmitz[1], F. Miruka[1], D. Soti[2], C. Samo[2], E. Oweya[3], H. Muttai[1]

[1]CDC - DGHA, Care and Treatment, Kisumu, Kenya; [2]Ministry of Health, Nascop, Nairobi, Kenya; [3]CDC - DGHA, Epidemilogy Surveilance & Informatics, Kisumu, Kenya

Background: Despite scale up of Prevention of Mother to Child Transmission of HIV (PMTCT) services, about 8% of HIV-Exposed Infants (HEI) in Kenya (~10% in Nyanza Province) still acquire HIV infection. To identify challenges in PMTCT service delivery, we describe uptake of services among HEI in Nyanza Province.

Materials & methods: Based on facility longitudinal HEI registers, a HEI cohort analysis tool assessing service uptake for infants attaining 9 and 18 months of age was piloted in 13 health facilities in Nyanza Province. Between March and September 2012, 9 month outcomes were assessed of children born March-September 2011 and 18 month outcomes of children born June-December 2010. Monthly reports were submitted through the district system and aggregated at provincial level. PMTCT guidelines recommend use of maternal and infant antiretroviral drugs (ARVs); polymerase chain reaction (PCR) HIV testing for infants at 6 weeks or first contact between 0-9 months; HIV antibody testing at 9 months with confirmatory PCR testing for those testing HIV antibody positive before 18 months; HIV antibody testing at 18 months; and linkage to HIV care for those identified HIV positive; with the Provincial Team targeting ≥80% uptake of these services.

Results: Among 1,250 infants attaining 9 months, 1,042 (83%) documented maternal and 1,051 (84%) infant ARV use. In total, 1,170 (94%) infants received HIV testing between 0-9 months, of whom 82% were tested by age 2 months. Of 90 infants who tested HIV-positive, 66 (73%) were linked to HIV care. Among 954 infants attaining 18 months, 816 (86%) were eligible for 9-month HIV antibody testing and 569 (70%) were tested. Of 142 testing antibody positive between 9-18 months, 38 (27%) received confirmatory PCR testing. Among773 infants eligible for 18-month HIV antibody testing, 55% were tested for HIV infection. Of 106 children testing HIV-positive between 0-18 months, 59 (56%) were linked to HIV care.

Conclusion: While maternal/infant ARV coverage and 6-week PCR testing met provincial targets; 9 and 18-month testing and linkage to care for HIV-positive infants were suboptimal. The Provincial Team aims to rollout HEI cohort analysis across Nyanza province to continue informing PMTCT program improvement efforts while discussions are underway for national adoption.

No conflict of interest

Abstract: P_32

Prevention of Mother-to-Child transmission

Monitoring of Prevention of Mother to Child Transmission uptake through maternity register review in Nyangabgwe hospital Francistown, 2003-2012

K. Legwaila[1], C. Motswere-Chirwa[1], S. Matambo[1], T. Kolobe[1], J. William[1], M. Glenshaw[1], L. Lu[2], V. Letsholathebe[3], K. Keapoletswe[3]

[1]Centers for Desease Control Botswana, Global Aids Program / PMTCT office, Gaborone, Botswana; [2]Centers for Desease Control -Atlanta, Global Aids Program-Atlanta, Atlanta, USA; [3]Ministry of Health, HIV Prevention and Care, Gaborone, Botswana

Background: The Botswana Prevention of Mother to Child Transmission (PMTCT) program has demonstrated success in reducing mother to child transmission of HIV from 35% without interventions to 3% in 2012. Core interventions of the program available at no cost to all Batswana citizens include routine provider-initiated HIV testing at antenatal care (ANC), the provision of antiretroviral drugs (ARV), and free infant formula. Monthly national reporting describes the progress of the program, but is not sensitive enough to provide feedback useful to improve service delivery at the local level.

Materials & methods: Data on PMTCT interventions received by all women delivering at Nyangabgwe Referral Hospital (NRH), the second-largest hospital maternity ward in Botswana, from 2003 to 2012 were collected from maternity registers on a daily basis. The following variables were routinely abstracted: number of women who were HIV-positive, provision of zidovudine (AZT) or HAART during ANC, babies given AZT and/or nevirapine (NVP), and method of infant feeding at birth (breast or formula feeding).

Results: A total of 46,354 women delivered at NRH from 2003-2012; 15,277 (33%) were HIV-positive, 27,090 (58%) were HIV-negative, and 3,987 (9%) were not tested. The percentage of women who presented to maternity at NRH with a known HIV status increased from 54% in 2003 to 94% in 2012. PMTCT uptake for women on any ARV increased from 33% in 2003 to 84% in 2012. The proportion of women who received ARV for more than 4 weeks increased from 14% to 74%. The percentage of women given HAART increased from 1% to 44%. Babies given AZT and NVP prophylaxis at birth increased from 40% to 84%. Formula fed babies increased from 48% to 80%.

Conclusions: Routine, systematic, and timely data review and monitoring of maternity registers demonstrated significant improvement in the uptake of PMTCT interventions in the catchment area of Botswana's second-largest maternity hospital from 2003-2012. Routine data monitoring and reporting are strongly recommended to document programmatic progress, provide feedback on program quality, and guide strategic program planning.

No conflict of interest

Abstract: P_33

Prevention of Mother-to-Child transmission

Characteristics and outcomes of HIV-exposed infants at the Baylor Centre of Excellence (COE) in Mbeya, Tanzania

T. Jacob[1], E. White[1], J. Bacha[1], B. Anosike[1], A. Chistopher[1], L. Campbell[1], A. Nyanga[1], B. Mayalla[1], B. Kasambala[1], C. Moses[1], S. Kisiombe[2], J. Bisimba[3], M. Tolle[4]

[1]Baylor College of Medicine Children's Foundation - Tanzania, Pediatrics, Mbeya, Tanzania; [2]Meta Hospital, Ob-Gyn / Pediatrics, Mbeya, Tanzania; [3]United States Agency for International Development - Tanzania, HIV/AIDS, Dar es Salaam, Tanzania; [4]Baylor College of Medicine Children's Foundation - Tanzania, Pediatrics, Mwanza, Tanzania

Background: More than 90% of HIV-infected children in our setting acquired infection perinatally. While prevention of mother-to-child

HIV transmission (PMTCT) rates are decreasing in Tanzania and similar settings with the scale-up of PMTCT programmes, access to PMTCT is far from universal. There is little data on the rate of MTCT in Tanzania in routine clinical settings, and little data on cohorts of HIV-exposed infants (HEI) in programmatic settings. This study explored the characteristics of HEI and evaluated MTCT rates and other clinical outcomes in HEI at the COE in Mbeya.

Materials & Methods: Retrospective cohort study of records from 1st Feb 2011 to Jan 31st 2013 at the COE. Inclusion criteria: infants age<18mo enrolled as 'exposed infant' between Feb 2011-Jan 2013. Baseline data collected at enrolment: age, gender, PMTCT recorded, breastfeeding (BF) status. Outcomes collected: Dried blood spot (DBS - HIV DNA PCR) results, lost-to-follow-up (LTFU) status, transferred-out status, time from enrolment to ART initiation, ART regimen.

Results: For 772 HEI, mean age-at-enrollment=4.3 months (range 0.03-17.9months). At enrolment, 35%(270/772) HEI reported having received as infant PMTCT either sd-NVP, 6 weeks daily NVP if mother on antiretroviral treatment (ART), or extended NVP while breastfeeding if mother not on ART; 8%(63/772) reported not having received NVP; and 57%(439/772) had no infant PMTCT data recorded. Maternal PMTCT interventions were not well-recorded in this sample. Total MTCT rate in this period was 19%(144 DBS-positive infants/772 total HEI).
For 144 confirmed HIV-infected, mean age at enrolment as HEI was 8.1 months (range 0.9 – 13.3 months), 56% females (81/144). BF status at HEI enrolment: 20% exclusive breastfeeding (29/144), 32% mixed feeding (46/144), 24% had stopped breastfeeding (34/144), and 24% had no BF information (35/144). MTCT rate for those with history of infant PMTCT=10%(28/270), while for those reporting no infant PMTCT, rate=54%(34/63). ART initiated in 119(83%) of confirmed HIV-infected [median age=7.5 months, mean time from enrollment to ART initiation=7 weeks]. 2%(2/119) were initiated on ritonavir-boosted lopinavir (LPV/r)-based regimen, 73%(87/119) on AZT-3TC-NVP and 25%(30/119) on D4T-3TC-NVP regimens. All HIV-infected infants initiated on ART with exposure NVP were started on NVP-based regimen based on national ART guidelines. 10%(15/144) of the HIV-infected died and 18%(26/144) were LTFU. Of the remaining 628 HEIs with initial negative DBS, 3% (18/628) died, 1% (8/628) were lost to follow up, 20% (127/628) were followed to confirmation of definitive HIV-negative status, and 76% (475/628) are active HEIs in continuing follow-up. 5 patients (1%) initially had negative DNA PCR and later seroconverted.

Conclusions. NVP-based PMTCT interventions for infants are effective in reducing rates of MTCT in our setting, and delay in linkage of HEIs to care is associated with MTCT – reinforcing these messages at decentralized sites scaling up PMTCT should be prioritized. LTFU is a challenge in caring for HEI cohorts, and strategies are needed to address HEI retention in care. While with early HIV diagnosis and ART initiation good infant outcomes are possible in our setting, comprehensive PMTCT and HEI services in our catchment area require further scale-up and strengthening.

No conflict of interest

Abstract: P_34

Prevention of Mother-to-Child transmission

Antiretroviral prophylaxis among HIV-exposed infants in Mozambique: high rates of initiation and adherence but low rates of early infant diagnosis.

H. Nuwagaba-Biribonwoha[1], F. Tsiouris[1], I. Yersin[1], L. Chongo[2], Y. Zhang[3], E.J. Abrams[1]

[1]ICAP Columbia University, Mailman School of Public Health, NewYork, USA; [2]Ministry of Health, Public Health, Maputo, Mozambique; [3]Department of Biostatistics, Mailman School of Public Health, NewYork, USA

Background: The risk of mother-to-child HIV transmission (MTCT) is significantly reduced by maternal antiretroviral (ARV) prophylaxis and treatment (ART), and infant ARV prophylaxis. We assessed infant ARV prophylaxis initiation among HIV-exposed infants (HEIs) in Mozambique. National

recommendations during the study period were single-dose nevirapine (sd-NVP) at delivery and daily zidovudine (ZDV) up to 4 weeks post partum, and from July 2011, daily NVP for the duration of breastfeeding. Sd-NVP only was given if no other prophylactic regimens were available.

