

PDA0106

Innate lymphoid cells are reduced in pregnant HIV positive women and are associated with preterm birth

C. Akoto¹; C. Chan¹; C. Tshivula-Matala¹; K. Ravi¹; W. Zhang¹; M. Vathish¹; S. Norris² and J. Hemelaar¹

¹University of Oxford, Nuffield Department of Women's & Reproductive Health, Oxford, United Kingdom, ²University of the Witwatersrand, South African Medical Research Council Developmental Pathways for Health Research Unit, Department of Paediatrics, School of Clinical Medicine, Johannesburg, South Africa

Background: Preterm birth is the leading cause of neonatal and child mortality worldwide. Globally, 1.4 million pregnant women are estimated to be living with HIV/AIDS, the majority of whom live in sub-Saharan Africa. Maternal HIV infection and antiretroviral treatment (ART) have been associated with increased rates of preterm birth, but the underlying mechanisms remain unknown. Acute HIV infection is associated with a rapid depletion of all three subsets of innate lymphoid cells (ILCs), ILC1s, ILC2s and ILC3s, which is not reversed by ART. ILCs have been found at the maternal-foetal interface and we therefore investigated the potential association between maternal HIV infection, peripheral ILC frequencies and preterm birth.

Methods: We conducted flow-cytometric analysis of peripheral blood samples from 46 HIV-positive (HIV+) and 45 HIV-negative (HIV-) pregnant women enrolled in a prospective pregnancy cohort study in Soweto, South Africa. Frequencies of ILC1s, ILC2s and ILC3s were compared between women with and without HIV infection, and between women with and without PTB or spontaneous preterm labour (Sp-PTL).

Results: We show that maternal HIV infection is associated with reduced levels of all three ILC subsets. Preterm birth was also associated with lower levels of all three ILC subsets in early pregnancy. ILC frequencies were lowest in HIV positive women who experienced preterm birth. Moreover, ILC levels were reduced in pregnancies resulting in spontaneous onset of preterm labour and in extreme preterm birth (<28 weeks gestation).

Conclusions: Our findings suggest that reduced ILC frequencies may be a link between maternal HIV infection and preterm birth. In addition, ILC frequencies in early pregnancy may serve as predictive biomarkers for women who are at risk of delivering preterm.

PDA0107

Youth perinatal HIV-associated cognitive impairment: Associations with childhood trauma

N. Phillips¹; D. Stein¹; L. Myer²; H. Zar³ and J. Hoare¹

¹University of Cape Town, Psychiatry and Mental Health, Cape Town, South Africa, ²University of Cape Town, Public Health and Family Medicine, Cape Town, South Africa, ³University of Cape Town, Child Health, Cape Town, South Africa

Background: Exposure to childhood trauma is associated with cognitive impairment in non-clinical populations. The association between childhood trauma and cognitive impairment in the context of perinatal HIV-infection has not been published to-date. This study was nested within the Cape Town Adolescent Antiretroviral Cohort (CTAAC) neuro sub-study, a longitudinal cohort of perinatally ARV-treated HIV-infected youth from public healthcare facilities across Cape Town, South Africa. The purpose was to examine the association between childhood trauma and HIV-associated cognitive impairment among perinatally HIV-infected youth.

Methods: HIV-infected youth and HIV-uninfected controls completed a comprehensive neuropsychological battery and the Childhood Trauma Questionnaire (CTQ). We then assessed associations between cognitive impairment in various domains and CTQ scores by means of a simple bivariate correlation.

Results: Results represent data from 36-month CTAAC follow-ups, which includes 122 HIV-infected and 35 HIV-uninfected controls between 12 and 15 years old. Independent samples t-test show no statistically significant differences in self-reported childhood trauma between HIV-infected youth and controls (i.e.: both groups showed low – moderate levels of trauma). Within the HIV-infected group CTQ total scores were significantly correlated with impaired working memory ($r = .228$, $p = .023$) and processing speed ($r = .238$, $p = .016$). The CTQ subscale of emotional abuse was significantly correlated with the domains of attention, working memory and processing speed, yet the CTQ subscale of emotional neglect was only correlated with impaired processing speed ($r = .204$, $p = .041$). The CTQ subscales of physical abuse and neglect and sexual abuse were not significantly correlated with any of the cognitive domains. In the control group childhood trauma on the physical neglect subscale correlated with impaired general intellectual function and emotional abuse correlated with impaired motor coordination.

Conclusions: The majority of HIV-infected youth in South Africa live in very low socioeconomic environments and are exposed to numerous risk factors, the most significant of which is childhood trauma. Given the association between childhood trauma and cognitive impairment, limiting childhood trauma should be a major public health concern. These findings suggest that low – moderate trauma within the HIV-infected group is associated with more cognitive problems compared to controls. This study provides preliminary data to further investigate the relationship between childhood trauma and HIV-associated cognitive impairment.

PDA0202

High Y-chromosome DNA concentrations are associated with increased cervical cytokine concentrations and activated cervical HIV target cell frequencies

J. Jewanraj^{1,2}; S. Ngcapu^{1,2}; V. Ramsuran^{1,2,3}; A. Mtshali^{1,2}; L. Mansoor¹; S. Abdool Karim^{1,4}; Q. Abdool Karim^{1,4}; J.-A. Passmore^{1,5,6} and L. Liebenberg^{1,2}

¹Centre for the AIDS Programme of Research in South Africa (CAPRISA), Durban, South Africa, ²School of Laboratory Medicine and Medical Science, College of Health Sciences, University of KwaZulu-Natal, Durban, South Africa, ³KwaZulu-Natal Research and Innovation Sequencing Platform (KRISP), Durban, South Africa, ⁴Department of Epidemiology, Columbia University, New York City, United States, ⁵Institute of Infectious Disease and Molecular Medicine IDM, University of Cape Town, Cape Town, South Africa, ⁶National Health Laboratory Service, Cape Town, South Africa

Background: Semen is the carrier for spermatozoa and the primary vector for heterosexual transmission of HIV to women during intercourse. Semen induces cytokine production and immune cell recruitment at the female genital tract (FGT) in order to facilitate conception. Since genital inflammation increases HIV susceptibility in women, semen-induced alterations at the FGT may also have implications for HIV risk. Here we investigated the contribution of semen exposure to biomarkers of inflammation associated with HIV acquisition.

Methods: Genital specimens were collected every 6 months (average 5 ± 1 visits) from 149 HIV-negative women participating in the CAPRISA 008 tenofovir gel open-label extension trial ($n = 693$ specimens). Y-chromosome DNA (YcDNA) was extracted using a Human Y-chromosome DNA detection kit and quantified using the Quantifiler Trio DNA quantification kit in cervicovaginal lavage (CVL) pellet specimens. In matched CVL supernatant specimens, YcDNA concentrations were compared with concentrations of 48 cytokines and 9 matrix metalloproteinases (MMPs; epithelial barrier function proteins) determined by multiplexed enzyme-linked immunosorbent assay (ELISA),