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Original Research Article

ANOGENITAL WARTS AND MISSED OPPORTUNITIES FOR HPV PREVENTION AMONG MEN WHO HAVE SEX WITH MEN: A CLINIC-BASED STUDY

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ABSTRACT

Background: Men who have sex with men (MSM) carry a disproportionate burden of human papillomavirus (HPV)–related disease, including anogenital warts (AGW) and anal cancer, yet remain largely outside India's cervical-cancer–centred, female-focused vaccination effort and continue to rely on a prevention model built around condom promotion. We examined the burden of AGW and the gap between condom awareness, condom practice, and HPV-vaccine awareness and uptake in this population.

Materials and Methods: A hospital-based cross-sectional study was conducted among 72 self-reporting MSM attending the dermatology and venereology outpatient clinic of Government Medical College, Thiruvananthapuram, Kerala, India. Participants underwent clinical examination for AGW, serological and microbiological screening for other sexually transmitted infections (STIs), and a structured knowledge–attitude–practice assessment of barrier contraception and HPV vaccination. Categorical associations were tested using the chi-square test.

Results: AGW were present in 11 of 72 participants (15.3%), and 61 (84.7%) had at least one STI, most commonly syphilis (73.6%) and HIV (33.3%); AGW frequently co-occurred with these infections. Although all participants (100%) were aware of condoms, only 9.7% used them consistently, while 90.3% reported both protected and unprotected encounters. Awareness of the HPV vaccine was low (18.1%), and none of the 72 participants reported prior vaccination. Better awareness was associated only with higher education and consistent condom use ($p < 0.01$).

Conclusion: This population showed a substantial AGW and STI burden alongside near-absent HPV-specific primary prevention. Because condoms reduce but cannot eliminate HPV transmission—owing to skin-to-skin spread at uncovered sites and to slippage or breakage—HPV vaccination offers the complementary protection that barrier methods alone cannot. Embedding routine AGW screening, consistent-use condom counselling, and proactive, MSM-inclusive HPV vaccination into existing STI and HIV services represents a critical and currently missed opportunity.

Keywords: Anogenital warts, HPV vaccination, Men who have sex with men, Barrier contraception, sexually transmitted infections.

INTRODUCTION

Human papillomavirus (HPV) is among the most common sexually transmitted infections worldwide, and its clinical consequences span a wide arc—from benign but distressing anogenital warts (AGW) to invasive anal, penile, and oropharyngeal cancers.[1,2] Men who have sex with men (MSM) sit at the sharp end of this spectrum. Anal HPV prevalence in this group is strikingly high, and the associated risk of

high-grade intraepithelial lesions and anal cancer approaches, in some settings, the cervical cancer risk that drives vaccination policy for women.[3] The susceptibility is both anatomical and biological: receptive anal intercourse exposes a vulnerable transition zone, and concurrent HIV infection—common in this population—impairs HPV clearance and fuels persistence, recurrence, and progression of disease.[4]

AGW are the visible, and clinically the most actionable, manifestation of this burden. They are a marker of ongoing HPV transmission, a frequent companion of other STIs, and a recognised source of psychosexual morbidity.[5] International cohorts and clinic-based Indian series alike have reported AGW in a sizeable minority of MSM, far above the prevalence seen in the general male population.[6,7,8] Despite this, granular Indian data—particularly from Kerala, a state with mature HIV-prevention infrastructure but limited MSM-specific HPV literature—remain sparse.[9]

India's HPV-prevention narrative has, until recently, been almost entirely a cervical-cancer narrative, and therefore a female-focused one.[10] The arrival of an affordable indigenous quadrivalent vaccine has widened what is programmatically feasible, yet the operational emphasis remains adolescent girls.[11] For MSM, who derive little benefit from the herd protection generated by vaccinating girls, the de facto prevention strategy continues to be condom promotion delivered through HIV-era targeted-intervention programmes.[12] This matters because condoms, though indispensable for HIV and for the fluid-borne bacterial STIs, are an inherently incomplete barrier to HPV: the virus spreads by skin-to-skin contact across perineal, scrotal, and perianal surfaces that a condom never covers, and even correct use is undone by slippage or breakage.[13]

The result is a prevention architecture that leans heavily on the one tool that cannot fully contain HPV, while neglecting the one that was designed to. We therefore undertook a clinic-based cross-sectional study among MSM attending a tertiary dermatology and venereology service in southern India, with two aims: to quantify the burden of AGW and co-existing STIs, and to characterise the gap between awareness and practice of barrier contraception and between awareness and uptake of HPV vaccination—in order to locate, concretely, where the prevention opportunity is being missed.

MATERIALS AND METHODS

Study design and setting: This was a hospital-based, descriptive cross-sectional study conducted in the outpatient Department of Dermatology and Venereology of Government Medical College, Thiruvananthapuram, Kerala, India, between September 2024 and December 2025. Reporting follows the STROBE recommendations for observational studies.