Materials & methods: Data were collected on HEIs of 1140 HIV-infected pregnant women enrolled into a prospective observational cohort study from 10 PMTCT clinics in Maputo and Nampula between Oct2010 and Jan2012. HEI ARV initiation and adherence data were obtained from clinic based interviews with mothers at months 1 (1-5 weeks) and 3-4 postpartum (M1 and M3 respectively). Interviews were conducted during home visits or by phone if mothers missed clinic visits. We present descriptive results of HEI ARV initiation (maternal report or clinic record) and ARV adherence (maternal report of HEI taking 100% of prescribed doses in the 3 days preceding the M1 interview). For HEIs that attended the at risk child consultation (ARCC) at the study clinic, we abstracted data about HIV testing from clinic records.

Results: A total of 984 HEIs were recorded in the post-partum period, including 11 sets of twins: 57% from Maputo, 82% born after June 2011. Mothers of 645(66%) HEIs attended the M1 interview; mothers of 326(33%) HEIs were assessed at M3 only (missed the M1 interview); and for 13(1%) HEIs, data were obtained from ARCC clinic records only (missed both M1 and M3 interviews). A total of 837(85%) initiated ARVs: 590(60%) daily NVP, 217(22%) daily ZDV (61 also received sd-NVP); and 30(3%) sd-NVP only. Mothers of 656(67%) HEIs reported taking ZDV during pregnancy (412(63%) HEIs took daily NVP and 137(21%) ZDV); and mothers of 213(22%) took ART (125(59%) HEIs took daily NVP and 57(27%) ZDV). Among the 115 HEIs whose mothers did not take ARVs, 35(30%) did not get any ARVs either.
Of the 645 HEIs whose mothers completed M1 interviews, 417(65%) initiated daily NVP and 168(26%) ZDV, and 410(98%) and 88(52%) respectively were still on these medications at the M1 interview. Overall reported HEI ARV adherence at M1 was 96%; 97% for daily NVP and 92% for ZDV.
A total of 586/984(60%) HEIs had ARCC clinic records at study clinics. DNA PCR testing was done for 354(60%) of those who attended the study clinics (36% of all HEIs); and of those tested there were 20(6%) positive, 333(94%) negative and 1 indeterminate.

Conclusion: The high rates of reported initiation and adherence to infant prophylaxis reflect early success in moving from the Sd-NVP only to more prolonged infant ARV prophylaxis. However, two of every five HEIs didn't return to the study ARCC clinics and fewer still received early infant diagnostic testing. Results reflect the urgent need to strengthen follow-up of HIV-exposed infants.

No conflict of interest

Abstract: P_35

Prevention of Mother-to-Child transmission

Prevalence of and risk factors for perinatal depression among HIV-positive women in Ukraine

H. Bailey[1], R. Malyuta[2], C.L. Townsend[1], M. Cortina-Borja[1], C. Thorne[1]

[1]University College London, UCL Institute of Child Health, London, United Kingdom; [2]Perinatal Prevention of AIDS Initiative, Perinatal Prevention of AIDS Initiative, Odessa, Ukraine

Background: Ukraine's HIV epidemic is the most severe in Europe and is increasingly affecting women. Prevalence of depression is also higher in Ukraine than in other European countries. Maternal depression among HIV-positive women has implications for infant outcomes including prevention of mother-to-child transmission (PMTCT), due to its potentially negative impact on uptake of and adherence to interventions. However, depression screening is not part of HIV care in Ukraine, and psychiatric care is highly stigmatised. Little is known about burden of perinatal depression among HIV-positive women.

Materials & methods: Anonymised surveys nested within the Ukraine European Collaborative Study were conducted i) at delivery and ii) in the first year postpartum

(median 5.6 months). Depressive symptoms during the preceding month were assessed using the 'Patient Health Questionnaire-2' questions on anhedonia and low mood and, if either was positive, a question on whether help was desired; depression was defined as a positive response to ≥2 of the 3 questions. Self-efficacy was assessed using the HIV Treatment Adherence Self-Efficacy Scale (adapted). Characteristics of women with and without depression were compared using the Fisher's exact test.

Results: Of 180 antenatal and 228 postnatal survey respondents, median age was 28.0 years, 19% (77/396) were single and 12% (44/378) reported an illicit drug use history. All antenatal respondents had taken antiretroviral therapy (ART) for ≥4 weeks before delivery and 44% (101/228) of postnatal respondents were currently on ART; the proportions reporting being somewhat/terribly bothered by side effects were 25% (43/172) and 23% (23/99) respectively. The proportions with 'low' ART-related self-efficacy (i.e. unable to do ≥1 of five activities related to integration of ART into daily life) were 20% (28/138) antenatally and 17% (11/66) postnatally. Anhedonia was reported by 16% (28/180) antenatally and 20% (46/228) postnatally, and low mood by 34% (61/180) and 30% (69/228); of women reporting one/both symptoms, 63% (39/62) antenatally and 64% (45/70) postnatally reported wanting help. One quarter of respondents were classified as depressed (49/180 antenatally; 57/228 postnatally). Depression was more common among women living alone (58% (7/12) vs. 25% (42/167) living with others, p=0.02), those somewhat/terribly bothered by ART side effects (40% (17/43) vs. 23% (30/129) not bothered/only slightly, p=0.03), those unsure of the effectiveness of ART for PMTCT (56% (5/9) vs. 25% (43/169) completely/fairly sure of effectiveness, p=0.06) and those with low self-efficacy (43% (12/28) vs. 23% (15/110) with higher self-efficacy, p=0.03). Postnatally, single women were at increased risk of depression (44% (20/45) vs. 20% (37/183) of married/cohabiting, p<0.01), as were those unsure of the effectiveness of neonatal prophylaxis for PMTCT (40% (25/63) vs. 18% (28/154) who were sure, p<0.01) and, among women on ART, those unable to ask for support with medication (48% (11/23) vs. 22% (14/63), p=0.02).

Conclusions: In this study, one in four HIV-positive childbearing women were classified as depressed, highlighting an urgent need for strategies to identify and support affected women. Those with poor social support or low ART-related self-efficacy were at particularly high risk of depression. Results indicate a need to strengthen counselling around perinatal use of ART.

No conflict of interest

Abstract: P_36

Prevention of Mother-to-Child transmission

Rwanda, will achieve virtual elimination of Mother-to-Child HIV transmission by 2015

E. Remera[1], P. Ndimubanzi[2], A. Tuyishime[3]

[1]Rwanda Biomedical Center/National AIDS Control Commission, Biostatistics, Kigali, Rwanda; [2]Center for disease control Rwanda, Disease prevention specialists, Kigali, Rwanda; [3]Rwanda Biomedical Center, Planning Unit, Kigali, Rwanda

Background: In early 2009, the Joint United Nations Program on HIV/AIDS (UNAIDS) first called for the 'virtual elimination' of mother-to-child transmission of HIV (EMTCT). Since then, there has been increased global advocacy, commitment as well as funding and implementation support for elimination. The global EMTCT includes an overarching goal of reducing the number of new pediatric HIV infections by 90% and reducing MTCT below 5% by 2015. Over the years, Rwanda has consistently made remarkable strides in increasing the coverage of health facilities providing PMTCT, the number of pregnant women attending as early as the first trimester of pregnancy ante natal care services and impressive male uptake of PMTCT program. In addition, since early 2010, Rwanda has adopted option B and then option B+ in an effort to achieve less than 2% HIV mother-to child-transmission.
Mathematical models may be used to project transmission rate and evaluate whether the country is on the right track to achieve the target in the best case scenario.

Materials & methods: Using actual programmatic data from the web based, TRACnet system which aggregates national data, and inputs that take into consideration various surveys, surveillance and demographic data, we used spectrum version 4.5.7, to develop a model that projects and estimates, new child HIV infections and transmission rates over the yearsfrom 2009 to 2015. It is important to note that more and more women will have started antiretroviral therapy before the current pregnancy which represents a shift from what happened in the past.

Results: Using spectrum software, the coverage of pregnant women receiving PMTCTservices is estimated to increase from 82.5% in 2009 to 95.0% in 2015. New HIV infections due to mother-to-child transmission will decrease from 1634 in 2009 to 364 in 2015. Therefore, there will be a decrease of the HIV MTC transmission rate at 6 weeks from 5.91% in 2009 to 2.01% in 2015. The same, the final mother to Child transmission rate including breastfeeding period is estimated to decrease from 18.12% in 2009 to 4.76 % in 2015.

Conclusion: If Rwanda PMTCT program sustains its efforts and manages to provide universal coverage with treatment for pregnant women in need of treatment the global target of reducing mother-to-child transmission is achievable.

No conflict of interest

Abstract: P_37

Implementation research on PMTCT and pediatric treatment programs

How we scaled up pediatric HIV services to lower health centers in the rural eastern Uganda: a case study of 12 districts

E. Namusoke Magongo[1], N. Lukoda[2], D. Akurut[2], M. Arinaitwe[2], E. Ssemafumu[2], E. Schouten[3]

[1]Ministry of Health, STI/AIDS Control Program(ACP), Kampala, Uganda; [2]Management Sciences for Health, STAR-E Project, Mbale, Uganda; [3]Management Sciences for Health, Centre for Health Services, Lilongwe, Malawi

Background: In 2009, ART(Anti Retro-viral Therapy) was provided at only hospitals and health center (HC) IVs in Uganda leaving out the health center III's that are the majority and closer to the people. It is known that most of the HIV testing occurs at HC III's. HC III's have the same number of children testing positive as ART sites and these children do not make it to the ART sites where they are referred. The purpose of this study was to scale up pediatric HIV services to HC III's in order to reduce on missed opportunities for ART.

Materials & Methods: The study took place at 141 health center III's in 12 districts of eastern Uganda from March 2009- December 2012. HIV services in these districts are supported by STAR-E (Strengthening TB/AIDS Responses in Eastern Uganda) Project, a PEPFAR/USAID funded project lead by Management Sciences for Health. This was an interventional and observational study that makes use of operational research, the 12 districts being a case study. The interventions included: 1) Capacity building through trainings, integrated mentorship and support supervision visits 2) Testing: Know Your Child Status campaigns, Provider Initiated Testing and Counseling (PITC), proactive identification of HIV exposed infants, using index clients who test positive to test all family members; we subcontracted another organization to do community testing, using events like 'World AIDS Day'. 3) Linkages: linkage facilitators were used to escort children and their caretakers from one care point at the facility to another, integration of services like the TB and ART clinics at one point and the immunization services with EID (Early Infant Diagnosis) and post-natal services, use of triplicate forms from the entry point of care upon testing positive to the point of referral. The white form was given to the caretaker, a pink copy was taken by the referring health worker to the point of referral and the yellow one stayed at the referring entry point 4) Retention: use of the appointment book to track missed appointments with immediate follow up, expert clients and PBF's (Performance based Funds) awardees to follow up lost children. Facility records were used to collect data. Data was analyzed using SPSS.

