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BRIEF REPORT

HPV vaccination coverage within 3 years of program launching (2008–2011) at Geneva State, Switzerland

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Abstract
Objective The objective of this study is to assess the HPV vaccination coverage of 11–19-year-old girls during a state-coordinated HPV vaccination program in Geneva, Switzerland, from September 2008 to June 2011.
Methods State Medical Office coordinated the HPV vaccination program. Each service provider transmitted the list of the persons who had received their first, second, or third shot.
Results The global coverage rates, 3 years after the program had been launched, were 63.72% for one dose, 63.22% for two doses, and 61.40% for three doses of the HPV vaccine.
Conclusion This study shows that it is possible to obtain a good coverage rates after 3 years of a state-coordinated HPV vaccination program.

Keywords Immunization · Adolescent · Human papilloma virus

Introduction

The human papilloma virus (HPV) is the most frequent cause of sexually transmitted infections in Switzerland (OFSP 2008a). The HPV is responsible, exclusively or not, for a large number of pathologies: cervical carcinoma in situ or invasive (100% of the cases), cancers of the anus (90%), cancers of the penis (40%), cancers of the vulva and the vagina (40%), and genital condylomas (100%). There are more than 120 genotypes of HPV. HPV 16 and 18 are directly responsible for the majority of the cervical cancers, HPV 6 and 11 for the condylomas. These viruses are widespread and the infection, which generally goes unnoticed, can be transmitted during the first sexual intercourse. Cancers may develop 15–20 years after infection (OFSP 2008a, b; WHO 2005).

Cervical cancer is a major public health problem. It affects approximately 1.4 million persons worldwide, with an annual incidence of 500,000 cases (Simoens et al. 2009; WHO 2005). Worldwide, it is responsible for 274,000 deaths per year. Cervical cancer is the second cause of cancer for women in the world just after breast cancer (Wong et al. 2011). In Europe, cervical cancer affects approximately 60,000 women and is responsible for 30,000 deaths every year (Simoens et al. 2009).

In Switzerland, every year, 5,000 young women present a precancerous lesion of the cervix or an in situ carcinoma and 320 an invasive cervical carcinoma requiring a surgical/laser treatment. Half of the women presenting a precancerous lesion of the cervix or an in situ carcinoma is less than 50 years old when the disease is diagnosed.

In Geneva, there are approximately 400 cases of in situ and 30 invasive cervix cancers every year, resulting in 5–10 deaths per year (RGT 2009).

The first vaccine to prevent cervical cancer and precancerous genital lesions caused by human papilloma virus (Gardasil®) was approved by the Swiss Drug Regulation Agency in 2006. To be completely effective, three vaccine doses are recommended within 6 months and should be administered before the beginning of sexual activity.

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The aim of this study was to assess the HPV coverage among 11–19-year-old girls (aged at the beginning of the program, in September 2008) in the Swiss canton of Geneva.

Methods

The HPV vaccination program in Geneva

The Swiss Federal Vaccination Committee recommended HPV vaccination free of charge for girls, aged 11 to 19 (OFSP 2008b), if in the context of a "state vaccination program." This free of charge for the girls stopped after their 20th birthday.

The objective of the program was to make three doses of the vaccine available as easily as possible to 11–19-year-old female residents of the state of Geneva (eligible criteria) in order to reach the highest possible coverage.

The State Medical Office coordinated the Geneva HPV vaccination program. It relied on practitioners in private practice (especially pediatricians, gynecologists, internists, and general practitioners), the School Health Service (Service Santé de la Jeunesse, SSJ) and a specially established temporary vaccination structure at the Geneva University Hospital (HUG). Vaccines were made available to the physicians through the State Medical Office.

