

P4-S1.09 DEVELOPMENT OF A MICROWAVE-ACCELERATED METAL-ENHANCED FLUORESCENCE 40 S, <100 CFU/ML POINT OF CARE ASSAY FOR THE DETECTION OF CHLAMYDIA TRACHOMATIS AND NEISSERIA GONORRHOEA

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Chlamydia trachomatis (CT) is the most prevalent bacterial sexually transmitted infection (STIs) reported to the Centers for Disease Control and Prevention (CDC). There were 1.2 million cases of chlamydia reported to the CDC in 2008. *Neisseria gonorrhoeae* (GC) is also one of the most prevalent sexually transmitted infections in men and women. In 2009, there were 301 174, cases reported to the CDC, a rate of 99.1 per 100 000 populations. The CDC estimates that STIs cost the healthcare system \$1.5 billion annually. Subsequently, there is an urgent need to develop a low cost sensitive and specific rapid diagnostic test to detect bacterial sexually transmitted infections. To this end, an exciting, novel and rapid technology, which integrates power lysis[®] and MAMEF (Microwave-Accelerated Metal-Enhanced Fluorescence), to both lyse CT and GC and detect the DNA released from CT and GC and combined CT and GC samples, within 40 s, is demonstrated. In a microwave cavity, 2.45 GHz microwave energy is highly focused into a lysing chamber, using 100 nm thick gold films with “bow-tie” structures, to lyse the bacteria within 10 s. The ultrafast detection of the released DNA from <100 cfu/ml bacteria is accomplished in an additional 30 s by employing the microwave-accelerated metal-enhanced fluorescence (MAMEF) technique. This new “release and detect” platform technology is a highly attractive alternative method for the lysing of bacteria, DNA extraction and the fast quantification of bacteria and potentially many other pathogenic species and cells as well. Our approach is a significant step forward for the development of a point of care test for bacteria.

P4-S1.10 LONGITUDINAL CHANGES IN CERVICOVAGINAL CYTOKINE LEVELS UPON INCIDENT CHLAMYDIA TRACHOMATIS INFECTION AMONG YOUNG WOMEN

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Background Highest rates of genital *Chlamydia trachomatis* (CT) infection are found in 15–24-year-old women. Animal, in vitro, and ex vivo studies have identified several inflammatory and regulatory cytokines that impact infection clearance, recurrence, and immunopathology. However, the in vivo natural history of the cytokine

Abstract P4-S1.10 Table 1 Longitudinal changes in cervicovaginal cytokine levels upon incident *Chlamydia trachomatis* infection among young women (N=64 women)

Cytokine	Median cytokine level at negative CT visit (pg/ml)	Median cytokine level at subsequent positive CT visit (pg/ml)	Women with positive response, n (%)	Women with no response, n (%)	Women with negative response, n (%)
IL-6	30.3	30.3	23 (36)	19 (30)	22 (34)
IL-8	1855.5	1832.6	8 (16)	30 (60)	12 (24)
IL-1 α	345.3	316.1	23 (36)	14 (22)	27 (42)
IL-1 β	29.0	43.3	31 (48)	14 (22)	19 (30)
MIP-1 α	14.1	19.6	28 (44)	16 (25)	20 (31)
RANTES	3.2	5.1	30 (47)	22 (34)	12 (19)
IFN γ	3.2	3.2	16 (25)	43 (67)	5 (8)

CT, *Chlamydia trachomatis*.

response is not well-described. Our study aim was to characterise the cytokine levels in the cervicovaginal secretions of young women with incident CT.