Results: 167,316 children above 18 months have been reached with HCT, 1634 tested positive. Over 80% of the children who were tested and those who turned positive were identified at the health facility with few of them identified through the community testing. 3527 HIV exposed infants have received a DNAP PCR test and 159 tested positive, 2189 HIV exposed infants have received cotrimoxazole prophylaxis. All the children who tested positive were linked to care and 1286 children are currently receiving ART.

Conclusions: Scaling up pediatric HIV services to lower level health facilities is possible and reduces missed opportunities for ART. However, in order to ensure a good quality of service, regular mentorship of health workers is critical especially in the first year the health unit begins providing ART. Loss to follow up of children enrolled in care remains a challenge.

No conflict of interest

Abstract: P_38

Implementation research on PMTCT and pediatric treatment programs

Outcomes of HIV-infected children < 2 years of age presenting to public HIV clinics in Kenya; 2004-2010: a national retrospective cohort study

B. Ng'eno[1], L. Nganga[1], S. Modi[2], A. Gichangi[1], A. Waruru[1], A. Katana[1], I. Mukui[3], J. Wamicwe[3], I. Inwani[4]

[1]U.S. Centers for Disease Control and Prevention, Division of Global HIV/AIDS, Nairobi, Kenya; [2]U.S. Centers for Disease Control and Prevention, Division of Global HIV/AIDS, Atlanta, USA; [3]Ministry of Public Health and Sanitation, National AIDs and STI Control Programme (NASCOP), Nairobi, Kenya; [4]Kenyatta National Hospital (KNH), Pediatrics and Child Health, Nairobi, Kenya

Background: Due to evidence of poor outcomes for HIV-infected children who do not receive early antiretroviral treatment (ART), the Government of Kenya has prioritized diagnosis and treatment for HIV-infected children aged < 2 years. We assessed the timing of HIV diagnosis, ART initiation, retention and death among HIV-infected children aged < 2 years presenting to Kenya's public HIV clinics.

Materials & methods: We conducted a retrospective cohort study of HIV infected children enrolled into HIV care aged < 2 years between November 1, 2004 and March 31, 2010 in 50 randomly selected public health care facilities in Kenya. We abstracted demographic and clinical information from routine medical records. We used non-parametric test for trend to assess declining or increasing trends, Kaplan Meier to compare retention for ART and non-ART groups, chi-square test to compare proportions and cox proportional hazards models to assess predictors of mortality.

Results: During the study period, 3,214 children aged < 2years (50.7% female) were confirmed to be HIV-infected (69% by DNA polymerase chain reaction (PCR) test for children < 18 months and 31% by antibody test among children aged ≥ 18 months). The median follow-up time was 25.6 months (interquartile range 4.9-44.8 months). There was a trend in reduction of both age at diagnosis from 19.9 months in 2004 to 11.2 months in 2010 ($p<0.0001$) and age at ART initiation from 22.7 months in 2004 to 13.2 months in 2010 ($p<0.0001$). There was a trend in reduction of median time from HIV diagnosis to ART initiation from 1.7 months in 2004 to 0.8 months in 2010 ($p<0.001$). Overall, 2,296 (71.4%) children remained in care and 232 (7.2%) children died. Children who were not on ART were less likely to remain in care (61.7% vs. 76.1%, $p<0.0001$) compared to those on ART. Age <1year at diagnosis ($p<0.001$), CD4<15% ($p<0.001$) and not being on ART ($p<0.0001$) were associated with increased risk of death.

Conclusions: Although the age at diagnosis for HIV-infected children < 2 years of age has improved over time, it remains delayed. Similarly, the time from HIV diagnosis to ART initiation has significantly improved over time but still remains suboptimal. Our data confirm previous research showing that mortality is much higher among severely immunosuppressed infants and children and among those not on ART. On the other hand retention is better for those infants and children who are on ART. Additional efforts are needed

to diagnose HIV infection early and promptly initiate ART to ensure long-term survival in this vulnerable population.

No conflict of interest

Abstract: P_39

Implementation research on PMTCT and pediatric treatment programs

Quality Assurance in PMTCT-Francistown, Botswana, 2008-2012

S. Matambo[1], T. Kolobe[1], K. Legwaila[1], V. Letsholathebe[2], E. Machakaire[3], L. Lu[4], D. Voetsch[5], E. Dintwa[6], M. Maruping[7], M. Glenshaw[8], C. Motswere-Chirwa[1]

[1]CDC Botswana, PMTCT, Francistown, Botswana; [2]Ministry of Health, PMTCT, Francistown, Botswana; [3]CDC Botswana, PMTCT, Gaborone, Botswana; [4]CDC Atlanta, PMTCT, Atlanta, USA; [5]CDC Botswana, Strategic Information, Gaborone, Botswana; [6]Ministry of Health, PMTCT, Gaborone, Botswana; [7]CDC Botswana, Laboratory, Gaborone, Botswana; [8]CDC Botswana, Prevention, Gaborone, Botswana

Background: Prevention of Mother To Child Transmission (PMTCT) services are available in all health facilities providing antenatal care (ANC) in Botswana. Nationally over 95% of pregnant women register for ANC. HIV testing is offered at the initial and third trimester ANC visits or during labor if missed previously. HIV-positive women are initiated on a PMTCT antiretroviral regimen depending on CD4 count and gestational age at ANC registration. We report the effect of clinic audits and rapid feedback to the PMTCT program on the uptake of these services.

Materials & Methods: Data for all women attending ANC and postnatal clinics were collected monthly from PMTCT registers in 14 clinics and 1 health post in Francistown, the second largest city in Botswana, which has a population of 100,079. Clinic audits were conducted from 2008 through 2012. Immediate feedback was given to the nurse in charge and the PMTCT focal person after each audit.

Results: There was a total of 19,720 new ANC visits (range: 3,653 – 4,223 annually) from 2008-2012. HIV prevalence among women attending ANC during the 5-year period was 35%; prevalence was 32% in 2008, peaked at 39% in 2010, and declined to 33% in 2012. HIV testing at ANC increased from 91% in 2008 to 98% in 2012. The percentage of HIV-positive women who initiated a PMTCT regimen increased from 52% (29% AZT and 23% HAART) in 2008 to 74% (11% AZT and 63% HAART) in 2012. Testing among HIV-exposed infants increased from 76% in 2008 to 82% in 2012. Mother To Child Transmission (MTCT) of HIV decreased from 2.6% in 2008 to 1.4% in 2012.

Conclusions: Audit results from health care facilities over a 5-year period in an urban setting showed steady improvement in the cascade of PMTCT interventions. Clinic audits were a useful tool to provide immediate and contextual-specific feedback to PMTCT providers. Audits should be implemented nationally to monitor quality assurance and PMTCT uptake. Botswana has already achieved the MTCT rate recommended in the 2015 Millennium Goals of <5% and is heading toward an HIV-free generation.

No conflict of interest

Abstract: P_40

Implementation research on PMTCT and pediatric treatment programs

Trends in Retention and ART Initiation Among Children Enrolled in ICAP-Supported HIV Care and Treatment Programs in Mozambique (2006-2011)

C.A. Teasdale[1], M. Lahuerta[1], B. Thome[1], I. Yersin[1], L. Ahoua[1], H. Nuwagaba-Biribonwoha[1], E. Macassa[2], E.J. Abrams[1]

[1]ICAP, Columbia University, New York, USA; [2]Ministry of Health, Mozambique, Maputo, Mozambique

Background: Retention of HIV-infected children prior to initiation of antiretroviral therapy (ART) and timely ART initiation have been challenges for pediatric HIV programs in many resource limited settings. In order to improve survival and retention, the WHO recommended in 2010 that all children under the age of 2 years initiate ART at HIV diagnosis.

Materials & methods: We describe trends in retention prior to ART initiation (pre-ART retention) and proportions of children initiating treatment among all children 0-14 years enrolled in HIV care at 52 ICAP-supported facilities in five provinces of Mozambique between January 2006 and June 2011. LTF was defined as not attending clinic in the last 12 months. Cumulative incidence of pre-ART LTF at 12 months after enrollment was calculated accounting for the competing risks of death and starting ART. Proportions of children initiating ART were calculated using the total number of children enrolled in each calendar year as the denominator and the number of children enrolled in the same year who started ART at any time after enrollment as the numerator. Comparisons of outcomes by year of enrollment were calculated using the log rank test for cumulative incidence and Cochran-Armitage trend tests for proportions.

Results: 15,413 children with a median age of 2 years [interquartile range (IQR) 1-5] were enrolled. Overall cumulative incidence of LTF at 12 months after enrollment was 38.4% (95% CI 37.7-39.2%). LTF of children prior to ART initiation declined over time; LTF at 12 months after enrollment among children enrolled in 2006 was 44.1% (95% CI 41.9-46.3%) compared to 30.7% (95%CI 28.2-33.3%) in children enrolled in 2011 (p=0.002). Overall, 7,107 (46.1%) children initiated ART at a median age of 2.5 years [IQR 1.2-6.2]. The proportion of children who initiated ART increased from 38.2% among those enrolled in 2006 to 55.7% in 2011 (p<0.0001). The proportion of children enrolled at <2 years who initiated ART also increased from 27.8% of children enrolled in 2006 to 52.3% of children enrolled in 2011 (p<0.0001).

Conclusions: In this large cohort of children enrolled in HIV care in Mozambique, LTF at 12 months after enrollment was high among children not yet on ART. Trends over time suggested greater retention in the pre-ART period and increasing proportions of enrolled children initiating ART. While ART initiation among children who enrolled in care at less than 2 years of age increased from 2006 to 2011, overall ART initiation among young children remained low in spite of changes to national treatment guidelines in line with WHO 2010 recommendations. Greater efforts are needed to start all children less than 2 years of age on treatment.