The promotion of this vaccination program for the practitioners and the public was jointly implemented by the State Medical Office health, the Geneva University Hospital and School Health Service via two sites of information especially developed for this purpose (http://ge.ch/dares/maladies-transmissibles/vaccination_hpv-1030-3374.html and http://www.hpv-hug.ch/). A series of information brochures was realized and distributed to the healthcare professionals of the canton and in public schools. The eligible girls received directly, in their place of residence, a letter containing their three vouchers of vaccinations for the first, second, and third shots of vaccines. They could then choose their dealing doctors or the HUG vaccination structure. In these two cases, the vouchers of vaccinations were transmitted to the State Medical Office to monitor the program. A system of follow up by SMS and letter was set up to remind them of the second and third shots of vaccine.

Target population

The target population to be vaccinated was defined by the state authorities as the 11–19-year-old girls living in the canton of Geneva. At the beginning of the program in September 2008, approximately 24,000 girls were potentially eligible, with a new cohort each year of approximately 2,400 girls (data obtained from the state population registry of the Geneva State).

Epidemiological monitoring

Each service provider transmitted quarterly to the State Medical Office the anonymous list of the persons who had received their first, second, and third shots. The statistical analysis of the collected data was totally anonymous. The data were processed through the Téléform© software and analyzed to assess the HPV coverage of the target population. The data collected before June 30, 2011 was included into the study. Descriptive statistical methods with the Stata 10 software (StataCorp 2007) were used. Confidence intervals and inferential statistics were not calculated because the studied population was considered exhaustive.

Results

The global coverage rates as of June 30, 2011 for the target population (1989–1997-born cohorts, 11–19-years old on September 2008, being 14–22-years old on June 2011) were 63.72% for one dose, 63.22% for two doses and 61.4% for three doses of the HPV vaccine. These rates were quite different from one cohort to another. For example, for girls born in 1994 or 1995 (16–17-years old on 30 June 2011), cover rates were 78.5 and 80.3%, respectively for the first dose, 78.2 and 79.5% for second dose, and 78 and 79.2% for the third dose (Table 1).

The contribution to the vaccination program of the three service providers varied according to the age of the target population (Fig. 1). Service providers covered different age groups. The School Health Service (SSJ) inoculated 70% of the 16-year-old ones, 53% of the 15-year-old ones, and less than 10% of the 19–22 year-old ones. Medical doctors in private practice inoculated 50–60% of the target population except in the 15–16-year-old age group. The HUG (ad hoc vaccination center) inoculated around 50% of the older ones (age group 21–22 years) and a much lower proportion (5–15%) of the younger ones (age group 13–16 years).

The proportion of eligible girls who did not attend the second and/or third dose after receiving the first one was similar for all age groups regardless of the service providers, with the exception of the SSJ.

Discussion

Adherence is crucial for the effectiveness of a public health program. Effectiveness of an immunization program depends on high coverage and strong compliance (Rouzier and Giordanella 2010). The results of our study show that

Table 1 Percentage dose one, two, and three for vaccinated girls born between 1989 and 1997 on June 30, 2011 at Geneva, Switzerland

Birth cohorts	Age (years) on June 30 2011	Number of eligible girls (*n*)	Vaccinated girls first dose (%)	Vaccinated girls second dose (%)	Vaccinated girls third dose (%)
1989	22	2,282	42.60	41.30	40.90
1990	21	2,421	52.80	51.90	51.80
1991	20	2,342	63.50	63.00	62.60
1992	19	2,256	68.10	68.90	54.50
1993	18	2,297	75.60	75.30	74.90
1994	17	2,228	78.50	78.20	78.00
1995	16	2,307	80.30	79.50	79.20
1996	15	2,218	79.30	79.00	78.10
1997	14	2,190	65.90	65.10	64.70
Total 1989–1997 (target population)		22,693	63.72	63.22	61.40