Methods Women were eligible to enrol (as part of a prospective HPV Natural History Study) who were 13–21 years old, sexually active (5 years maximum), and had no history of cervical neoplasia or procedures, or immunosuppression. Women were seen every 4 months for interviews, infection tests, and cervicovaginal lavage samples for cytokine measurement by Luminex[®] multiplex assay. CT was detected by nucleic-acid amplification. This prospective study selected women (N=64) who had incident CT infection, defined as a negative CT result followed by a positive CT result at a later visit. Cytokine levels were tested at each woman’s pair of negative and positive visits. Each sample was run in duplicate wells. To address assay variation among our samples, per cent-differences between duplicate wells were calculated. A woman’s cytokine response was defined as “positive” if the per cent-increase from her negative visit to her positive visit exceeded the [mean+2 SD] of the inter-well per cent-difference for that cytokine. Similarly, “negative” was defined as an inter-visit per cent-decrease that exceeded the [mean+2 SD] of the inter-well per cent-difference. The remaining women were defined as having “no response”.

Results The mean age at incident infection was 19 years. Infections concurrent to the positive CT were detected for HPV in 24 (38%) women; yeast in 10 (16%); bacterial vaginosis in 5 (8%); *Neisseria gonorrhoeae* in 3 (5%); and *Trichomonas vaginalis* in 1 (2%). Abstract P4-S1.10 table 1 shows the distribution of cytokine responses. Response status was not significantly associated with age or other genital infections (HPV, yeast, bacterial vaginosis, *N gonorrhoeae*, *T vaginalis*) detected at either the negative CT or positive CT visits.

Conclusions In young women with incident CT, the in vivo cytokine responses measured in the cervicovaginal fluid compartment are heterogeneous. Differences in the cytokine milieu between individuals may have implications for immune defense and immunopathology.

Basic sciences poster session 2: HIV and Hepatitis

P4-S2.01 A CROSS-SECTIONAL SURVEY OF HEPATITIS B VIRUS INFECTIONS AND NATURAL IMMUNITY AGAINST HEPATITIS B VIRUS INFECTIONS AMONG HIV DISCORDANT HETEROSEXUAL COUPLES IN KISUMU, KENYA

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Background HIV and hepatitis B virus (HBV) share transmission modes. HIV infected people are thought to be at increased risk of

HBV acquisition, chronic HBV infection and HBV disease. Chronic HBV infection may pose a challenge among HIV infected individuals' eligible for antiretroviral therapy, increasing their risk of rapid HIV-disease progression. Early prevention of HBV infection by vaccinating HIV infected people is recommended. However, in most poor countries HBV vaccination is not routine and those opting for vaccination are rarely tested before vaccination. We sought to determine the prevalence of HBV infection and natural immunity against HBV infection among HIV discordant couples.

Methods The first 949 discordant heterosexual couples screened for eligibility into an HIV pre-exposure prophylaxis study had HBV surface antigen (HBsAg) and anti-HBs status determined. CD4 count was also performed for HIV infected potential subjects. None of these participants reported HBV vaccination history. SPSS version 17 software was used for statistical analysis.

Results Of 949 HIV positive subjects, 34.7% (329) were men thus women were more likely to be the HIV-positive spouse in these HIV-discordant relationships ($p < 0.001$). 99 of 1898 subjects were positive for HBVsAg, resulting to 5.2% HBV prevalence, with men being more likely to be HBV infected compared to women ($p < 0.05$). 40% (758) of 1898 subjects tested for anti-HBs were immune to HBV, with men being more likely to possess natural protective antibodies against HBV compared to women ($p < 0.05$). Among HIV infected subjects, those with a CD4 count > 250 cells/ml were more likely to possess immunity against HBV compared to those with a CD4 count < 250 cells/ml ($p < 0.001$). However, HIV status was not associated with either HBV infection ($p = 0.302$) or immunity against HBV ($p = 0.512$).

Conclusion Scaling-up routine vaccination after anti-HBs screening in resource limited settings could be cost-effective and easy to roll-out in HIV endemic Sab-Sahara Africa. This is because 40% of individuals are already immune to HBV. Validation of Anti-HBs rapid screening tests is urgently needed in this population.