No conflict of interest

Abstract: P_41

Implementation research on PMTCT and pediatric treatment programs

Know Your Child's Status Testing Events: A targeted strategy for paediatric HIV case identification in the Lake Zone of Tanzania

S. Shea[1], R. Mushi[1], S. Makungu[1], I. Sultan[1], M. Minde[1], B. Anosike[2], J. Sanders[1], J. Bisimba[3], L. Mwita[1], M. Tolle[1]

[1]Baylor College of Medicine Children's Foundation - Tanzania, Pediatrics, Mwanza, Tanzania; [2]Baylor College of Medicine Children's Foundation - Tanzania, Pediatrics, Mbeya, Tanzania; [3]United States Agency for International Development - Tanzania, Pediatrics HIV, Dar es Salaam, Tanzania

Background: Essential to successfully scaling-up paediatric HIV care and treatment is the identification of HIV-exposed and –infected children. While approximately 230,000 children are currently living with HIV in Tanzania, most have yet to be identified, and there are likely more than 100,000 children in the country in need of antiretroviral treatment not currently receiving it. General community-wide testing events have yielded low numbers of new paediatric HIV cases. As the vast majority of paediatric HIV cases are perinatally transmitted, children of HIV-infected parents enrolled in HIV Care and Treatment Centres (CTCs) in Tanzania are at higher risk of HIV infection, and targeted testing of them has potential for higher yields and better cost-effectiveness than general testing strategies. This study explores the yields and cost-

effectiveness of the Baylor Children's Foundation-Tanzania's Know Your Child's Status Testing Events (KYCS) based at CTCs in the Lake Zone.

Materials & Methods: Retrospective review of all KYCS testing events at CTCs in the Lake Zone conducted between March 1, 2011-December 31, 2012. Data collected on testing day: gender, age, District of residence, test result. Additional information collected: type of center; center's Region; involvement of home-based care volunteers (HBCs) in sensitization pre-event; Baylor-sponsored community sensitization of leaders/influential people pre-event; past KYCS event conducted at site; overall costs for all KYCS-related events conducted in time period. Comparison was made to two non-CTC-based general testing events where the same data points were collected.

Results: KYCS events: 3,978 individuals tested [2,994 children;1,015 adults at 41 CTC-based events]. 108 children (3.61% of all children tested) and 120 adults (11.82% of all adults tested) were newly identified as HIV-infected and were enrolled at CTCs. 189 exposed infants (6.31% of all children tested) were identified and had DNA PCR tests sent on testing day. KYCS events cost approximately TSh4.3million. Mean cost/newly-identified HIV-infected child/HIV-exposed infant for whom DNA PCR was sent=TSh15,000 [approx.US$9]. Non-CTC-based general events: 346 individuals tested [209 children;137 adults]. 1 child (0.48% of all children tested) and 10 adults (7.3% of all adults tested) were newly identified as HIV infected. Regional KYCS results for % children either testing positive or having DNA PCR test sent were: Geita-17.98%, Kagera-7.95%, Kigoma-3.14%, Mara-10.86%, Mwanza-9.23%, Shinyanga-9.41%, and Tabora-33.33%.

Conclusions: KYCS testing events appear cost-effective in identifying HIV-infected/exposed children, and offer an additional benefit of linkage-to-care by their site-based nature. Adoption of this approach to the national scale-up strategy may help cost-effectively increase the number of children in care, a key programmatic goal. Effect of pre-event sensitization activities are of interest, although in this study no clear effect of sensitization was noted on patient turnout or testing yield; methodology yielding appropriate data particular to this question is in development. Assessing results by type of CTC (district hospital, health centre) is also of interest, and will help guide programme iterations. Given current systematic issues with DNA PCR testing at many sites (turnaround times, results notification to families, enrolment of HIV-infected infants into care), specific tracking mechanisms for DNA PCR testing during KYCS events should be implemented.

No conflict of interest

Abstract: P_42

Implementation research on PMTCT and pediatric treatment programs

Facility-based targeted approach to increase pediatric HIV case identification in the Southern Highlands Zone, Tanzania

B. Anosike[1], B. Mwambungu[1], A. Biseta[1], M. Kaswiza[1], M. Chodota[1], H. Draper[1], A. Garcia-Prats[1], J. Bisimba[2], J. Sewangi[3], B. Kasambala[1], M. Tolle[4]

[1]Baylor College of Medicine Children's Foundation - Tanzania, Pediatrics, Mbeya, Tanzania; [2]USAID - Tanzania, Pediatrics HIV, Dar es Salaam, Tanzania; [3]Ministry of Health and Social Welfare, Office of the RACC, Mbeya, Tanzania; [4]Baylor College of Medicine Children's Foundation - Tanzania, Pediatrics, Mwanza, Tanzania

Background: In Tanzania HIV-infected children remain underrepresented among enrollees at HIV Care-and-Treatment Centres (CTCs). The Tanzania National AIDS Control Programme (NACP) set a pediatric target of >20% of total enrolment in CTC and on antiretroviral therapy (ART), however children represent only 8% nationwide. Community testing events have typically shown low HIV case-identification yields and poor linkage into care. Given pediatric HIV's primarily perinatal nature in our setting, children of parents attending CTCs have higher baseline HIV risk than children tested in the community settings. In the Southern Highlands Zone (SHZ), the Baylor Children's Foundation-Tanzania has adopted the Know Your Child's Status (KYCS)/facility-based testing (FBT) approach

which targets HIV testing of CTC patients' children. This study evaluates FBT outcomes and cost-effectiveness as compared to conventional community testing.

Materials & Methods: Retrospective review of FBT events conducted at SHZ CTCs from 1November 2011—31December 2012 utilizing national HIV testing algorithms with trained health care workers (HCWs) and Home Based Community (HBC) workers from facilities. Same-day CTC enrolment/baseline laboratory investigations were performed for all newly identified HIV-infected/exposed patients. Data collected in national testing and CTC registers include: age, gender, HIV test and DNA PCR results, location, average costs for events.

Results: 25 FBT events: 4,110 tested [79% (3,236);42% male) children<15years of whom 2.3% (76/3236) were HIV-exposed infants (HEI) <18 months of age]. 3.7% (116/3160) were HIV-infected (non-HEIs); 10.5% (8/76) of HEIs with positive DNA PCR. Overall positive (non-HEIs + HEIs) = 3.8% (124/3236). Median age at presentation and of children newly HIV-infected=8 years. . Average cost-per-event was 355 USD. Cost for infected/exposed-with-PCR sent was 32 USD. By district within Mbeya Region [overall 3.8%], newly infected children identified either by rapid test or DNA PCR: Mbozi 5.3%, Chunya 2.3%, Mbeya Urban 5.2%, Ileje 3.9%, Mbarali 9.5%, Kyela 5.3%, Rungwe 2.9%. Overall in Njombe Region=5.9%.
2 non-FBT events: 5,387 tested [83.7% (4509); 47% male) children <15 years of whom 0.6% (28/4509) were HEIs]. 0.8% (36/4473) were newly HIV infected (non-HEIs); 17% of HEIs (5/28) with positive DNA PCR. Overall positive (non-HEIs + HEIs)= 0.9% (41/4509). Average cost per event was 2625 USD. Cost for infected/exposed-with-PCR sent was 67 USD.

Conclusions: In pursuit of improving pediatric case-finding efforts nationally, NACP should consider facility-based KYCS approaches at CTCs nationwide. These events cost-effectively identify HIV-infected and –exposed children at rates and costs considerably more favorable than conventional community-based testing. In identifying generally asymptomatic HIV-infected children, the facility-based KYCS approach compliments provider-initiated testing and counseling (PITC) strategies within health facilities, which identify symptomatic HIV-infected children. Training and sensitization of HCWs on FBT KYCS approaches can be combined with existing pre- and in-service training around PITC. Future studies are needed to evaluate outcomes including rates of pediatric enrolment into and retention in care; baseline characteristics and associations of cases identified via FBT KYCS approaches; additional comparative cost analyses of testing strategies; and operational aspects of FBT KYCS approaches as they go to scale.

No conflict of interest

Abstract: P_43

Implementation research on PMTCT and pediatric treatment programs

Implementing 2013 WHO Guidelines for Children: Ensuring Scale up of Effective Interventions

L.J. Nelson[1], M. Penazzato[2], L.M. Muhe[3], N. Shaffer[1], M. Vitoria[1], V. Habiyambere[1], M. Beusenberg[1], M. Doherty[1]

[1]World Health Organisation, HIV Department, Geneva, Switzerland; [2]Medical Research Council, Clinical Trial Unit, London, United Kingdom; [3]World Health Organisation, Child and Adolescent Health, Geneva, Switzerland

Background: Paediatric treatment coverage remains unacceptably low at 28% in 2011. The 2013 Consolidated ARV Guidelines recommend treatment for all children < 5 years of age and lopinavir/ritonavir (LPV/r) as first-line for children < 3 years of age regardless of PMTCT exposure; changes that are expected to increase the number of eligible children, the total expense for ARVs and the supply chain.

Materials & methods: We analyzed 2011-2013 Spectrum estimates for 21 of 22 Global Plan priority countries (excluding India), the WHO 2012 ARV Survey, and routine program data. Baseline Spectrum data from 2011 were projected to 2013 to calculate the total number of children < 3 years requiring treatment with LPV/r.

Results: Among 62 countries surveyed in 2012, the most common regimens contained

nevirapine (72.6%), AZT (59.2%), d4T (28.4%), efavirenz (15.0%) and abacavir (7.6%); 2.4% of children were receiving a protease inhibitor-based 1st line, nearly 100% of which was LPV/r. Only 5% of children received 2nd line. Among high burden countries, 12/16 report LPV/r as recommended 1st line for PMTCT-exposed infants. Assuming full uptake of current guidelines, revision will lead to 10,000-160,563 additional children to be started on LPV/r for the 10 highest burden countries.

Conclusions: Scale up of key interventions, including treatment with LPV/r will be required to achieve 2015 targets, given low PMTCT and paediatric treatment coverage and limited LPV/r use. The increase in absolute numbers may be modest to treat all children < 2 to <5 years, but represent an important policy change in key high burden countries where decentralization of services will ensure targets. Resources, planning and prioritization are needed to implement these new recommendations.

No conflict of interest

Table: Key findings from 10/21 High Burden Countries in Africa, 2011

Country	HIV-infected children <5y	PMTCT coverage (%)	% of Children Tested within 12 months	Paediatric ART coverage (%)
South Africa	222,783	>95	87	58
Nigeria	206,135	18	4	13
Mozambique	93,770	51	32	20
United Rep. of Tanzania	91,395	74	19	14
Uganda	85,023	50	11	21
Malawi	76,312	53	n/a	29
Kenya	74,828	67	69	31
Zambia	66,116	86	21	31

Abstract: P_44

Implementation research on PMTCT and pediatric treatment programs

Outcomes of children receiving antiretroviral treatment: a national evaluation of the quality of the pediatric program in Mozambique

P. Vaz[1], A. Auld[2], E. Macassa[3], C. Alfredo[4], R. Shiraisi[2], K. Jobarteh[4]

[1]Ariel Glaser Pediatric AIDS Foundation, Pediatrics, Maputo, Mozambique; [2]Center for Diseases Control, Division of Global AIDS Program, Atlanta, USA; [3]Eduardo Mondlane University, Pediatrics, Maputo, Mozambique; [4]Center for Diseases Control, Division of Global AIDS Program, Maputo, Mozambique

Background: Despite the effectiveness of pediatric antiretroviral therapy (pART), pART coverage in Sub-Saharan Africa was only 23% by December 2010. In 2009, about 91,000 children (<15 years old) were in need of ART and pART coverage was 19%. An evaluation was conducted to inform the national scale-up of pART in Mozambique.

