



Rates and predictors of genital warts burden in the Czech population



Marek Petráš^{a,*}, Věra Adámková^b

^a Charles University in Prague, Second Faculty of Medicine, V Úvalu 84, 150 06 Prague 5, Czech Republic

^b Institute for Clinical and Experimental Medicine, Prague, Czech Republic

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SUMMARY

Objective: To describe the burden and the predictors of genital warts (GWs) in Czech men and women. **Methods:** A population-based cross-sectional study was conducted of 32 974 randomly selected health clinic attendees from all 14 regions of the Czech Republic. Information on GWs and lifestyle behaviour was collected using a questionnaire.

Results: Results revealed a 5.8% prevalence rate of self-reported GWs in the Czech population aged 16–55 years. There was an increase in the incidence of GWs in the years 2010–2013 when compared to lifetime incidence rates, from 205.4 (95% confidence interval (CI) 191.0–219.7) to 441.8 (95% CI 393.1–490.6) per 100 000 person-years. No significant differences were observed between genders. The strongest risk factors found for GWs were an infected sexual partner (adjusted odds ratio (OR) 114.3, 95% CI 78.9–165.4) and a high number of lifetime sexual partners (adjusted OR 3.36, 95% CI 2.72–4.17 for >14 partners vs. one partner). A novel finding was that 22.7% (95% CI 20.9–24.6%) of participants claimed that the pathology had disappeared spontaneously without medical assistance.

Conclusions: The results provide baseline information for the development and monitoring of prevention strategies against GWs in the Czech Republic.

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1. Introduction

Genital human papillomavirus (HPV) causes broad morbidity among men and women, ranging from cancer to genital warts (GWs). Although the latter disease is not life-threatening, the lesions can cause not only clinical symptoms, such as burning, itching, bleeding, and pain, but also psychosocial stress, embarrassment, and anxiety.^{1,2} Two HPV types (HPV6 and 11) cause up to 90% of all GWs cases.³

Links between GWs and various health-related behaviours and lifestyle factors have been suggested by other investigators, and there is now widespread concern regarding the growing problem of GWs.^{4–6} Despite the existence of several works on the prevalence and incidence of GWs, only a few have provided data on the general population.^{5,7,8} As such, new knowledge on the overall rates and dynamic acquisition of GWs in the general population is crucial in order to develop national strategies to control and prevent HPV infection. This has become even more relevant since a prophylactic quadrivalent vaccine (4HPV) against HPV6, 11, 16, and 18 has become available.⁹ The same prevention

of GWs is expected from new 9-valent HPV vaccine, which includes the HPV types in the 4HPV vaccine and five additional oncogenic types (31, 33, 45, 52, and 58).¹⁰ Of note, the absence of a response against antigens HPV6 and 11 indicated that the bivalent vaccine (2HPV) against HPV16 and 18 could never fully control GWs. For this reason, routine HPV vaccination in the United Kingdom was switched from the bivalent to the quadrivalent vaccine.

The objective of this study was to describe the prevalence and incidence rates of GWs in the Czech Republic using a questionnaire survey that captures a larger cross-section of the general population than clinic-based data. The study also sought to identify and evaluate predictors for the pathology.

2. Materials and methods

2.1. Study population

A cross-sectional survey on GWs was conducted in all 14 regions of the Czech Republic. Volunteers were recruited randomly from people attending outpatient health clinics and were offered a paper-based self-administered questionnaire. To guarantee confidentiality, participants were asked to seal the completed questionnaire in an envelope supplied for this purpose. Physicians or parents could complete the survey for children or adolescents

* Corresponding author. Tel.: +420 777 324 641.
E-mail address: petras@vakciny.net (M. Petráš).

younger than 18 years of age. The goal was to include at least 1500 participants from each region.

Between January 2013 and March 2014, valid data were collected from 32 974 attendees at 268 outpatient clinics who agreed to engage in the survey. Paediatricians ($n = 166$), gynaecologists ($n = 57$), and other specialists including dermatologists and allergists ($n = 45$) were involved, as well as immunization and transfusion centres. The percentage of subjects in each region ranged from 5% to 11%. The study was approved by the Executive Committee of Preventive Medicine at Charles University in Prague.

2.2. Data collection

The questionnaire enquired on several lifestyle factors, including residence (rural or urban), education, smoking (age when first started smoking and number of cigarettes per day), number of lifetime sexual partners, and HPV immunization status (also type of commercial HPV vaccine received, year of last dose, and if they had received all three doses), as well as date of birth and gender.

Information on GWs was obtained with the question, “Have you ever had genital warts?” Study participants were also asked for the year of their first outbreak of GWs and of recurrent episodes if any occurred, the treatments received, and the GWs status of their sexual partner. The questionnaire also contained six illustrative pictures representing three different types of GWs for men and women, from which the respondents had to choose the one most similar to theirs.

2.3. Statistical analysis

The overall and age-specific lifetime prevalence of self-reported GWs was estimated with a 95% confidence interval (CI). Associations between the various lifestyle factors and GWs were examined using univariate and multiple logistic regression, from which odds ratios (ORs) and the corresponding 95% CIs were estimated. The multivariate analysis of the effects of different lifestyle factors on GWs prevalence was initially performed separately for the two genders, but data were later pooled as no statistically significant differences were found between the two gender groups.

