Title: High-risk HPV prevalence and serostatus in women living with perinatally acquired HIV (the SHiP study)

Authors: Merle Henderson[1,2*], Tamara Elliott[1,2*], Ellie Crook[2], Sara Ayres[2], Simon Beddows[3], Kavita Panwar[3], Corrina Wright[4,5], Deirdre Lyons[2], Miranda Cowen[2], Hasit Patel[5], David Smith[5], Sarah Fidler[1,2], Caroline Foster[2]

[1]Department of Infection, Imperial College London, [2]Imperial College Healthcare NHS Trust, [3]HPV Unit, UK Health Security Agency, [4]North West London Pathology, [5]Cervical Screening London, Health Service Laboratories
[*]joint first author

Background: Women living with HIV are at an increased risk of HPV-related cervical intraepithelial neoplasia and cancer, and are eligible for annual cervical screening through primary HPV testing aged 25-65 and HPV vaccination up to 40 years (BHIVA guidelines). HPV vaccines that have been available in the UK are Cervarix (HPV16/18), Gardasil (HPV6/11/16/18) and more recently the nonavalent Gardasil 9 (6/11/16/18/31/33/45/52/58). In this study we aim to explore high-risk HPV (hrHPV) prevalence and serological responses to HPV vaccination in a cohort of young women with perinatally acquired HIV (PaHIV).

Methods: Eligible people with a cervix aged 18+ living with PaHIV were recruited opportunistically. A cervical sample was taken for cytology and on-site HPV analysis using Cepheid GeneXpert (reported as negative or positive for any combination of HPV16, 18/45, or other hrHPV subtypes P3 (31/33/35/52/58), P4 (51/59) or P5 (39/56/66/68)). Vaccine history was obtained via clinical records or patient self-reported. Serum antibody binding to HPV6/11/16/18/31/33/45/52/58 virus-like particles was determined using a Luminex-based assay.

Results: 57 people were recruited: median age 25 years (range 18-34), 47 (82.5%) of black ethnicity and median CD4+ count 681 cells/μL (range 78-1600). 46 (80.7%) provided a cervical sample, and 56 (98.2%) provided serum.

14/46 (30.4%) cervical samples were hrHPV positive, none of which had high-grade changes on cytology. 2/14 (14.3%) were positive for HPV16, 0 for 18/45, 6 (42.9%) for P3, 7 (50.0%) for P4 and 4 (28.6%) for P5. 5/14 (35.7%) were positive for multiple subtypes. Of the 2 positive for HPV16, 1 was HPV unvaccinated and 1 had unconfirmed vaccine status. 9/12 (75.0%) positive for other hrHPV subtypes were HPV vaccinated.

Of the 40/57 (70.2%) who received HPV vaccination, 39 had HPV serological analysis; 29/39 (74.4%) were consistent with receiving Cervarix/Gardasil, but 10/39 (25.6%) were seronegative for one or both of HPV 16/18.

Conclusion: In this small observational cohort study, 30% were positive for hrHPV and only 70% received HPV vaccination despite being eligible. Reassuringly, none of the vaccinated participants tested positive for hrHPV 16/18, but 22.5% of those vaccinated tested positive for other hrHPV subtypes, suggesting a potential benefit of the nonavalent vaccine in this vulnerable cohort.