Materials & Methods: A stratified, multi-stage cluster survey was conducted to select a nationally representative sample of medical records of children enrolled on ART in Mozambique during 2004-2010. Thirty-five health facilities were selected via probability proportional to size sampling. Records of children <15 years of age and on ART for ≥ 6 months at the time of data abstraction were randomly selected from selected health facilities (N = 1,054). Demographic and clinical characteristics of study participants were reviewed; key treatment outcome indicators including retention, median weight-for-age gain, median $CD4^+$ T-cell (CD4) percentage gain for children aged 0-5 and the median CD4 count gain for children aged 6-14 were assessed; factors associated with attrition were analyzed; and a review of clinician compliance with national ART program guidelines was conducted. A Cox proportional hazards regression model was used to evaluate demographic and clinical characteristics

associated with attrition (death, loss to follow-up, or stopping ART). Analyses were weighted and controlled for the complex design of the survey.

Results: Median age was 3.3 years (IQR 1.7-6.5) and 50.1% were female; 32.6% were < 2 years of age. Of the 675 patient files with PMTCT information recorded, 87.8% had no record of maternal exposure to ARVs. The median duration between enrollment into HIV care and ART initiation was 63 days. At ART enrollment, 91% of the children received a nevirapine-based regimen; 56% of children were severely immuno suppressed (CD4 <15%): the median CD4% in children <1 year, 1-<2 years and 2-<5 years was 15.2%, 14.0% and 13.2%. respectively, and among chidren 5-<10 years and 10<15 years, median CD4 counts were 301cell/mm^3 and 96 cell/mm^3; the median weight-for-age z (WAZ) score was -2.1; 13.4% of the children had previous tuberculosis (TB) and 77% had moderate anemia with a median hemoglobin of 9.5 g/dL (IQR 8.5-10.1). Retention on ART for all ages at 6, 12 and 24 months was 93%, 89% and 85% respectively. Lower ART retention rates of 87%, 76% and 66% were found in children <1 years at 6, 12 and 24 months respectively. Pre-ART counseling was evident in 91%; however, evidence of any TB screening was found in only 63% of patient files. Seventy nine percent of patients had adherence of between 80 and 100%. Age > 2years (p<0.001), anemia (p=0.010) and WAZ $\leq$ -2 (p=0.002) were significantly associated with attrition.

Conclusions: ART retention among children enrolled during 2004-2010 was very good, even during a time of rapid scale-up. Strategies to reduce malnutrition and anaemia among this population as well as improve ART retention among younger children are required. Clinician compliance to delivery of HIV care should be addressed.

No conflict of interest

Abstract: P_45

Implementation research on PMTCT and pediatric treatment programs

Strengthening Maternal and Child Health Systems critical for successful integration of PMTCT programs,lessons from rural Uganda.

P. mwebaze-Songa[1], M. Kahungu[1], J. Lubwama[1], I. Sebuliba[1], A. Kekitiinwa[1]

[1]Baylor College of Medicine Childrens Foundation-Uganda, Medical Programs, Kampala, Uganda

Background: The World Health Organisation recommends integration of Prevention of Mother to Child Transmission of HIV (PMTCT) services within existing Maternal and Newborn health (MNH) services as a sustainable mechanism of eliminating new paediatric HIV/AIDS by 2015. To achieve this, developing countries must address the existing fractured health systems. We share an early experience of the impact of health systems strengthening on a PMTCT program in rural Uganda.

Materials & methods: A USG funded MNH pilot project [Saving Mothers Giving Life] is being implemented in 3 rural districts with the aim of reducing maternal deaths by 50% in 1 year. Baseline showed high HIV prevalence (11%), low 4th Antenatal Visits (21%) and health facility deliveries (27%).Districts were supported to recruit, train and retain critical staff improving staffing norm (45% to 60%). 78 Maternities have been upgraded; MNH logistics and laboratory services have been strengthened. 2079 Village health teams were trained and equipped to carry out community mapping of pregnant women, mobilisation and access to health facilities improved though a transport voucher system.

Results: This is a before (Oct 2010-Sept 2011) and after (Oct 2011-Sept 2012) evaluation. Noted is a 35% increase (30576 vs 47052) in pregnant women newly enrolled into Antenatal Care, 100% receiving an HIV test; increase in 4 ANC attendance to 44% and health facility deliveries to 50%. HIV positivity was 10% (6% newly tested while 4 % known HIV +ve). 45% (vs 17%) and 74% (vs 70%) were assessed for and received Anti-retroviral therapy (ART) prophylaxis respectively. Furthermore, a 3 fold increase (334 vs 947) of HIV +ve women started on HAART while 4065 vs 3143 exposed infants received DNA PCR test with 4% HIV positivity, 1675 (vs 775) started on exclusive breastfeeding and , 2096

(vs 1390) started on septrin and 1378 (vs 605) on ART prophylaxis.

Conclusion: A Health Systems Strengthening Approach involving community mobilisation is critical if developing countries are to achieve accelerated scale up & integration of Prevention or Elimination of Mother to Child HIV Transmission health services.

No conflict of interest

Abstract: P_47

Comprehensive Pediatric HIV care

Baseline predictors of attrition and loss to follow-up among children and adolescents in a community home-based care HIV programme in Uganda

W. Massavon[1], R. Lundin[1], P. Costenaro[1], S. Nabachwa[2], M. Penazzato[1], J. Kayiwa[5], P.C. Namisi[2], R. Ingabire[2], J.K. Tumwine[3], G. Franceschetto[1], M.M. Nannyonga[2], E. Morelli[1], D. Bilardi[1], D. Kalibbala[2], A. Mazza[4], C. Giaquinto[1]

[1]University of Padova, Department of paediatrics, Padova, Italy; [2]Nsambya Hospital, Home Care Department, Kampala, Uganda
[3]Makerere University, Department of Child Health, Kampala, Uganda; [4]Santa Chiara Hospital, Department of paediatrics, Trento, Italy; [5]Joint Clinical Research Centre, Department of Statistics, Kampala, Uganda

Background: Human immunodeficiency virus (HIV) -infected infants and children are surviving into adulthood in many resource-limited settings because of antiretroviral therapy (ART) programmes. However, loss to follow-up (LTFU) of children and adolescents with HIV receiving ART remains a major challenge in these settings.

Materials & methods: We conducted a retrospective cohort analysis of attrition and LTFU and their predictors among children and adolescents participating in the Tukula Fenna HIV project. The project operates at the Home-Based Care department of Nsambya Hospital and four outreach clinics, located in Kampala and three surrounding districts in Uganda. It uses community home-based care approach to deliver HIV services and provides free ART and other medical treatment as necessary, nutritional support, psychosocial support, and home visits. Attrition was defined as LTFU and death combined, and LTFU included patients without contact for more than 6 months who had not died or transferred out of care. Multiple imputation by chained equations (MICE) was used with 20 iterations to estimate Cox proportional hazard regression models with missing data for some covariates. These models were used to identify predictors of LTFU and attrition among all patients in the cohort and among the subset of patients receiving ART.

Results: 1162 children and adolescents with confirmed positive HIV status were enrolled in the Tukula Fenna project between October 2003 and August 2012.
Over this period, 5.34% patients died, 31.84% were LTFU, and overall attrition was 37.18%. This resulted in overall incidence of death of 18 per 1000 person-years, of LTFU of 107 per 1000 person-years, and of attrition of 125 per 1000 person-years. Factors significantly associated with LTFU and attrition were lower body mass index (BMI) z-scores and absence of ART.

Conclusion: The baseline predictors of LTFU and attrition were having lower BMI-z-scores and not receiving ART. Every effort should be made to initiate ART among HIV positive paediatric patients as soon as possible. Patients not yet receiving ART may require additional support in order to reduce attrition and LTFU.

No conflict of interest

Abstract: P_48

Comprehensive Pediatric HIV care

Active case finding: A comparison of home-based testing and health center based testing for identifying

HIV-infected children in Lilongwe, Malawi

S. Ahmed[1], M.H. Kim[1], A.C. Dave[2], K. Kanjelo[2], N. Kim El-Mallawany[1], P.N. Kazembe[2]

[1]Baylor College of Medicine, Baylor College of Medicine International Pediatric AIDS Initiative at Texas Children's Hospital, Houston, USA; [2]Baylor College of Medicine, Baylor College of Medicine-Abbott Fund Children's Clinical Center of Excellence, Lilongwe, Malawi

Background: Studies estimate that less than 10% of children overall and 20% of children of adult ART patients have been HIV-tested. Home-based HIV testing may improve early identification and enrollment into care of HIV-infected children. The objective of this study is to compare the effectiveness of home versus health center based HIV testing in identifying HIV-infected children.

Methods: The Tingathe community outreach program conducts both health center and home based HIV testing. Health center testing included both patient and provider initiated testing. Home testing included both routine door-to-door testing as well as solicited visits of family members of current ART patients. Children were generally offered testing only if the mother was infected, or they were otherwise determined to be at risk. We evaluated testing data from March 2008 to March 2011. Chi square testing was performed to compare proportions.

Results: Of 37,984 HIV tests performed, 14,358 (37.8%) were conducted in patient homes and 23,625 (62.2%) were performed in health centers. A total of 4,501 (11.9%) new positive persons were identified, 948 (21.1%) of whom were identified through home-based testing.
Of the 948 HIV-infected persons found through home-based testing, 157 (2.9%) were children age 18m-15years, 574 (9.0%) females age >15 years, and 217 (8.2%) of males age >15 years. Of the 3,553 HIV-infected persons found through health center testing, 170 (12.9%) were children age 18m-15years, 2,423 (14.6%) females age >15 years, and 960 (16.8%) of males age >15 years.
Health center based testing of children demonstrated a significantly higher prevalence than home-based testing of children (12.9% vs. 2.9%, p<.001). However, four times more children were able to be tested through the home-based strategy, resulting in roughly equivalent numbers of total children being identified (170 vs. 157, p=0.467).

