

**016.5** **CONCORDANCE OF ANAL, PENILE, AND ORAL HUMAN PAPILLOMAVIRUS HR-HPV INFECTIONS AND HPV SEROPOSITIVITY IN HIV-INFECTED AND HIV-NEGATIVE MEN WHO HAVE SEX WITH MEN: THE HIV & HPV IN MSM (H<sub>2</sub>M) STUDY**

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**Background** Infection with human papillomavirus (HPV) is not generally followed by seroconversion for reasons not yet fully understood. This cross-sectional study investigated concordance between high-risk (hr) HPV infections at three anatomical sites and concordant seropositivity, in both HIV-infected and HIV-negative men who have sex with men (MSM).

**Methods** MSM aged  $\geq 18$  years were recruited from the Amsterdam Cohort Studies, an STI clinic and an HIV treatment centre in Amsterdam, the Netherlands. The associations between anal, penile, and oral HPV infections and concordant seropositivity of 7 hr-HPV types (16, 18, 31, 33, 45, 52 and 58) were estimated using generalised estimating equations (GEE) regression analyses.

**Results** Among the 306 HIV-infected MSM 93% were hr-HPV seropositive (i.e. seropositive for at least one of the 7 hr-HPV types) and 69% were infected with at least one anal, penile, or oral hr-HPV infection. Of 441 HIV-negative MSM 74% were hr-HPV seropositive and 41% were infected with one or more hr-HPV infections. Type-specific hr-HPV seropositivity was not more likely for men with concordant infections at multiple anatomical sites (OR 1.58, 95% CI 1.06–1.86) compared to those with concordant infections at only one anatomical site (OR 1.45, 95% CI 1.22–1.73). In multi-variable analysis, adjusting for key demographic and sexual behavioural factors, type-specific hr-HPV seropositivity was associated with concordant anal hr-HPV infections (OR 1.60, 95% CI 1.32–1.92), but not with concordant penile (OR 0.79, 95% CI 0.58–1.06) or oral (OR 1.36, 95% CI 0.85–2.17) hr-HPV infections; in stratified analyses, these associations were similar for HIV-infected and HIV-negative men.

**Conclusions** In both HIV-infected and HIV-negative MSM, anal hr-HPV infections were associated with hr-HPV seropositivity, while penile and oral hr-HPV infections were not. Our findings support the hypothesis that seropositivity differs by the type of epithelium infected, implying that mucosal infection may provide a stronger signal to the immune system.

**016.6** **PRE-VACCINATION SEROPREVALENCE OF 15 HUMAN PAPILLOMAVIRUS (HPV) TYPES AMONG SLOVENIAN WOMEN SCREENED FOR CERVICAL CANCER**

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**Background** Our objective was to estimate the seroprevalence of 11 high-risk (hr) HPV types (HPV 16, 18, 31, 33, 35, 39, 45, 52, 56, 58, 59) and four low-risk (lr) HPV types (HPV 6, 11, 68, 73) among Slovenian women screened for cervical cancer before the introduction of vaccination against HPV.

**Methods** 3259 serum specimens from the Slovenian HPV prevalence survey were tested for HPV type-specific antibodies with a multiplexed pseudovirion-based serological assay (PsV-Luminex).

**Results** Seropositivity for any of the 15 HPV types was 65.7%, any of the 11 hr-HPV types 59.2%, and any of the four lr-HPV types 33.1%. Antibodies against multiple HPV types were more common (45.3%) than against single HPV types (20.4%). Antibodies against at least one of the four vaccine HPV types (HPV 6, 11, 16, and 18) were detected in 40.8% women. Among hr-HPV types seropositivity was the highest for HPV 16 (25.2%) and among lr-HPV types for HPV 6 (19.1%). Age-specific seropositivity for HPV 16 was the highest among 30–39 years old women (29.6%) and decreased with increasing age to 14.0% among 60–64 years old women ( $p = 0.014$ ). Seropositivity for any of the hr-HPV among women with pathological cytology was 76.8% and those negative for intraepithelial lesion or malignancy 58.3% ( $p < 0.001$ ).

**Conclusion** Our results show a substantial burden of lifetime sexual exposure to these 15 HPV types before the introduction of vaccination and also a relatively high cumulative exposure to at least one of the four vaccine HPV types. Thus, vaccination of females before sexual debut with a quadrivalent HPV vaccine has a potential to contribute to a substantial reduction of the burden of cervical infections and cervical cancer as well as some other HPV related morbidity, including genital warts. Our data also present the baseline for monitoring HPV long-term vaccination impact.

## 0.17 - Programme evaluation

**017.1** **INCREASED HIV PREVENTION PROGRAMME COVERAGE AND DECLINE IN HIV PREVALENCE AMONG FEMALE SEX WORKERS IN SOUTH INDIA**

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**Objectives** As one way of assessing the impact of *Avahan*, the India AIDS Initiative of the Bill & Melinda Gates Foundation, we examined the association between HIV prevention programme indicators and changes in HIV prevalence among female sex workers (FSWs) between 2006 and 2010.

**Methods** HIV prevalence among FSWs was measured in two large surveys (2006 and 2010) across 24 districts in south India ( $n \sim 11,000$  per round). A random-effect multilevel logistic regression analysis was performed using HIV as the outcome, with individual independent variables (from both surveys) at level 1 and district-level FSW-specific programme indicators (from the *Avahan* computerised monitoring system) and contextual variables (from Indian government datasets) at level 2. Program indicators included their 2006 value, the difference in their values between the surveys, and the interaction between the latter and study round. The analysis also controlled for baseline HIV prevalence and its interaction with study round.

**Results** HIV prevalence among FSWs decreased from 17.0% (round 1) to 14.2% (round 2;  $p < 0.001$ ). The odds ratio (OR) of the interaction term between the difference in programme coverage (% of FSWs contacted by the programme in a given year) and the survey round was 0.995 ( $p = 0.006$ ), indicating that increased coverage was significantly associated with the decline in HIV prevalence between rounds. ORs comparing HIV prevalence between rounds varied with the level of increase in coverage and were statistically