



CLINICAL ARTICLE

Factors associated with regular cervical cancer screening

Gilles Grangé^{a,*}, Denis Malvy^b, Florian Lançon^c, Anne-Francoise Gaudin^c, Abdelkader El Hasnaoui^c

^a Hôpital Cochin-Maternité Port Royal, Paris, France

^b Hôpital Saint André-Centre Hospitalier Universitaire, Bordeaux, France

^c GlaxoSmithKline, Marly-le-Roi, France

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Abstract

Objective: To identify the factors associated with regular cervical screening (CS) in the French female population. **Methods:** Face-to-face interviews with 5354 randomly selected French women were carried out in this population-based, observational, cross-sectional study. The variables found significant by univariate analysis were entered in a stepwise analysis. A multivariate logistic model constructed with these variables permitted to identify which were significantly related to women undergoing regular CS. **Results:** A significant relationship was found between regular CS and previous screening for HIV infection, being professionally active, fear of cervical cancer, level of education, and having had a gynecologic check-up in the past 5 years. **Conclusion:** Since the study sample was known to be representative of the female adult population, most of our observations may have important public health implications in France, where information on HPV infection and its possible consequences need to be improved.

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1. Introduction

Cervical cancer is the second most common malignancy among women worldwide. It is diagnosed in almost half a million women each year and half as many die from it annually [1]. In France its incidence is estimated at 3400

cases per year [2,3]. Substantial data point to persistent human papillomavirus (HPV) infection as its cause [4–8]. The mean time between HPV infection and invasive cancer is about 15 years, and within 2 to 4 years of detection 15% to 25% of low-grade epithelial lesions become high-grade lesions. The most frequently sexually transmitted disease (STD) worldwide is HPV infection [9,10].

Still, the incidence of cervical cancer has decreased in some countries [1–3,11–13]. Mortality from this disease is related to multiple factors such as ethnicity, place of residence, income, and socio-economic status [1,14–19]. In

* Corresponding author. Maternité Port Royal, Groupe Hospitalier Cochin–Saint Vincent de Paul, Assistance Publique–Hôpitaux de Paris, Paris, France. Tel: +33 1 58 41 20 46; fax: +33 1 58 41 14 32.

E-mail address: gilles.grange@cch.ap-hop-paris.fr (G. Grangé).

most developed countries, as in France, the decline in the occurrence of cervical cancer is associated with the implementation of cervical screening (CS) programs [1,11–14,20]. In France, these essentially have consisted of cervical smear testing. Although the guidelines from the French Gynecologic Society recommend that each woman be tested every 3 years [13], CS remains irregular for too many women.

The relationship between noncompliance with screening guidelines and estimates of cervical cancer incidence has been established [21–23]. First, many studies demonstrated a relationship between the reduced incidence of cervical cancer and the implementation of CS programs [1,11–14,20–23]. In one of these studies, 35% of the 148 women with invasive cervical cancer had undergone CS only occasionally and 37% had never undergone CS. Only 17% of these women had had regular CS [22].

It is therefore reasonable to assume that regular screening would largely prevent the occurrence of cervical cancer and greatly reduce the mortality associated with it. Yet mortality rates remain high, reaching 1000 deaths per year in France [2,3]. The reasons, which seem varied, include disparity among countries in prevalent HPV types (all types not causing invasive cervical cancer) [24], health policies, and screening organization. In France, undergoing CS is not mandatory but voluntary, which explains why many women with cervical cancer have never been screened (only about 40% of the French female population undergoes regular CS according to an estimate by French insurance companies). Whether the women who die from cervical cancer in France share a particular profile should be determined if national compliance with the CS guidelines is to be improved.

The present study was conducted to identify what French women know about CS screening, HPV infection, and cervical cancer, and the relation between their level of knowledge and attitude toward CS.

2. Methods

This national, population-based, observational, cross-sectional survey was carried out between September and November 2005. Professional female interviewers from a poll agency (Institut de Sondages Laval, Issy-les-Moulineaux, France) interviewed a representative random sample of 5354 women aged 18 to 70 years living throughout France.

The source population was the entire French female population. A representative pool of possible interviewees was available from the permanent database IsoScope (IsoScope, Toulouse, France), a Microsoft Access panel (Microsoft, Redmond, WA, USA) that includes 20000 households distributed over the entire French territory. The sampling was performed following a stratified random method commonly used for nationwide epidemiological surveys in France [25]. The stratification criteria were the area of residence, age, and socio-economic level of the interviewee. The quotas were the number of interviewees per stratification. They were established according to the size of the area of residence (<2000; 2000 to 20000; 20000 to 100000; >100000; and the Paris area) and age group of the possible interviewee (18–25, 26–30, 31–35, 36–40, 41–45, 46–50, 51–55, 56–60, 61–65, and 66–70 years), plus her occupation and the occupation of the head of the family.

Data were collected on-site and face-to-face according to a computer-assisted personal interview method. The interviews

were focused on the women's own assessment of their health condition, behaviors regarding their health, health concerns, ability to express these concerns, alcohol and drug use, tobacco use, contraception methods, STD status, HIV infection status, cancer status, vaccination status, frequency of gynecologic check-ups, frequency of CS, previous histologic evaluations of cervical tissue, and knowledge regarding HPV infection.

In addition to these interviews, the participating women received printed self-administered questionnaires to be completed in private and returned to the interviewer in an unmarked envelope. These questionnaires investigated their behavior regarding tobacco, alcohol, and cannabis consumption; sexual activity; age at first intercourse; contraception; history of STD or uterine cancer; and screening experience for HIV and/or hepatitis C virus.

A comparison with national data on the female population obtained from the 1999 census was conducted to test representativeness of the study sample [26].

Only age (18–70 years) was a criterion of eligibility, and since age was verified by the interviewers, the analysis was done using the data obtained from all 5354 recruited women.

The data presented are those obtained from the study sample, but some tables and figures focus on women aged 25 to 65 years because most CS guidelines target women between these ages [2]. Moreover, sexuality was analyzed using data from the women who reported being sexually active; therefore, those who reported having no sexual activity were excluded from the analysis. SAS version 8.2 (SAS Institute, Cary, NC, USA) was used for the analysis.

A descriptive analysis was carried out first, and then a univariate analysis to identify significant variables at the 0.1 level ($P < 0.1$ by the χ^2 test). The great number of subjects in the study sample provided sufficient statistical power for this level of significance. Finally, a stepwise analysis was performed with the significant variables to construct a logistic regression model (at the 0.05 level). The variable "CS at least every 3 years" was a composite variable in both the univariate and multivariate analysis. It included a CS or a biopsy and a gynecologic check-up at least once a year or every 2 years with the last check-up during the year 2005.

3. Results

The study sample of 5354 women was known to be similar to the national population of women between the ages of 18 and 70 years in terms of sexual activity (vs no sexual activity), professional occupation, level of education, and marital status.

Of the 5354 women, 34% of those aged 18 to 25 years were living with their parents; most of the 26-year-olds were partners to the head of a family of their own; and as they aged the women tended to become head of the family themselves. The epidemiological characteristics of the population sample are presented in Tables 1 and 2. Tobacco consumption was predominant among women younger than 50 years and then declined with age. Alcohol consumption, however, increased with age (33% of the women aged between 66 and 70 years drank alcoholic beverages several times per week or every day). Cannabis consumption was predominant among the younger women (40% of those between 18 and 25 years used cannabis). The mean age at first intercourse varied with age groups. It seemed to have been

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