Conclusions: Our study demonstrates that although a higher prevalence was seen in health center based testing, the overall yield of the home versus health center testing strategies were comparable. Both strategies will likely be important for a comprehensive approach to identification and enrollment of HIV-infected children. The children identified through the home based strategy may have been found earlier in their disease course, but further studies are necessary to compare clinical characteristics and outcomes of children identified through these differing strategies.

No conflict of interest

Abstract: P_49

Comprehensive Pediatric HIV care

Vitamin D deficiency in HIV infected children and adolescents

S. Wells[1], A. Mirza[1], C. Smotherman[2], D. Kraemer[2], M. Rathore[1]

[1]University of Florida College of Medicine Jacksoville, Pediatric Infectious Diseases and Immunology, Jacksonville FL, USA; [2]University of Florida College of Medicine Jacksoville, Center for Health Equity and Quality Research, Jacksonville FL, USA

Background: The reappearance of rickets in healthy children in the US has resulted in an increased interest in vitamin D deficiency. Studies have found high levels of vitamin D deficiency among HIV infected adolescents & young adults; however, published data among children are limited.

Objective: To determine the prevalence of & identify risk factors for vitamin D deficiency among children & adolescents infected with HIV.

Materials & methods: HIV infected children, 1-21 years old were enrolled. Serum vitamin D, parathyroid hormone (PTH) and alkaline phosphatase (ALP) levels were measured. To assess HIV activity a viral load <50 copies/mL was considered undetectable. A standardized nutritional questionnaire to assess daily vitamin D intake was administered. Vitamin D levels <15 ng/mL were considered deficient, 15-29 ng/mL insufficient & >30 ng/mL sufficient. Results were compared to healthy controls in the National Health & Nutritional Examination Survey (NHANES) 2001-2004.

Results: 57 patients were enrolled and 52 (91.2%) patients completed the study i.e. had vitamin D and PTH levels drawn. The analysis was done on the 52 patients who completed the study. The mean age was 14.5 yrs (range: 2-21 yrs, median 16). 26 (50 %) patients were male. Forty-two (81%) were perinatally infected & 46 (88.5%) were on HAART at the time of enrollment. Forty-six (88.5%) are African-American. The serum vitamin D levels ranged from 10.3 – 67.2 mg/mL; mean 22.6 ng/mL. Of the 52 patients, 10 (19.2 %) were vitamin D deficient, 30 (57.7%) insufficient & 12 (23%) sufficient. All except one patient had normal PTH. There was no significant difference in gender (p=0.45), duration of HIV infection (p=0.59), CD4 classification (p=0.29) or presence of detectable viral load (p=0.40) among vitamin D deficient, insufficient or sufficient patients. Age and BMI were found to be significantly different between the vitamin D insufficient and sufficient groups (p= 0.01 and p<0.01 respectively).
A multiple logistic regression analysis with vitamin D status as the dependent variable was performed. When controlling for viral load and gender, for each year increase in age, the odds of vitamin D deficiency compared to insufficiency or sufficiency increased by 13% (OR=1.13, 95% CI 1.02, 1.30), and for each 5 years increase in age, the odds of vitamin D deficiency compared to insufficiency or sufficiency increased by 82% (OR=1.82, 95% CI 1.08, 3.05).
Reported daily vitamin D intake was 20-1000 IU/day, (mean 177.92; median 122 IU/day). There was no difference in the average daily vitamin D intake between males & females (p=0.50).

Conclusions: The prevalence of vitamin D deficiency in our patients is 19.2%, more than twice as high as the 9% reported in NHANES (p=0.02). Among our patients with HIV infection, age was significantly associated with vitamin D deficiency. Our patients reported an average vitamin D intake lower than the recommended 600 IU/day.

No conflict of interest

AbstractP_50

Comprehensive Pediatric HIV care

HIV and Childhood Disability: A Case-Controlled Study at a Paediatric ART Centre in Lilongwe, Malawi.

A. Devendra[1], A. Makawa[1], P.N. Kazembe[1], N. Calles[2], H. Kuper[3]

[1]Baylor College of Medicine Children's Clinical Centre of Excellence, HIV, Lilongwe, Malawi; [2]Baylor College of Medicine & Texas Children's Hospital International Paediatric AIDS Initiative, Retrovirology, Houston, USA; [3]London School of Hygiene & Tropical Medicine, International Centre for Evidence in Disability, London, United Kingdom

Background: As paediatric ART is scaled-up in Southern Africa, HIV is becoming a chronic illness and many children living with HIV begin to encounter disabilities. The relationship between HIV, disability and the need for rehabilitation has been neglected. We know of no published information on disability in African children living with HIV. The objectives of the study were to:

- Measure and compare the prevalence of disability in HIV-infected and uninfected children aged 2-9 years in Lilongwe, Malawi.
- Examine types of disability, associated clinical parameters and socio-demographic factors.
- Identify the needs, opportunities, barriers and challenges in the lives of disabled HIV-infected children and their families.

Materials & methods: This was a case-controlled study (March-June 2012) of 296 randomly-selected HIV-infected children aged 2-9 years attending the BCOE ART clinic in Lilongwe (cases) and their HIV-uninfected

siblings (controls). Disability was measured using the WHO Ten Question Screen for Disability. Socio-demographic and clinical data were collected with a questionnaire administered to the caregiver and from medical records. Age and sex-adjusted odds ratios were generated with logistic regression to assess the relationship between case status, the presence of disability and clinical and socio-demographic factors.

Results: Of 296 case and control pairs recruited (mean ages 5.6 and 6.1 years respectively), females comprised 48% and 52% and 33% (99) versus 7% (20) screened positive for a disability (OR 8.4, 4.4-15.8) respectively. Of these 99 HIV-infected cases, 6%, 36%, 34%, 52%, 49% and 2% had a vision, hearing, physical, learning/comprehension, speech or seizure-related disability respectively. 61% had more than one disability. HIV-infected cases with a disability were more likely to be WHO stage III or IV at enrolment (71% vs. 52%, OR 2.7, 1.5-4.2), to have had TB (59% vs. 39%, OR 2.4, 1.4-3.9) and to have below-average school grades (18% vs. 2%, OR 11.1, 2.2-54.6) than those without. 67% of cases with a disability had never received any rehabilitative assessment or service. 29% of caregivers for these children report facing stigma and discrimination.

Conclusions: A high burden of disability was demonstrated in HIV-infected children alongside a large unmet need for rehabilitative services. This expanding issue demands fuller evaluation in order to provide an evidence base for holistic care and rehabilitative services with a view to improved quality of life for the growing number of children living with HIV.

No conflict of interest

Abstract: P_51

Comprehensive Pediatric HIV care

The impact of PCR module and electronic solution to deliver PCR results to health facilities in timely manner

A. Anita[1], M.D. Mugwaneza Placidie[1], M.D. Ndagije Felix[2]

[1]Center for treatment and research on AidsMalariaTuberculosis and other Epidemi, HIV&AIDS STIS AND Other blood borne infections divisionsion, Kigali, Rwanda; [2]CDC Rwanda, HIV Clinical Services, Kigali, Rwanda

Background: As far early infant diagnosis is concerned, PCR test is performed to identify early HIV infected infants for early initiation treatment. However, the Ministry of health and Rwanda Biomedical Center have identified that, there are avoidable dong delays in the availability of PCR test results at health facility level.Health facilities could wait for PCR results from 1 to 3 months. In response, a technical group analyzed the process related to this problem and voxiva was requested to provide a solution using tracnet technology. The objectives were to make PCR results available at health facility as soon as they are ready at national Laboratory and to generate a database for PCR module.

Materials & methods: After doing the situation analysis, Voxiva concluded that TRACnet could be used to deliver PCR tests results as soon as they are available at NRL. The solution consists in the creation of a new module for PCR for lab tests within the existing version of TRACnet.

Results: This solution has been designed and is in use as of march 2010. The proposed module was jointly designed by RBC team, National laboratory, and voxiva with a support from CDC Rwanda. As soon as results are ready at national laboratory and entered into PCR module in tracnet, short text messages (SMS) and emails of PCR results are sent back to health facilities which sent samples. Two people at health center: the nurse in charge of HIV exposed infant follow up and the lab technician receive messages.
The module also allows lab technician at national laboratory to send messages to health centers when a technical or logistic problem to process samples at the normal rate occurs and broadcast messages when the problem is solved.
All informations entered into the module are stored in a database and this one produces automatic reports and charts to show the basic statistics and indicators. An average of 7 days has been recorded from sample reception at

national laboratory to result availability at health facility.

Conclusion: TRACnet system is a simple and effective way to provide quick PCR test results to health facility. The availability of PCR tests at the health center allows health care providers to confirm the HIV status of the infant therefore initiate treatment as soon as possible. The system requires the availability of cell phones and network in the all regions of the country.

No conflict of interest

Abstract: P_52

Comprehensive Pediatric HIV care

Comparison of adherence monitoring tools and correlation to virologic failure in a pediatric HIV clinical trial

J. Intasan[1], T. Bunupuradah[2], S. Vonthanak[3], P. Kosalaraksa[4], Y. Jariyapongpaiboon[5], S. Kanjanavanit[6], C. Ngampiyaskul[7], J. Wongsawat[8], W. Luesomboon[9], T. Apornpong[10], J. Ananworanich[11], T. Puthanakit[12]

[1]HIV Netherlands Australia Thailand Research Collab, Clinical Research Associate, Bangkok, Thailand; [2]HIV Netherlands Australia Thailand Research Collab, Pediatrics, Bangkok, Thailand; [3]National Center for HIV/AIDS Dermatology and STDs, (NCHADS), Phnom Penh, Cambodia; [4]Srinagarind Hospital Faculty of Medicine Khon Kaen University, Pediatrics, Khon Kaen, Thailand; [5]Chiangrai Prachanukroh Hospital, Pediatrics, Chiangrai, Thailand; [6]Nakornping Hospital, Pediatrics, Chiang Mai, Thailand; [7]Prapokklao Hospital, Pediatrics, Chantaburi, Thailand; [8]Bamrasnaradura Infectious Disease Institute, Pediatrics, Nonthaburi, Thailand; [9]Queen Savang Vadhana Memorial Hospital, Pediatrics, Chonburi, Thailand; [10]HIV Netherlands Australia Thailand Research Collab, Biostatistics, Bangkok, Thailand; [11]HIV-NAT SEARCH the Thai Red Cross AIDS Research Center and Faculty of Medicine Chulalongkorn University, MD, Bangkok, Thailand; [12]HIV-NAT the Thai Red Cross AIDS Research Center and Faculty of Medicine Chulalongkorn University, Pediatrics, Bangkok, Thailand

Introduction: Adherence is a key factor for the success of antiretroviral therapy (ART). The optimal strategy to measure ART adherence in pediatric HIV care remains unclear. We compared 3 adherence monitoring tools and the virologic outcome in the PREDICT study.