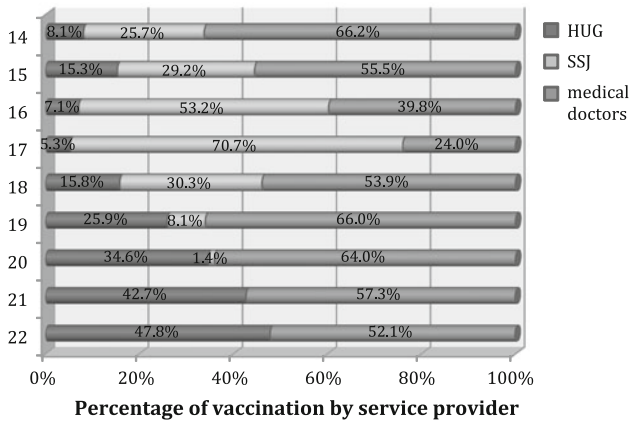

Fig. 1 Repartition of vaccination by service provider according to age (years) on June 30, 2011 at Geneva, Switzerland

the girls who were eligible at the beginning of the program have a cover rate of 63.72% for one dose, 65.10% for two doses, and 61.4% for three doses.

The lower rates of vaccination for the older cohorts (1989) might be explained by several elements: they were less targeted by HPV vaccine promotion campaigns; they had limited access to free vaccination: indeed vaccination was free of charge only up to the 20th birthday and they may not have yet a gynecologist and no longer a pediatrician.

The vaccination patterns according to the service provider show important variations that are most likely due to the implementation of the program as well as "consumer" habits: The School Health Service has inoculated a majority of seventh graders (12–13-year-old ones) because this is the main target population. The SSJ had introduced vaccination as early as the school year 2007–2008, thus technically before the official launch of the vaccination program. Medical doctors in private practice play an important role, having roughly vaccinated 50% of the target population and up to 65% in certain age groups: this might reflect the special place that practitioners have as family doctors. The HUG inoculated mostly older girls (up to roughly 50% in the 21–22-year-old group): this might reflect "an aspiration to some independence", since the HUG vaccination unit was less family-oriented than the practitioners and less school related than the SSJ.

There are published data on HPV vaccine coverage in areas where the vaccine was introduced. A study led in North Carolina among girls from 9 to 17 years shows cover rates of 39.7% for the first dose, 34.6% for the second, and 25.7% for the third (CDC 2008). Another study from the USA reports an HPV vaccine coverage of 44.2% for the first dose, 32.3% for the second, and 23.5% for the third among 13–17-year-old girls (Berry-Caban and Buenaventura 2009). An article from England reports coverage rates among 12–13-year-old girls for three doses of up to 80% (Canfell 2010). Italy reports coverage rates for girls born in 1996 and 1997: 80% for the first dose, 75% for the second, and more than 60% for the third. A recent article shows that coverage rates among 13–17 years in USA are 53% for three doses (national immunization survey) (Dorell et al. 2011).

Success of vaccination programs depends on a number of elements, including, presence of qualified health experts, availability of the vaccine, its price, the acceptability of the vaccine in the population, a clear promotion strategy, political support, etc. (Smith et al. 2011). The program initiated in Geneva by the State Medical Office has benefited from such a broad approach and gave promising results, yet the effort must be kept up. Indeed one of the key to the success of this program was the participation of the School Health Service for effective promotion of the vaccine combined with the implication of private physicians and a specially set up vaccination center. Bradin et al. have also demonstrated the importance and the

effectiveness of school-based vaccine delivery (Brabin et al. 2008). Coverage data from Australia, where the vaccine policy is also based on school delivery, are very high, which calls for advocating such a strategy (Brotherton et al. 2008). The possibility for the population to choose the vaccine inoculators (doctor, HUG, or SSJ) seems to be one of the success key of the immunization's program in the state of Geneva.

Data from Switzerland on HPV vaccination programs in the different cantons will soon be available. At the moment, this study was one of the first. A study from Vaud canton shows a coverage at 55% for the three doses for 14–20 years (Woringer 2010). The Federal Office of the Public Health is in the process of launching an inventory of the HPV vaccination programs implemented in the various cantons, addressing issues such as the adopted methodology and the obtained coverage rates: this should give an idea of the HPV vaccination coverage at the country level.

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Conflict of interest The authors declare that they have no competing interest.

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