Incidence rates were calculated as the number of GWs claims divided by the total person-years at risk (reported per 100 000 person-years). Person-time started to accumulate at birth and ended at the date of the first GWs episode, or, if none had occurred, at the survey date.

Analyses were performed using StatsDirect Statistical Software, version 3.0.117 (StatsDirect Ltd, UK).

3. Results

Study participants had a mean age of 35.8 years (95% CI 35.7–35.9 years), with only 1.0% (95% CI 0.9–1.1%) aged 15 years or younger and less than 6% older than 56 years of age (up to 80 years of age). Most of the participants were in the age group 16–55 years, i.e. 93.1% (95% CI 92.9–93.4%). Subjects were studied in 5-year age groups. The study population consisted predominantly of women (81.4%, 95% CI 81.0–81.8%).

Current smoking was 25.2% (95% CI 24.7–25.6%) and was more frequent in men than in women (age adjusted OR 1.4, 95% CI 1.3–1.5). More than 90% of adults aged 23 years or older had a minimum basic level of schooling of 13 years (high school). The median lifetime number of sexual partners was three for both genders, with a mean of 11.1 (95% CI 6.0–16.2) for men and 4.3 (95% CI 4.2–4.3) for women. While the majority of the study population lived in urban areas (77.7%; 95% CI 77.2–78.2%), there

was no difference in age distribution between urban and rural residents (age adjusted OR 1.0, 95% CI 0.97–1.03).

Interestingly, despite the low HPV vaccination rate in the study population (7.2%, 95% CI 6.9–7.5%), 29.4% (95% CI 28.1–30.7%) of girls and young women aged 11–25 years had been immunized. Although the HPV vaccination rate of men was submarginal, i.e. 0.8% (95% CI 0.6–1.1%), no man reported the acquisition of GWs after immunization.

Overall, 1968 participants (6.0%, 95% CI 5.7–6.2%) reported one or more episodes of GWs. The lifetime prevalence of self-reported GWs was independent of gender, with rates of 5.7% (95% CI 5.2–6.3%) for men and 6.0% (95% CI 5.7–6.3%) for women. The prevalence rate was not different between men and women with regard to their age, number of sexual partners or sexual partner having ever had GWs, area of residence, or smoking habit (Table 1).

Of the participants with clinically diagnosed GWs, 76.2% (74.3–78.1%) reported having required treatment with topical cytotoxic agents and/or ablative techniques, while 22.7% (95% CI 20.9–24.6%) claimed that the pathology disappeared without medical assistance.

The prevalence of self-reported GWs increased with age, peaking at 7.6% (95% CI 6.9–8.4%) in the age group 26–30 years, after which it declined to 4.9% (95% CI 4.0–6.0%) in the oldest age group. The sex-, age- and region-standardized GWs prevalence rate reached 5.8% (95% CI 5.4–6.2%) in the Czech population aged 16–55 years.

The lifetime incidence rate of GWs per 100 000 persons-years was 165.7 (95% CI 158.4–173.1) for the study participants and 141.6 (95% CI 158.4–173.1) for the Czech population. This rate increased to 291.6 (95% CI 278.7–305.1) in the study and 205.4 (95% CI 191.0–219.7) in the Czech population when only individuals aged 16–55 years were considered. A slightly lower incidence was found in men than in women, but this was not statistically significant, i.e. OR 1.11 (95% CI 0.99–1.26) for study participants and 1.12 (95% CI 0.97–1.28) for the Czech population.

The sex- and age-standardized incidence rate between the years 2010 and 2013 was 441.8 (95% CI 393.1–490.6) per 100 000 persons-years at risk, revealing an increasing tendency for GWs infection among the population aged 16–55 years during this period when compared with lifetime rates. This observation was further supported by the increase, in 2013, of first GWs infections: up to 0.83% (95% CI 0.67–1.03%) among subjects aged 16–35 years and 0.58% (95% CI 0.47–0.70%) among those between 16 and 55 years of age.

Figure 1 shows the lifetime incidence rate of self-reported GWs by gender and age. The highest incidence in attendees with a history of GWs was found in the age group 21–25 years (459.2, 95% CI 424.9–495.6 per 100 000 person-years). No significant differences were observed between men and women, except in two age groups: the group of subjects between 16 and 20 years of age in which more women than men reported a first episode of GWs, and the group aged 31–35 years in which the exact opposite occurred.

Risk factors were estimated for both genders independently because no significant differences in GWs prevalence were observed between men and women.

A sexual partner with GWs was identified as the strongest risk factor for the acquisition of infection (Table 2). The percentage of subjects reporting GWs in both members of the couple was 87.6% (83.2–91.3%), and the mutually adjusted OR, independent of gender, achieved 114.3 (95% CI 78.9–165.4) when compared to participants whose sexual partners had never had the infection.

The second most important predictor of GWs was the lifetime number of sexual partners; the risk of infection was found to increase with the number of partners. The highest GWs prevalence (13.2%, 95% CI 11.5–15.1%) was among subjects who had had more

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