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Barriers and Promoters to Uptake of Safer Conception Strategies among HIV-serodiscordant Couples with Fertility Intention in Mbarara, Uganda

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Background: The role of neutralizing antibody (NAb) in mother-to-child transmission (MTCT) of HIV-1 remains unclear. Previous studies suggest that maternal NAb might reduce HIV-1 transmission. Higher NAb titers to MBA, a CRF01_AE strain with an unusually long V2 domain, were found to correlate with lower rates of intrapartum MTCT. However, findings from different MTCT studies are inconsistent, and further work is required to clarify the impact of NAb in MTCT.

Methods: In this study, we evaluated NAb breadth and potency in plasma from 101 HIV+, ART-naïve mothers (22 transmitters and 79 non-transmitters) collected at delivery, and from 51 of their infants (16 HIV+ and 35 HIV-) collected two months after birth. Pseudovirus (PV) assays were employed using a panel of six CRF01_AE isolates, including MBA and RV144 vaccine strains TH023 and CM244. NAb activity is reported as ID50 titer or positive area under the curve (+AUC), useful for evaluating samples with low NAb activity.

Results: Contrary to previously published results, maternal geometric mean NAb titers and +AUC trended higher for transmitters compared to non-transmitters for five of the six PV tested (including MBA), with a significant difference observed for CM244 ($p=0.047$). Maternal NAb breadth was also increased in transmitters ($p=0.047$) and directly correlated with viral load ($p=0.037$). As expected, infant NAb +AUC was increased for HIV+ infants compared to those that did not seroconvert for two pseudoviruses CM244 ($p=0.042$) and 644039 ($p=0.019$). The relationship between mother and infant NAb activity is currently being evaluated.

Conclusions: Greater magnitude maternal NAb titers were unexpectedly associated with MTCT transmission of HIV, but correlated with higher viral load. Further work is required to understand the development, specificity, and function of NAb in MTCT of HIV.

OA23.02

PMTCT Adherence in Pregnant South African Women: The Role of Depression, Social Support, Stigma and Structural Barriers to Care

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Background: Depression is a robust predictor of non-adherence to antiretroviral therapy, essential in PMTCT. Women in resource-limited settings are likely to face additional barriers to PMTCT adherence, including stigma and structural barriers. While structural barriers may be circumvented by social support; depression and stigma may make access difficult. Understanding modifiable factors that contribute to PMTCT adherence can inform interventions.

Methods: 167 HIV-infected women enrolled in PMTCT (median age 28 years) completed an interview at ≥ 28 weeks of

pregnancy assessing depression, stigma, social support and structural barriers to PMTCT. An adherence score was created using principal components analysis on the response to four questions assessing adherence over the past 30 days. Depression was defined as a Hopkins score > 1.75 and was examined as a predictor of the adherence score in a linear regression model. Separate linear regression models also examined relationships between

- (1) social support and structural barriers (income and time spent traveling to clinic) and
- (2) depression and stigma as predictors of social support.

Results: Participants with elevated depressive symptoms had significantly lower adherence scores ($p < 0.01$). Neither income ($p = 0.10$) nor time spent traveling to clinic ($p = 0.28$) predicted adherence; thus, moderation with social support was not examined. Depression significantly predicted social support ($est = -0.46$, $p < 0.01$): those with elevated depressive symptoms had a lower social support score. Similarly, a higher stigma score was significantly associated with a lower social support score ($est = -0.09$, $p < 0.01$).

Conclusions: While PMTCT programs are effective, adherence to these services is suboptimal. Depression may play an important role in adherence to these behaviors. HIV infected pregnant women with elevated depressive symptoms may also suffer from low social support and high stigma; interventions targeting these factors may support maternal and fetal health.

OA23.03

Barriers and Promoters to Uptake of Safer Conception Strategies among HIV-serodiscordant Couples with Fertility Intention in Mbarara, Uganda

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Background: We investigated barriers and promoters to uptake of a safer conception approach to pregnancy among HIV serodiscordant couples in Mbarara, southwestern Uganda.

Methods: We recruited HIV-infected men and women (index) receiving antiretroviral therapy (ART) from the Uganda Antiretroviral Rural Treatment Outcomes cohort who reported an uninfected or unknown status partner (partner), serostatus disclosure to the partner, and personal or partner desire for a child within 2 years. We conducted 40 separate in-depth interviews with 20 couples to explore periconception risks and awareness of specific safer conception strategies. Data were translated, transcribed, and analyzed using content analysis.