Participants and sampling: Self-reporting MSM aged 18 years and above who attended the outpatient clinic during the study period and consented to participate were recruited consecutively until the required sample size was met. Individuals unwilling to provide informed consent were excluded. The sample size of 72 was derived from the highest of the precision-based estimates for the study's key proportions—awareness of HPV vaccination and of barrier contraception—assuming an absolute precision of 10%.

Data collection

Sociodemographic details, sexual history (orientation, marital status, number of partners, sexual role, and pattern of condom use), and substance use were recorded using a semi-structured proforma. All participants underwent a detailed clinical examination for AGW; lesions that were diagnostically uncertain, pigmented, or ulcerated were biopsied. Participants were referred to the Integrated Counselling and Testing Centre for HIV testing and to the STI laboratory for serological testing for syphilis and viral hepatitis; urethral discharge, where present, was examined by Gram stain, wet mount, and potassium hydroxide preparation. Knowledge of, attitudes toward, and practices relating to barrier contraception and HPV vaccination were assessed with a structured questionnaire, and overall awareness was graded as poor, moderate, or good.

Statistical analysis

Categorical variables were summarised as frequencies and percentages. Associations between the presence of AGW, or the level of awareness, and selected demographic and behavioural variables were examined using the chi-square test, with a two-sided p value below 0.05 considered statistically significant.

Ethical considerations

The study was approved by the Institutional Ethics Committee. Written informed consent was obtained from every participant, and confidentiality of identity and clinical information was maintained throughout.

RESULTS

Seventy-two consenting MSM were enrolled. The population was young and sexually active: 54.2% were aged 21–30 years, and individuals aged 21–50 years accounted for more than 94% of the sample. Nearly three-quarters identified as bisexual (73.6%), most were unmarried (70.8%), and high-risk behaviour was the norm—the majority reported multiple partners (87.5%) and both active and passive sexual roles (68.1%). The characteristics of the cohort are summarised in [Table 1].

Table 1: Sociodemographic and behavioural characteristics of the study population (N = 72)

Characteristic	n (%)
Age 21–30 years	39 (54.2)
Age 31–40 years	16 (22.2)
Age 41–50 years	13 (18.1)
Other age groups (≤20, 51–60 years)	4 (5.6)
Unmarried	51 (70.8)
Bisexual orientation	53 (73.6)
Multiple sexual partners	63 (87.5)
Both active and passive role	49 (68.1)
Any substance use	18 (25.0)

Burden of anogenital warts and co-existing STIs

AGW were clinically evident in 11 of 72 participants, a prevalence of 15.3%—approximately one in seven men examined. The wider STI burden was heavy: 61 participants (84.7%) had at least one STI. Syphilis was the most frequent (73.6%), followed by HIV (33.3%), with AGW the third most common diagnosis. Among the 11 men with AGW, lesions involved both anal and genital sites in the great majority, and most had a co-existing STI, most often syphilis or HIV. These findings are presented in [Table 2].

Table 2: Prevalence of anogenital warts and co-existing sexually transmitted infections (N = 72). Categories are not mutually exclusive owing to co-infection

Infection	n (%)
Any STI (≥1)	61 (84.7)
Syphilis (any stage)	53 (73.6)
HIV	24 (33.3)
Anogenital warts	11 (15.3)
Herpes genitalis	2 (2.8)
Molluscumcontagiosum	1 (1.4)

No statistically significant association emerged between the presence of AGW and any demographic or behavioural variable examined ($P > 0.05$ for all). Nonetheless, AGW were proportionally more common among younger and unmarried men, those with multiple partners, and those reporting passive or versatile roles—trends that are biologically coherent even though the study was underpowered to confirm them.

The prevention gap: condoms and the HPV vaccine

Awareness of barrier contraception was universal: all 72 participants knew of condoms. Practice, however, diverged sharply from knowledge. Only 9.7% reported consistent condom use, while 90.3% reported a mixture of protected and unprotected encounters. Awareness of the HPV vaccine was strikingly low at 18.1%, and—critically—none of the 72 participants reported ever having been vaccinated. Taken together as a composite measure, 83.3% of the cohort were categorised as having poor awareness of HPV prevention. On bivariate analysis, only higher educational attainment ($\chi^2 = 19.81$) and consistent condom use ($\chi^2 = 16.74$) were significantly associated with better awareness ($P < 0.01$); age, marital status, number of partners, sexual role, substance use, and the presence of other STIs were not.

DISCUSSION

Three findings stand out from this cohort, and they are best read together rather than separately. AGW were present in roughly one in seven men, embedded within a population in which more than four in five carried another STI; condoms were universally known but consistently used by fewer than one in ten; and the HPV vaccine, the single intervention designed to prevent the disease we were measuring, was known to a small minority and had been received by no one. The prevention effort reaching these men, in other words, rests almost entirely on the one tool that cannot by itself contain HPV.

