REVIEW ARTICLE

Anogenital papillomavirus infection in military personnel: epidemiology, surgical treatment and follow-up

Akmal M. Fayziev[1*]

[1]*Military Medical Institute, University of Military Security and Defense of the Republic of Uzbekistan, Tashkent, Republic of Uzbekistan*

*Corresponding author: Akmal M. Fayziev; e-mail: nagaeva.gulnora@mail.ru

Abstract

Background. Human papillomavirus (HPV) infection is most prevalent in young men, who make up the bulk of military personnel, yet data on this infection in servicemen are limited.

Aim. To summarise current evidence on the prevalence, risk factors, screening for anal intraepithelial neoplasia, surgical treatment and follow-up of anogenital HPV infection as applied to military units.

Methods. Review of publications indexed in PubMed/MEDLINE, the Cochrane Library and eLIBRARY, prioritising systematic reviews, randomised trials and clinical guidelines.

Results. Genital HPV is detected in 31% of men and high-risk types in 21%, with a peak at 25–29 years. The incidence of anogenital warts is 160–289 per 100,000 per year, and their prevalence on targeted examination is several times higher than in treatment records. HPV is associated with 88% of anal cancers; treatment of anal high-grade squamous intraepithelial lesions reduces cancer risk by 57%. Surgical methods clear lesions in almost 100% of cases, but recurrences occur in 20–30% or more. The 2024 anal cancer screening guidelines do not cover organised communities of young men. Military service conditions favour late detection. A staged system of screening in the unit, surgical treatment in the military hospital and follow-up at 3, 6 and 12 months is proposed.

Conclusion. Studies of the prevalence and risk factors of anogenital HPV infection in servicemen, comparison of surgical methods by clinical and service outcomes, and prospective evaluation of the proposed follow-up system are needed.

Keywords: *human papillomavirus; condylomata acuminata; anal intraepithelial neoplasia; military personnel; surgical treatment; follow-up.*

MAIN TEXT

Introduction

Human papillomavirus (HPV) infection is the most common viral sexually transmitted infection [1, 2]. According to a meta-analysis of 65 studies from 35 countries, at least one genital HPV type is detected in 31% of men aged 15 years and older and high-risk types in 21%, with peak prevalence at 25–29 years [3, 4]. The incidence of anogenital warts (condylomata acuminata),

caused mainly by HPV types 6 and 11, is 160–289 cases per 100,000 population per year, with a peak in men also at 25–29 years [5]. Because young men make up the bulk of military personnel, anogenital HPV infection is a relevant problem for military medicine.

The aim of this review was to summarise current evidence on the prevalence, risk factors, diagnosis of anal intraepithelial neoplasia, surgical treatment and follow-up of anogenital HPV infection as applied to organised military communities.

Methods

Publications were searched in PubMed/MEDLINE, the Cochrane Library and eLIBRARY using the keywords “human papillomavirus”, “anogenital warts”, “anal intraepithelial neoplasia”, “anal cancer screening” and “military personnel”. Priority was given to systematic reviews, meta-analyses, randomised trials and clinical guidelines.

Epidemiology and natural history of infection in men

In the HIM cohort study of men from the USA, Brazil and Mexico, the incidence of new genital HPV infections was high in all age groups, and most infections cleared within a year, reflecting continuous circulation of the virus in the sexually active male population [6–8]. The prevalence of anogenital warts depends substantially on the method of ascertainment: 0.13–0.56% in medical records and 0.2–5.1% on targeted genital examination [5]. This difference is crucial for military medicine, since registration based on presentation inevitably underestimates the true frequency of disease. The natural history of anogenital warts is variable: some lesions regress spontaneously, while others persist [9].

HPV is associated with 88% of anal cancers [10, 11]. The risk of anal cancer differs sharply between population groups: it is highest in men who have sex with men and people living with HIV and remains low in men of the general population [12–14]. The precancerous condition is anal intraepithelial neoplasia (AIN), which may remain asymptomatic for a long time; according to the unified LAST terminology, low-grade (LSIL) and high-grade (HSIL) squamous intraepithelial lesions are distinguished [15].