Results: 12/20 index participants were women, with median age of 36 yrs [IQR 29-41], and median recent CD4 of 433 cells/mm³ [IQR: 277-575]. Median partner age was 34yrs [IQR 30-40]. Awareness of HIV prevention strategies beyond condoms and abstinence was limited, however, some participants described timed intercourse and 'ART as prevention' as ways to reduce HIV transmission. Participants were motivated to learn more

about safer conception strategies. Key barriers included limited couple communication about childbearing plans and understanding of HIV sero-discordance. Fatalism about eventual HIV acquisition by the uninfected partner or a sense of protection due to “strong blood” or “God’s will” were common perceptions that decreased motivation to practice HIV prevention. Many participants prioritized pregnancy with minimal perceived options for reducing HIV risk. The more vulnerable partner (HIV-infected and/or female) was often eager to pursue pregnancy to secure the relationship, regardless of HIV acquisition or transmission risks.

Conclusions: Awareness of ART for prevention and high interest in other safer conception strategies presents opportunity to encourage mutual status disclosure, contravene normative expectations of eventual seroconversion, and promote strategies to minimize periconception HIV risks.

OA23.04

“I Would Say it Does Concern Me and on the Other Hand it Doesn’t.” Perceptions of South African Learners’ Experiences with Sex, Pregnancy, and HIV

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Background: HIV/AIDS, sexually transmitted infections (STIs) and teenage pregnancy are concerns for South Africa’s youth. Adolescent pregnancy is a major cause of interrupted schooling and drop-out despite pregnant learners being protected by law. Incomplete education and early pregnancy are risk factors for HIV acquisition. This study reports on perceptions of learners’ experiences with sex, pregnancy, and HIV.

Methods: Focus groups were held with male and female learners (n=41, 4 groups), parents (n=19, 2 groups), educators (n=11, 2 groups) and community members (n=19, 2 groups) recruited through two schools in eThekweni District, KwaZulu-Natal, South Africa. Discussions were transcribed, translated and data coded. Results were organised according to key themes and NVivo used to facilitate data analysis.

Results: Almost half the learners (n=17), aged 16–21, had initiated sex, most common age of first sex was 15 (n=5). Four learners had been pregnant. Substance use, transactional sex and low/inconsistent condom use were the main risk factors for pregnancy and STIs. Although learners knew about HIV, some were not concerned about it, “*there is something you can use to reduce it*”, however stigma was a barrier to accessing HIV-related services. While teachers discussed HIV with learners, across groups, most felt that parents should provide advice on abstinence, protection during sex and monogamy. However some parents lacked information and others feared discussing HIV with their children. Teenage pregnancy was reportedly common in schools, mostly unplanned but some perceived to access government grants. Pregnancy led to drop-out and gaps in schooling.

Conclusions: Teenage learners are practicing unprotected sex despite being educated about HIV and pregnancy. Barriers to accessing services put them at risk. There is a need for improved access to services, better access to information for parents, and improved relationships with parents to address gaps and influence behaviour.

Mucosal Responses

OA24.01

Vaccine Induced Responses in a SIV Model Can Impact Challenge Outcomes

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Background: The use of cytokine gene adjuvants to tailor the immune response is a strength of EP DNA vaccination. This has been established through the recent HVTN080 trial which demonstrated the potency of IL-12 with EP delivered DNA to drive T cell responses. However, for an HIV vaccine it is important to also induce strong humoral responses. To address the possible role of serum and vaginal IgA in HIV acquisition we utilized an adjuvanted DNA vaccine previously shown to drive IgA induction in a non-human primate vaginal challenge model. **Methods:** Groups of 5 Indian rhesus macaques received a pSIVmac239 gag/pol and pSIVe660 gp120 alone, or with plasmids - pCCL25 (TECK), pCCL27 (CTACK) or pCCL28 (MEC), genetic adjuvants, at weeks 0, 6, 12, 18 and 48. Animals were challenged with 500 TCID₅₀ SIVsmE660 intravaginally twice a week for two weeks for 4 challenges.

Results: We observed higher vaginal IgA titers in gene adjuvanted animals compared with DNA vaccine alone. Following challenge, we observed an overall protection rate of 68% for all vaccinated animals. However, this protection rate was different for each vaccination regiment. Animals vaccinated with CCR10Ls, (CCL27 and CCL28,) exhibited robust control of set point viremia and chronic viremia (p<0.05) with 89% of animals controlling infection compared with only 40% in unadjuvanted animals and 14% in naïve challenge controls. However, CCR9L (CCL25) vaccinated animals resisted challenge in 60% of animals. Irrespective of vaccine group, animals that controlled viremia had the highest vaginal IgA and IgG levels post-vaccination.

Conclusions: Inclusion of immune plasmid adjuvants encoding mucosal chemokines in EP DNA vaccine regiments can improve challenge outcomes. Collectively these adjuvant approaches likely have importance for the development of next generation DNA vaccines and the data illuminates the need for continued research into the role of vaginal antibodies and protection from viral infection in NHP models.

OA24.02

Local HIV-specific IgA Antibody Production in the Penile Urethra Mucosal Compartment

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Background: Whereas the genital mucosa serves as the first immune barrier to sexually transmitted pathogens, little is