Materials & methods: The PREDICT study enrolled ART-naïve Thai and Cambodian HIV infected children aged 1-12 years with CD4% 15-24% and randomized them to the immediate ART arm or deferred ART to CD4% <15. This substudy included data of children who had taken ART ≥ 6 months. Virologic failure (VF) was defined as HIV-RNA>1,000 copies/ml.
The adherence monitoring tools were performed every 12 weeks including; **1)** Announced pill count performed by nurses (10 minutes/visit). Poor adherence was defined as a mean pill count< 95%, **2)** Adherence Questionnaire completed by caregivers (15 minutes/visit). **3**) 3-day self report of any missed doses completed by children or caregiver (1 minute/visit). For tool 2 and 3, poor adherence was defined as any missed dose in the past 3 days before the visit. Odds ratio of poor adherence causing VF was calculated by logistic regression. Kappa statistics were used to describe the agreement between each tool.

Results: The study included data from 207 children, 54% female, 58% Thai and %CDC classification N:A:B was 1:62:37%. Median (IQR) age at ART initiation was 7 (4-9) years with median CD4% 17 (14-21)% and HIV-RNA 5.0 (4.5-5.0) $\log_{10}$copies/ml, 92% received zidovudine/lamivudine/nevirapine.
During 144 weeks, 29(14%) children had VF. Odd ratios of having VF among children who had poor adherence by pill count was 3.42, (95% CI 1.18-9.92), by adherence questionnaire was 2.11, (95% CI; 0.84-5.28, p=0.11), and 3 day self-report was 2.54, (95% CI; 1.04- 6.18)**.** Kappa agreement between Tool-1 to Tool-2 was 0.14 (slight agreement), Tool-1 to Tool-3 was 0.10 (slight agreement).

Conclusions: Poor adherence assessed by the announced pill count and the 3-day self report methods was associated with VF. Compared to pill count, the 3-day self report method has greater advantage in the rapid assessment that do not require clinic personnel for administration. This could be a useful tool to assess adherence in busy clinics.

No conflict of interest

Abstract: P_53

Complications of HIV therapy

Prevalence of insulin resistance and metabolic syndrome among HIV-infected children receiving lopinavir/ ritonavir-based antiretroviral therapy

N. Esmailzadeh[1], J. Wongsabut[2], T. Sahakitrungruang[3], P. Kosalaraksa[4], P. Suntarattiwong[5], T. Bunupuradah[6], T. Suwanlerk[7], T. Puthanakit[8]

[1]University of Copenhagen, Faculty of Medicine, Copenhagen, Denmark; [2]HIV Netherlands Australia Thailand Research Collab, Biostatistics, Bangkok, Thailand; [3]Faculty of Medicine Chulalongkorn University, Pediatrics, Bangkok, Thailand; [4]Faculty of Medicine Khon Kaen University, Pediatrics, Khon Kaen, Thailand; [5]Queen Sirikit National Institute of Child Health, Pediatrics, Bangkok, Thailand; [6]HIV Netherlands Australia Thailand Research Collab, Pediatrics, Bangkok, Thailand; [7]HIV Netherlands Australia Thailand Research Collab, Clinical Research Associate, Bangkok, Thailand; [8]HIV-NAT the Thai Red Cross AIDS Research Center and Faculty of Medicine Chulalongkorn University, Pediatrics, Bangkok, Thailand

Background: Insulin resistance (IR) and metabolic syndrome are long-term complications of antiretroviral therapy (ART) related to protease inhibitors (PIs). The study is aimed to describe prevalence of insulin resistance and metabolic syndrome among HIV-infected Thai children receiving lopinavir/ritonavir (LPV/r)-based ART.

Materials & methods: Fasting insulin, glucose, lipid profile were measured at least 8 hours apart from last meal. Insulin resistance was defined as homeostasis model assessment for insulin resistance (HOMA-IR) > 2.5 for children with tanner stage 1, and > 4.0 for children with tanner stage 2-5. Impaired fasting glucose (IFG) was defined as glucose > 100 mg/dl. Metabolic syndrome was defined as at least 3 out of 4 criteria; insulin resistance, IFG, TG > 150 mg/dl, HDL < 40 mg/dl. Multivariate logistic regression was done to explore association between insulin resistance and age, gender, tanner-stage, BMI LPV/r dosage, lopinavir level, lipid profiles.

Results: From May to November 2012,193 children were enrolled, with median (IQR) age of 14.6(12.9-16.0) years, body mass index 17.0(15.4-18.4) kg/m^2, duration of ART 9.5(7.1-11.4) years, duration of PI-based ART 4.9 (4.0-6.9) years and fasting time was 11(10-12) hours. There were 156 children (81%) with tanner stage $\geq$ 2. Twelve children (6.2%) had insulin resistance, and 4 children (2.1%) had impaired fasting glucose. Factors associated with insulin resistance were BMI > 18.5 kg/m2 [adjusted odds ratio (aOR) 6.0(95%CI 1.7-21.4)], HIV RNA > 50 copies/ml [aOR 8.5(95%CI 2.0-36.2)]. The median (IQR) of triglyceride and HDL were 156 (114-225) mg/dl and 48(40-58) mg/dl. There were 101 children(52%) who had TG > 150 mg/dl and 49 children(25%) who had HDL < 40 mg/dl. Five children (2.6%) met criteria of metabolic syndrome.

Conclusion: Insulin resistance and metabolic syndrome are uncommon among Thai children receiving PI-based HAART.

Conflict of interest
financial relationship(s): The Pediatric study for Appropriate dose of Ritonavir boosted Lopinavir in Thai HIV-infected children (the PEARL study, NCT01307124) was supported by a grant from the National Research University Project of Commission of Higher Education and the Ratchadapiseksomphot Endowment Fund (HR 1161A-55) co-funded by the Thai Government Pharmaceutical organization and the Thai National Health Security office (NHSO). The antiretroviral drug supported by Thai Government Pharmaceutical organization and the National Health Security Office, Thailand

Abstract: P_54

Complications of HIV therapy

Longitudinal study of bone mineral density and vitamin D levels among perinatally HIV-infected Thai adolescents on long-term antiretroviral therapy

S. Tanchaweng[1], T. Puthanakit[2], R. Saksawad[1], C. Brukesawan[1], A. Maleesatharn[1], K. Chokephaibulkit[1]

[1]Faculty of Medicine Mahidol university Siriraj Hospital, Department of Pediatrics, Bangkok, Thailand; [2]Faculty of Medicine Chulalongkorn University, Department of Pediatrics, Bangkok, Thailand

Background: High prevalence of low bone mineral density (BMD) has been observed in HIV-infected adolescents. We explored the changes in BMD and vitamin D during adolescence in acohort of perinatally HIV-infected adolescents.

Materials & methods: Lumbar spine (L2-L4) BMD measured by dual-energy X-ray absorptiometry (DXA) scans and blood tests for 25-hydroxyvitamin D (25-OHD) were performedin adolescents receiving care at Siriraj Hospital, Bangkok, Thailand, at two time points, 12-24 months apart. All adolescents received counseling on lifestyle and food choices to promote bone health. None received calcium or vitamin D supplements between the two BMD measurements.

Results: Of the 47 adolescents enrolled, 44.7% were male, and median age (range) at the first and the second measurements were 14.5 (12.0-18.3) and 16.2 (13.2-20) years, respectively. At the first measurement, the median (range) BMD z-score was -1.16 (-3.8 to 1.9). The proportion of adolescents with BMD z-scores ≤ -1.5, ≤ -2.0, and ≤ -2.5 were 17.0%, 12.8% and 10.6%, respectively; 13(27.7%) had 25-OHD levels < 20 ng/ml. At the second measurement, the median(range) BMD z-score fell to -1.41 (-4.75 to 2.3; p=0.023). The proportion of adolescents with BMD z-score ≤-1.5, ≤-2.0, and ≤-2.5 were 27.7%, 10.6% and 8.5%, respectively; 2(4.3%) had 25-OHD levels < 20 ng/ml (p<0.000).

Conclusion: Perinatally HIV-infected Thai adolescents have high rates of low BMD and vitamin D deficiency. Educational counseling seemed to help improve vitamin D levels, but BMD levelscontinued to decrease during adolescence. Detection and prevention of osteopenia should be incorporated in routine care for adolescents.

No conflict of interest

Abstract: P_55

Complications of HIV therapy

Cardiovascular abnormalities and carotid intima-media thickness among HIV-infected adolescents receiving long-term antiretroviral therapy in Thailand

V. Poomlek[1], K. Lapphra[1], P. Chanthong[1], S. Saihongthong[1], K. Chokephaibulkit[1]

[1]Siriraj Hospital Mahidol University, pediatric, Bangkok, Thailand

Background: Perinatally HIV-infected adolescents are at risk of cardiovascular diseases from their HIV infection and long term exposure to antiretroviral therapy, but few studies have been conducted in resource-limited settings.

Materials & methods: A cross-sectional study was conducted in HIV-infected adolescents who have been receiving HAART for at least 6 months and healthy adolescent controls. For each subject, echocardiogram and cIMT measurements were performed by experienced pediatric cardiologists who were blinded to subjects' HIV status using transthoracic echocardiography (a Philips iE 33 model echocardiography machine) and carotid ultrasound (General Electric; USA).

Results: A total of 100 HIV-infected adolescents and 50 healthy controls were enrolled. Among HIV-infected adolescents the median (range) age was 15.5 (12.0-20.4) years, 56% were male, 89% had CD4 count ≥350 cell/mm^3, 84% had HIV-RNA <50 copies/ml. In HIV-infected group, the echocardiogram revealed overall normal systolic function (median LVEF 66.15% vs. 66%, *p*= 0.825). Three HIV-infected adolescents, and none in healthy controls, had abnormal global cardiac function indicated by a myocardial performance index > 0.5, one of which also had low LVEF (53.5%) and another had abnormal diastolic function. There was no significant difference in the mean pulmonary artery pressure (PAP) between the groups (20 mmHg vs. 19 mmHg, *p*= 0.248). The mean

overall CCA and ICA cIMT were not different between HIV-infected adolescents and controls (0.03729 vs. 0.03730, *p*=0.99). Among HIV-infected adolescents, those who have been receiving protease inhibitor (PI)-containing regimens had an increased cIMT compared to those receiving non-PI regimens (0.03642 mm vs. 0.0382387 mm, *p*= 0.04). Current HIV-RNA, CD4, body mass index, sex, cholesterol and LDL-cholesterol were not associated with increased cIMT.