P4-S2.02 REGULATORY T CELLS AND FOX P3 LEVELS IN NAIVE AND HAART TREATED HIV-1 INFECTED PATIENTS IN THAILAND

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Background The frequency and expression levels of FoxP3 in regulatory T-cells (T-regs) from advanced-stage HIV-infected patients are controversial. Thus, the aims of this study were to compare these parameters of T-regs from HIV infected patients and from healthy controls.

Methods T-reg population and expression levels of FoxP3 were assessed from 45 HIV-1 infected individuals and 12 healthy controls by using FACs flow cytometry.

Results Minor decrease in frequencies of T-regs was found in both infected groups (naïve and treated) compared with those from healthy controls ($p = 0.02$, $p = 0.01$, respectively). In contrast, a significantly increase in the ratios of T-regs: CD4 cells from HIV-infected patients was observed ($p = 0.001$). In addition, FoxP3 expression levels in both treated and untreated HIV-1 infected patients were significantly higher than those in healthy controls ($p < 0.001$ and 0.01 respectively).

Conclusions The decreased number of T-regulatory cells and the increased levels of FoxP3 in T-regs from HIV infected patients were associated with advanced stage of AIDS disease.

P4-S2.03 CALCULATING BMI IN HIV+ FEMALE ADOLESCENTS: A CASE OF SHAPING THE HEALTH OF ADOLESCENTS IN ZIMBABWE: SHAZ! PLUS PROJECT

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Background Body Mass Index (BMI) is a statistical measure which compares a person's weight and height. It is used to estimate a healthy body weight based on a person's height. This measure is pertinent to use in HIV positives since weight loss is used as a proxy measure for clinical progression of HIV disease in that more weight loss is associated with advancing disease and often precedes clinical symptoms. We sought to measure BMI among HIV+ female adolescents to see if this is the best tool to use in immune-compromised populations.

Methods Data were pulled out from an ongoing RCT entitled SHAZ! Plus. (N=650). It enrolls HIV +ive female adolescents who are out of school. Data were collected at baseline, 6, 12 and 18-month follow-up visits, with the project facilitating ongoing care, ART and support to those in need of it. BMI was calculated using Adolphe Quetelet BMI calculator of weight in kg over height in m² (kg/m²). BMI prime 25 was also calculated and used to compare the BMI results. Sample of xx used.

Results 64.5% of the cohort had BMIs falling within normal ranges 18.5 to 25. 33.8% had BMIs of < 18.5 and 0.16% had a BMI of > 25 . 64.5% had BMI prime that fell within normal ranges of 0.74 and 0.99. 33.8% had BMI prime of < 0.74 and 0.16% had a BMI prime of > 1.00 . The average BMI at baseline was 19.35 Weight ranged from 25 to 70 at baseline, average was 47.71.

Conclusion Results call for the need to come up with an adjusted BMI index for female adolescents who are immune-compromised to use as a standard measure for optimal health. BMI however has its shortcomings since it does not measure the actual body fat. In resource poor settings, a simple tool like weight lost or gained over time might be a good indicator of clinical progression of HIV as opposed to validated tools like the BMI.

Basic sciences poster session 3: ureaplasma, trichomonas and syphilis

P4-S3.01 MACROLIDE-RESISTANCE TESTING AND MOLECULAR SUBTYPING OF TREPONEMA PALLIDUM STRAINS FROM SOUTH AFRICA

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Objectives To determine whether the main 23S rRNA mutation (A2058G) that confers macrolide resistance in *Treponema pallidum* is present among DNA obtained from syphilitic ulcers in South Africa and to determine the strain subtype distribution using molecular methods.

Methods DNA was re-extracted from sixty ulcer swabs, previously shown to contain *T pallidum* DNA by in-house real-time multiplex PCR assay, using a MagNA Pure Compact DNA extraction system (Roche, Germany). The genital ulcer specimens were collected in South Africa between 2005 and 2009 during either national microbiological surveillance activities or as part of large episodic acyclovir treatment trial (HSV4294). The re-extracted DNA was screened for the A2058G point mutation in the peptidyltransferase region of the 23S rRNA subunit using a rapid PCR-based restriction digest assay.