The AGW prevalence of 15.3% sits an order of magnitude above estimates for the general Indian male population and within the 7–37% range reported from MSM clinic populations internationally and in India.[5,8,9] The accompanying STI burden—syphilis in nearly three-quarters and HIV in a third—exceeds that of several comparator cohorts.[14,15] The clustering of AGW with HIV is expected and mechanistically important: HIV-associated immunosuppression impairs HPV clearance and amplifies the persistence and recurrence that ultimately drive anal neoplasia.[4] As a clinic-based sample, this group almost certainly represents the higher-risk end of the MSM spectrum, and the prevalence figures should be read as those of care-seeking, symptomatic men rather than of the community at large.

The condom finding is the crux of the prevention argument. Universal awareness alongside roughly 10% consistent use is itself a familiar and sobering gap, attributable to partner trust, stigma, substance use, and reduced pleasure—and it reflects two decades of HIV-focused condom promotion that has succeeded in spreading the message but not the practice.[13,16] Yet even a hypothetical cohort with perfect adherence would remain incompletely

protected against HPV. Unlike HIV and the fluid-borne bacterial STIs, HPV transmits through contact with skin that condoms do not cover, and the residual risk is compounded by the everyday realities of slippage and breakage.[13] This is not an argument against condoms, which remain essential; it is an argument that condoms are, for HPV specifically, a single and structurally insufficient layer of defence.

It is precisely that residual, condom-resistant risk that vaccination is built to close, which is what makes the second gap so consequential. Awareness of the vaccine reached only 18.1%, and uptake was nil. This is the predictable downstream effect of a national HPV discourse framed around cervical cancer and delivered to adolescent girls, in which boys and MSM appear neither as beneficiaries nor as a target group.[10,11] The clinical case for vaccinating MSM is strong: the vaccines are highly efficacious against the genotypes responsible for the majority of AGW and HPV-related cancers,[17] MSM gain little from girls-only herd immunity,[3] and the affordability barrier in India has been substantially lowered by indigenous vaccine supply.[11] Framed correctly, vaccination is not an alternative to condoms but the complementary second layer of a combination-prevention strategy—covering exactly the uncovered-site transmission and barrier failures that condoms cannot. Awareness studies among gay and bisexual men elsewhere report the same disconnect between general HPV awareness and specific vaccine knowledge,[18,19,20] and Indian acceptability data suggest that, once informed, uptake intentions are favourable.[21]

That awareness tracked with education and with consistent condom use, rather than with any marker of risk, is also instructive. Health literacy appears to cluster—those already practising safer behaviour are also those who know more—while the men at highest behavioural risk are the least informed. Demographic targeting will therefore miss the people who most need reaching; what is required instead is active, MSM-friendly education delivered through the services these men already attend.

The operational implication is concrete and, in the Kerala context, achievable. The STI clinic and the Integrated Counselling and Testing Centre are existing, trusted points of contact. Each visit for an AGW or a syphilis serology is an opportunity to examine for warts, to move condom counselling from awareness toward consistent and correct use, and to introduce HPV vaccination—supported now by an affordable domestic product—as a routine recommendation rather than an afterthought. Provider training to discuss HPV beyond cervical cancer, and peer and digital outreach to reach men who do not attend clinics, would extend that reach further.

Limitations

Several limitations temper these findings. The single-centre, clinic-based design introduces selection toward higher-risk, care-seeking men and limits generalisability to community MSM. The sample of 72, while adequate for the primary prevalence estimates, was underpowered to detect associations with AGW, which likely explains the absence of statistical significance despite coherent trends. The cross-sectional design precludes causal or temporal inference. Behavioural data and vaccination status were self-reported and therefore subject to social-desirability and recall bias; vaccine uptake in particular was not independently verified. Finally, HPV genotyping was not performed, so the distribution of circulating types—and their match to available vaccines—could not be assessed.

Future directions

Multi-centre and community-based sampling would clarify the true population prevalence, and HPV genotyping would inform vaccine valency decisions for Indian MSM. Most usefully, a pilot of opportunistic HPV vaccination embedded within STI and HIV services—with uptake, completion, and cost-effectiveness as endpoints—would convert the missed opportunity identified here into testable practice.

CONCLUSION

Among MSM attending a tertiary dermatology service in Thiruvananthapuram, Kerala, anogenital warts were common and set within a heavy burden of co-existing STIs, while HPV-specific primary prevention was almost entirely absent: condom use was inconsistent despite universal awareness, and not one participant had been vaccinated. Because condoms reduce but cannot eliminate HPV transmission, they cannot, on their own, protect this population.

HPV vaccination supplies precisely the protection condoms leave open, and the gap between 18% awareness and zero uptake represents a clear, modifiable failure of primary prevention. Integrating AGW screening, consistent-use condom counselling, and proactive, MSM-inclusive HPV vaccination into the STI and HIV services these men already use is an achievable next step toward closing it.

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