Conclusion: HIV-infected adolescents had relatively comparable myocardial function and very similar cIMT as healthy adolescents. However, increased cIMT was found in HIV-infected adolescents receiving PI-regimen. Longer-term follow-up will be needed to track the evolution of HIV-associated cardiovascular disease risk in this population.

No conflict of interest

Abstract: P_56

Complications of HIV therapy

Incidence of asthma in HIV-infected children after starting antiretroviral therapy

T. Bunupuradah[1], R. Hansudewechakul[2], P. Kosalaraksa[3], C. Ngampiyaskul[4], S. Kanjanavanit[5], J. Wongsawat[6], W. Luesomboon[7], S. Keadpudsa[8], T. Puthanakit[9], S. Vonthanak[10], K. Ruxrungtham[11], W.T. Shearer[12], J. Ananworanich[13]

[1]HIV Netherlands Australia Thailand Research Collab, Pediatrics, Bangkok, Thailand; [2]Chiangrai Prachanukroh Hospital, Pediatrics, Chiangrai, Thailand; [3]Srinagarind Hospital Faculty of Medicine Khon Kaen University, Pediatrics, Khon Kaen, Thailand; [4]Prapokklao Hospital, Pediatrics, Chantaburi, Thailand; [5]Nakornping Hospital, Pediatrics, Chiang Mai, Thailand; [6]Bamrasnaradura Infectious Disease Institute, Pediatrics, Nonthaburi, Thailand; [7]Queen SavangVadhana Memorial Hospital, Pediatrics, Chonburi, Thailand; [8]HIV Netherlands Australia Thailand (HIV-NAT) Research Collaboration Thai Red Cross AIDS Research Center, Pediatrics, Bangkok, Thailand; [9]HIV Netherlands Australia Thailand (HIV-NAT) Research Collaboration Thai Red Cross AIDS Research Center and Department of Pediatrics Faculty of Medicine Chulalongkorn University, Pediatrics, Bangkok, Thailand; [10]Social Health Clinic, Pediatrics, Phnom Penh, Cambodia; [11]HIV Netherlands Australia Thailand (HIV-NAT) Research Collaboration Thai Red Cross AIDS Research Center and Faculty of Medicine Chulalongkorn University, Department of Medicine, Bangkok, Thailand; [12]Texas Children's Hospital and Baylor College of Medicine, Pediatrics, Houston, USA; [13]HIV Netherlands Australia Thailand (HIV-NAT) Research Collaboration Thai Red Cross AIDS Research Center Department of Medicine Faculty of Medicine Chulalongkorn University and SEARCH Thai Red Cross AIDS Research Center, Pediatrics, Bangkok, Thailand

Background: Incidence of asthma was significantly increased after antiretroviral therapy (ART) commencement in HIV-infected US children due to immune reconstitution. Here we evaluate incidence of asthma in HIV-infected Asian children.

Materials & methods: ART-naïve Thai and Cambodian children 1-12 years old, CD4 15-24%, without severe HIV symptoms were enrolled and randomized to immediate-arm which started highly active antiretroviral therapy (HAART) at baseline or deferred-arm which started HAART when CD4% dropped to <15%. In this analysis children were categorized into two groups: 1) those who initiated HAART during the 144 weeks (HAART-group) and 2) those who did not initiate HAART over 144 weeks (no-HAART group). All children were followed every 12 weeks for physical examination, adverse events and medications records until week 144 week.
Asthma diagnostic criteria were Criterion-1) physician's diagnosis of asthma after age ≥3 years old e.g. asthma, asthmatic bronchitis, bronchial hyperreactivity, Criterion-2) asthma medication use after age ≥3 years e.g. bronchodilators, inhaled corticosteroids.

Results: 299 children, 218 in HAART-group and 81 in no-HAART group, were enrolled. Baseline median (IQR) age was 6.8 (4.1-8.7) years, %female was 58%, %Thai:Cambodian was 60:40%, %CDC clinical classification N:A:B was 2:62:36%. Baseline median (IQR) CD4% in HAART-group vs. no-HAART was 17(14-21)% vs. 21(18-25)% (p<0.001) and baseline HIV-RNA was 5.0(4.4-5.0) vs. 4.6(4.0-4.9) $\log_{10}$copies/ml (p<0.001).
The overall incidence of new onset asthma was 13.3% in HAART vs. 16.1% in no-HAART group (p=0.54) with incidence by Criterion-1 of 1.4 vs. 6.2% (p=0.04), and by Criterion-2 of

13.3 vs. 16.1% (p=0.54). At asthma diagnosis, median (IQR) CD4% in HAART-group vs. no-HAART was 21(18-31)% vs. 22(18-25)% (p=0.6).

Conclusion: Around 15% of HIV-infected children had asthma which is comparable to that reported in healthy Thai children (18%). Despite superior CD4 reconstitution, children on HAART did not have higher incidence of asthma compared to those without HAART.

No conflict of interest

Abstract: P_57

Complications of HIV therapy

A Retrospective Evaluation of Switching from Stavudine to Zidovudine-based HAART in HIV-infected Children from Lesotho

M. Srivastava[1], L.K. Thahane[1], D. Cape[1], E.Q. Mohapi[1], G. Schutze[2]

[1]Baylor College of Medicine, Baylor International Pediatric AIDS Initiative, Maseru, Lesotho; [2]Baylor College of Medicine, Baylor International Pediatric AIDS Initiative at Texas Children's Hospital, Houston, USA

Background: The World Health Organization (WHO) recommended in its 2006 guidelines that antiretroviral therapy (ART) naïve children in resource-limited settings be initiated on stavudine (d4T) due to tolerability early in treatment and the need for minimal laboratory monitoring as compared to zidovudine (AZT). The revised WHO guidelines in 2010, however, indicate that AZT is preferred over Abacavir (ABC), and ABC preferred over d4T. There are few studies on switches from d4T to AZT-based highly active antiretroviral therapy (HAART) in children from resource-limited settings, particularly in Africa. This study evaluates substitution of AZT for d4T amongst pediatric patients at the Baylor College of Medicine / Bristol Myers-Squibb Children's Clinical Centre of Excellence (COE) in Maseru, Lesotho.

Materials & Methods: The study is a retrospective analysis of electronic medical record data of COE patients ≤ 18 years of age at time of d4T to AZT substitution. Patients switched from d4T to AZT-based HAART regimens between March 1st, 2010 and July 1st, 2011 as part of a national phase-out strategy were included in the study. The study period ended on January 1st, 2012. Baseline clinical parameters obtained while on d4T were compared to the same parameters post-AZT initiation. In particular, rates of anemia and the change in hemoglobin value following AZT initiation were determined.

Results: 105 patients met inclusion criteria for the study. 54/105 (51%) were male. The median duration on d4T prior to switch to AZT was 28.7 months (IQR 14.4-38.3, Range 4.0-66.6). There was a statistically significant improvement in hemoglobin level (8.4 *vs.* 12.2 g/dL; $P < 0.001$), CD4 count (626 *vs.* 1342 cells/μL); $P < 0.001$) and CD4 percent (14 *vs.* 30 percent; $P < 0.001$) from baseline to time of AZT substitution, with the majority of children demonstrating immune recovery. The median duration on AZT post-switch was 16.5 months (IQR 3.2-18.0, Range 1.6-20.8). 3/105 (2.85%) patients developed anemia. One patient (0.95%) required cessation of AZT due to grade IV anemia on day 495 of use and had recently finished a course of Isoniazid Preventive Therapy. 2 patients (1.9%) developed grade 1 anemia, but did not require discontinuation of AZT. 102 patients remained on AZT-based HAART and 86 patients were followed until the end of the study period without evidence of anemia, with 13 patients transferred out and 3 lost to follow-up. Overall, there was a statistically significant decrease in hemoglobin level (12.3 *vs*. 12.0 g/dL; $P < 0.005$) after switch to AZT; however, this was not clinically significant.

Conclusions: In our population, a very low rate of anemia was observed when switching from d4T to AZT-based HAART regimens. In settings with high rates of anemia, starting d4T and switching to AZT once baseline anemia has resolved may be a useful strategy to minimize both the side effects of d4T-related lipodystrophy and AZT-induced anemia. A possible interaction between Isoniazid and AZT resulting in anemia warrants further research. Further studies in resource-limited settings evaluating the long-term efficacy and

toxicities of HAART switch strategies are needed in the pediatric population.

No conflict of interest

Abstract: P_58

Complications of HIV therapy

Stable bone mineral density in a cohort of vertically-infected HIV-adolescents with ART

A. Alvarez[1], B. Amorín[1], M.I. Gonzalez Tome[1], L. Prieto[2], J.T. Ramos[2], P. Rojo[1]

[1]Hospital 12 de Octubre, Department of Pediatrics, Madrid, Spain; [2]Hospital Getafe, Department of Pediatrics, Getafe, Spain

Background: Many studies in HIV infected-children and adults have described low bone mineral density (BMD) and calcium metabolism abnormalities. These have been attributed to the ARV treatment and to the viral-associated inflammation. There are not many longitudinal studies of BMD in HIV-infected children and adolescents, and especially of a long duration.

Objectives: To analyze the evolution of BMD in a cohort of HIV-infected by vertical transmission children and adolescents treated with HAART.

Materials & methods: Retrospective study describing BMD at two different periods of life (P1 and P2) in a cohort of HIV infected children by vertical transmission in Madrid (Spain). BMD, anthropometry and laboratory data (CD4 and viral load) were collected. We adjusted by height and race for Z score BMD (BMD-a).

Results: Fourty-two HIV infected children were studied. Baseline data included median age 9,6 years (IQR 7-11.5), 66% female, 90% Caucasians, Tanner 1: 66%, clinical CDC C: 27%, immunological CDC 3: 40% and viral load <50cop/ml: 42%. Median between both periods were 6.3 years (IQR 5.4-7.8). Tanner stage 5 was completed at 58% at P2. BMD Z score <-2 at P1 was 11% and at P2 8.9% and BMD-a <-2 at P1 was 6.7%and at P2 6.3%. There were no statistical differences between both periods at BMD and BMD-a Z score.

Conclusions: In our cohort of children, low BMD (Z score<-2) was not common, after adjusting for height and race. In our population of children treated with HAART for a prolonged period there was no decrease of BMD-a overtime and only weight and BMI is associated with low BMD at adolescent period.

No conflict of interest

a medical education company

Reviews in Antiviral Therapy & Infectious Diseases

7//2013