

## Genital infection with HPV in men: translating research into practice

[A: we need the title to fit on 1 line, and you can have 60 characters, including white spaces; is the above ok?]

In *The Lancet*, Anna Giuliano and colleagues<sup>1</sup> [A: I've added the ref details and renumbered the refs] present a prospective study (HPV in Men [HIM]) of the incidence and clearance of human papillomavirus (HPV) infections in men. They also report on male sexual behaviour, which determines HPV incidence and clearance [A: just to explain, "male"/"female" only used as an adjective]. The epidemiology of HPV infections in men is not well understood and thus the results are of substantial interest.

The results bring to light important new information, and draw attention to differences between the natural histories of male and female HPV infections and the need for further studies to better define HPV transmission, progression to disease, and epithelial sites in men [A: okay (all three in men)?]. Because HPV infection in men greatly affects disease risk in women,<sup>2</sup> transmission and protection are important topics. However, circumcision and condom use have not been clearly shown to fully protect against either HPV acquisition or clearance in male genital sites,<sup>3,4</sup> questioning their value in preventing infection in men and transmission to female partners.

Understanding male HPV infection is important to minimise anxiety and health-care costs associated with genital warts, penile cancer treatment, and morbidity in men, in addition to addressing the acknowledged public health concern created by HPV infection in women. The HIM data on HPV incidence and clearance should be exploited to elaborate prevention guidance, and to minimise transmission and to aid management and associated concerns for couples. This [A: what is the "this" there?] underlines the importance of male HPV vaccination (which is reasonably safe [A: OK to rephrase like that?]) and because infection with HPV is the most common infection in men. [A: did you mean that HPV infection is the most common sexually transmitted disease in men?]

Apart from genital warts, which are induced in more than 90% of cases by HPV types 6 and 11, with an estimated prevalence of about 1% before age

30 years, and which are equally common in boys and girls [A: shouldn't this be "men and women"?], other HPV-linked genital neoplasia in men are rare. Penile intraepithelial neoplasia is 10–20 times less frequent than is cervical intraepithelial neoplasia (CIN), and HPV-induced cancers of the penis are extremely rare, with an incidence of less than one in 100 000.<sup>5</sup> The data from HIM clearly show that the natural history of HPV infection progressing [A: OK to rephrase like that?] to disease differs between men and women, with high infection and low disease rates in men and low infection and high disease rates in women. The natural history of oncogenic HPV infections in men should not be extrapolated to that seen in the cervical transformation zone. This highly attenuated susceptibility to HPV in men is probably due to local (mucosa vs skin) and immunological causes. Nonetheless, these diseases can also emerge in men because of immunosuppression.<sup>6</sup>

Controversy remains over the use of condoms to protect against HPV transmission. Cross-sectional studies suggest that condoms offer little protection against HPV infection,<sup>3,4</sup> whereas consistent and high-frequency use of condoms can reduce the risk of HPV infection<sup>7</sup> and CIN, with protection estimated in one prospective study at 70% for new infections.<sup>8</sup>

Discrepancies could be explained by the fact that genital HPV transmission can occur by contact other

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than vaginal intercourse, full condom coverage is not constant, and condoms reduce the risk of major HPV transmission from genital warts, in which viral replication is high (in our experience, similar lesions were seen in the partners of 50% of cases). By contrast, CIN in women is not associated with penile lesions in their male partner in more than 95% of cases.<sup>9</sup> Also, treatment of genital HPV diseases in men does not affect the natural history or recurrence of CIN in female partners.<sup>10</sup> Furthermore, with the longer duration of HPV infection, particularly CIN, in women than in men (Giuliano and colleagues report that in more than 90% of men at 24 months [A: I copied this from the paper], HPV had already cleared at the time of CIN diagnosis [A: there's no mention of CIN diagnosis in Giuliano's paper?], being a median of 7.52 months for all HPV types and 12.19 months for HPV 16), use of condoms as a protective measure or of a urethral swab in the male partner [A: ok to phrase like that, as we do not know what an "androscope" is?] the time of an abnormal cervical smear [A: OK?] add little value in this context.

Existing limitations for the prevention of HPV transmission from men to women by use of condoms or circumcision have yet to be resolved. Vaccination is an effective means to protect men against lesions associated with the vaccineable HPV types, particularly genital warts and anal intraepithelial neoplasia [A: OK, is that what AIN is?].<sup>11,12</sup> Genital warts are common, debilitating to young couples, difficult to treat, and costly to manage.<sup>13</sup> The cost-benefit ratio of vaccinating men to protect women from cervical neoplasia yet to be definitively established. However, as more diseases are prevented through male vaccination, notably anal cancer, the greater the cost-effectiveness of routine vaccination of both sexes.<sup>14</sup>

Although we will continue to encourage protective measures, condom use and safe sex practices are of little value in clinical practice, with prevention of HPV

transmission and its consequences still unconfirmed. HPV vaccination of men will protect not only them but will also have implications for their sexual partners.

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