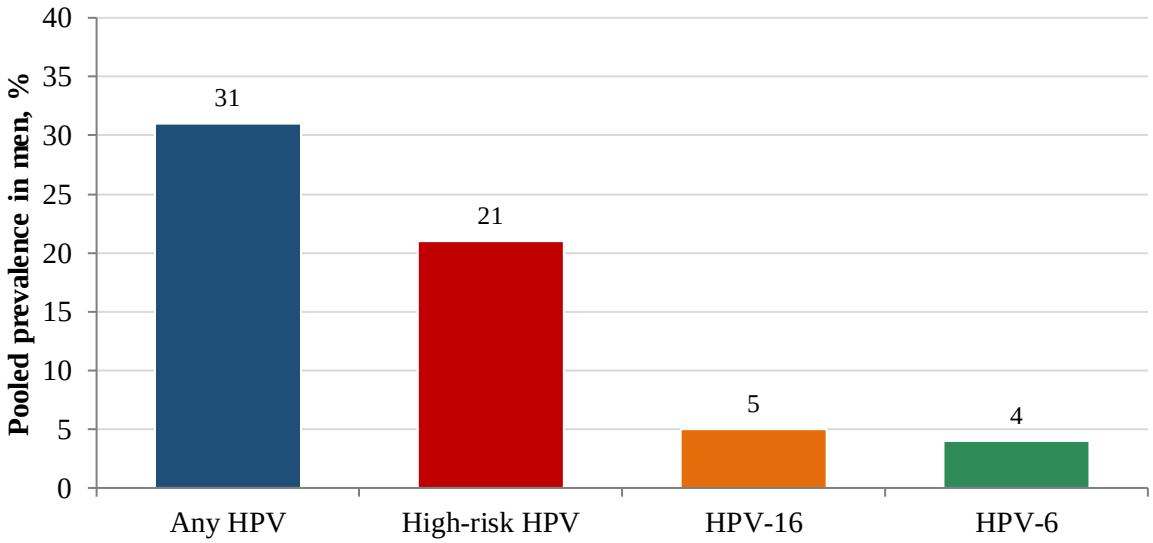


Figure 1. Pooled prevalence of genital HPV infection in men aged 15 years and older according to a meta-analysis of 65 studies (44,769 men) [3].

Military personnel as a risk group

Features of military communities that favour the spread and late detection of the disease include young age, long separation from family, service in field conditions far from specialised proctological and dermatovenereological care, and late presentation because of the sensitive nature of the problem. In the Republic of Uzbekistan, HPV vaccination was included in the national immunisation schedule in 2019 for 9-year-old girls only, so the current generation of servicemen is not protected by vaccination. Data on the prevalence of anogenital HPV infection, its risk factors and the frequency of AIN in servicemen of the Armed Forces of the Republic of Uzbekistan are lacking in the available literature.

Screening for anal intraepithelial neoplasia

The randomised ANCHOR trial in people living with HIV showed that treatment of anal HSIL reduced the risk of progression to anal cancer by 57% compared with active monitoring [16]. On this evidence base, the International Anal Neoplasia Society (IANS) published the first consensus guidelines for anal cancer screening in 2024, defining risk groups, the age to start screening and the role of cytology, high-risk HPV testing and high-resolution anoscopy [17]. Persons older than 45 years with a history of perianal warts were classified as a group in whom screening may be considered through shared decision-making when high-resolution anoscopy is available [17]. Screening criteria for organised communities of young men, including servicemen, have not been defined.

Surgical treatment and recurrence

European guidelines distinguish ablative methods (excision, electrosurgery, laser and radiofrequency ablation, cryotherapy) and topical therapies [18]; surgical methods provide the highest primary clearance rates, approaching 100% [19, 20]. However, regardless of the method, the disease recurs in 20–30% of cases or more [19, 20]. A systematic review and economic evaluation of interventions for anogenital warts confirmed that no method is superior to the others for all outcomes and highlighted the importance of recurrence for treatment costs [21]. Some recurrences may be related to undetected lesions in the anal canal when anoscopy is not performed. Histological examination of excised tissue is recommended for atypical, pigmented, bleeding or treatment-resistant lesions [20, 22], but it is not mandatory everywhere.

Anogenital warts substantially reduce health-related quality of life [23]. For servicemen, not only clearance and recurrence rates but also healing time, length of hospital stay and time to return to duty are important. Comparative data on different surgical methods for these outcomes in servicemen are lacking.

Prevention

The quadrivalent vaccine reduced the incidence of external genital lesions associated with HPV 6/11/16/18 in men aged 16–26 years [24] and the incidence of vaccine-type AIN in men who have sex with men [25]. These data relate to primary prevention in previously uninfected individuals and do not replace active detection and treatment of existing infection. Population-level vaccination programmes have led to a marked decline in anogenital warts, including in unvaccinated men through herd protection [26].

Proposed model of care

On the basis of the reviewed evidence, a three-stage system of "screening in the military unit — surgical treatment in the military hospital — follow-up" is proposed for military communities (Table 1). The model is a hypothesis and requires prospective evaluation; its effectiveness is to be assessed by recurrence rates, readmissions and time to return to duty.

Table 1. Proposed staged system for detection, treatment and follow-up of anogenital HPV infection in servicemen

Stage	Setting and staff	Content
1. Active detection	Unit medical post; in-depth medical examination	Anonymous questionnaire, examination of the anogenital area, anoscopy with 3–5% acetic acid when indicated, referral to hospital
2. Surgical treatment	Military hospital; surgeon (proctologist)	Choice of method (electroexcision, radiofrequency excision, laser ablation)

Stage	Setting and staff	Content
		according to lesion location and extent and presence of AIN; HPV genotyping; histological examination of all excised tissue
3. Follow-up	Unit physician and hospital	Follow-up visits with anoscopy at 3, 6 and 12 months; follow-up groups; criteria for discharge from follow-up; testing for concomitant sexually transmitted infections

The model was formulated by the author on the basis of published evidence [17, 19, 20, 22] and is subject to prospective evaluation.

Conclusion

Anogenital HPV infection is widespread among young men, who make up most military personnel; it is characterised by a high recurrence rate after any treatment method and is in some cases associated with anal intraepithelial neoplasia. Existing screening guidelines target high-risk groups and do not address the specific features of military communities. Studies of prevalence and risk factors in servicemen, comparison of surgical methods by clinical and service outcomes, and prospective evaluation of a staged system of detection, treatment and follow-up are needed.

Additional information

Author contributions. The author performed the compilation and layout of this material.

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Information about the authors

Akmal M. Fayziev — PhD candidate, Military Medical Institute, University of Military Security and Defense of the Republic of Uzbekistan, Tashkent, Republic of Uzbekistan