O03 – PERSISTENCE AND RESISTANCE

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O03.1 NATURAL HISTORY OF GENITAL AND ORAL HERPES SIMPLEX VIRUS-1 (HSV-1) SHEDDING AFTER FIRST EPISODE GENITAL HSV-1 INFECTION

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Background Genital HSV-1 has surpassed HSV-2 as a cause of first episode genital herpes in high-income settings. To inform counseling messages regarding prevention of genital HSV-1 transmission, we assessed oral and genital shedding patterns among persons with laboratory documented first episode genital HSV-1 infection.

Methods Participants with virologic evidence of first episode genital HSV-1 infection self-collected oral and genital swabs for HSV PCR and completed symptom diaries for 30 days at 2 and 11 months after the first episode. Questionnaires about sexual practices were completed. Blood samples were collected at serial timepoints to assess antibody and cellular immune responses to HSV-1. HSV serostatus was determined using the HSV Western Blot, and those who were HSV seronegative at the time of enrollment had primary infection. The per-participant risk of oral and genital HSV-1 shedding during the first and second collection periods was determined.

Results Of 62 participants who completed both swabbing sessions, 42 (68%) were women and 36 (58%) had primary HSV-1 infection. Of 54 who responded, 44 (81%) had a sex partner of the opposite gender and 43 (80%) had a single partner within 4 weeks prior to symptom onset. Genital HSV was detected on 205 (12.2%) of 1684 days at 2 months and declined significantly to 92 (5.5%) of 1668 days at 11 months (RR=0.45, 95% CI=0.24–0.85). On days when genital HSV was detected, the median quantity was higher at 11 months (4.2 log10 copies/ml) as compared to 2 months (3.2 log10 copies/ml), $p<0.0001$). HSV was detected from the mouth on 4.1% of days and stable over the first year. Genital lesions were rare during both periods (104 (2.8%) of 3687 days).

Conclusion HSV-1 genital shedding is rapidly contained after the first year of genital HSV-1 infection. Genital HSV-1 shedding is relatively infrequent, but does persist, one year after first episode infection.

Disclosure No significant relationships.

O03.2 DETECTION OF GLYCOSYLATED *TREPONEMA PALLIDUM* PROTEINS: RELEVANCE FOR DIAGNOSTIC ASSAYS AND IMPORTANCE FOR INFECTION

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Background Current serology-based, treponemal-specific diagnostic tests detect antibodies reactive against *T. pallidum* molecules and cannot differentiate between past and current syphilis infections. Further, existing diagnostic tests for syphilis have non-optimal sensitivity and specificity and require expertise for test administration and interpretation. These limitations, combined with the rising number of syphilis infections, highlight the need for a reliable direct diagnostic assay to detect active syphilis. We sought to develop such an assay using immuno-mass spectrometry to detect *T. pallidum* proteins. Our results revealed that select *T. pallidum* proteins are glycosylated.

Methods We developed antibodies directed against proteotypic, surrogate peptides from six prioritized *T. pallidum* biomarker proteins. These antibodies were tested using a technology called Stable Isotope Standards and Capture by Anti-Peptide Antibodies (SISCAPA), which involves antibody enrichment of the peptide surrogates coupled with their identification by mass spectrometry. The anti-peptide antibodies were tested by SISCAPA and in immunoblots to detect *T. pallidum* proteins in urine from patients with clinically confirmed active syphilis.

Results Immunoblot analyses consistently identified *T. pallidum* proteins in urine samples from patients with syphilis. Initially, SISCAPA technology detected the surrogate peptides in only a fraction of the urine samples. However, deglycosylation of the proteins in the urine samples prior to SISCAPA analyses allowed successful identification of the *T. pallidum* biomarkers.

Conclusion This is the first report of protein glycosylation during *T. pallidum* infection. The results show sample deglycosylation prior to SISCAPA analysis improves peptide detection and enables use of a SISCAPA-based direct diagnostic test for accurately detecting active syphilis. Further, the results suggest a potential mechanism of immune evasion used during infection, that of masking *T. pallidum* proteins from the immune system by the addition of glycosyl groups. These findings increase our understanding of *T. pallidum* infection and will assist with development of a non-invasive, sensitive and specific assay for syphilis.

Disclosure No significant relationships.