Papillomavirus Research 2 (2016) 78–84

Contents lists available at ScienceDirect

Papillomavirus Research

journal homepage: www.elsevier.com/locate/pvr

Ethnic background and human papillomavirus vaccine uptake in Denmark: A countrywide retrospective cohort study including 274,154 women aged 19–28 years

Victoria Fernández de Casadevante [a,b,*], Lourdes Cantarero-Arévalo [b], Julita Gil Cuesta [a,c], Palle Valentiner-Branth [a]

[a] Infectious Disease Epidemiology, Statens Serum Institut, Artillerivej 5 2300 København S, Copenhagen, Denmark
[b] Section for Social and Clinical Pharmacy, Department of Pharmacy, Section for Social and Clinical Pharmacy, Faculty of Health and Medical Sciences, University of Copenhagen, Universitetsparken 2, DK-2100 Copenhagen, Denmark
[c] European Programme for Intervention Epidemiology Training (EPIET), European Centre for disease Prevention and Control (ECDC), Tomtebodavägen 11a, S-171 83 Stockholm, Sweden

ARTICLE INFO

Article history:
Received 17 November 2015
Received in revised form
14 March 2016
Accepted 19 March 2016
Available online 14 April 2016

Keywords:
HPV
Human papillomavirus
Vaccine
Uptake
Ethnic background
Initiation

ABSTRACT

Aim: We examined ethnicity-related differences in the uptake of a temporary free-of-charge HPV vaccine (HPVV) catch-up programme offered in Denmark from August 2012 to December 2013 to women born from 1985–1992 and compared it with the previous self-payment system in place.
Methods: We conducted a nationwide retrospective cohort study. We performed logistic regression analyses to examine the relationship between ethnic background and HPV vaccine (HPVV) programme initiation.
Results: The free programme increased the vaccination uptake from 16% to 75%. Descendants (Denmark-born women with both parents of foreign origin) and immigrants in Denmark for more than 5 years were less likely to initiate the free HPVV programme than Denmark-born women ((aOR=0.56; 95% CI: 0.54–0.59) and (aOR=0.39; 95% CI: 0.38–0.40), respectively). The likelihood of HPVV programme initiation among immigrants increased with time in Denmark ((aOR=2.28; 95% CI: 2.11–2.48) for immigrants living in Denmark for 16–20 years compared to 6–10 years)).
Conclusion: The initiation of the free-of-charge HPVV programme was satisfactory. However, large differences in uptake were demonstrated, indicating that some target groups are harder to reach than others. The integration process (as related to use of health services) occurs over many years where differences between the different population groups seem to vanish.

1. Introduction

Between 2006 and 2013, two HPV vaccines (HPVV) have been licensed globally, aimed at preventing cervical cancer: Cervarix®, a bivalent vaccine that targets papillomavirus 16 and 18, and Gardasil®, which additionally targets papillomavirus 6 and 11 [1]. Additionally, a nine-valent vaccine that targets five additional papillomavirus (types 31,33,45,52,53) has been licensed by EMA in 2015 [2] and by FDA in 2014 [3]. WHO considers girls aged 9–13 years as the primary target group (routine group) to receive the HPVV [4]. Some vaccination programmes target women up to 26 years of age [5]. The highest rates of genital HPV infection are found in women from 18 to 28 years of age [6]. Targeting additionally older catch-up groups contributes to achieve higher coverage rates and to accelerating the benefits of the vaccine. Moreover, some countries experience higher HPVV coverage rates among catch-up than among routine groups [7].

Gardasil® was introduced into the Danish standard childhood vaccination programme in January 2009, aimed at girls aged 12 years. Additionally, a catch-up programme for girls aged 13–15 years had been in place lasting from October 2008 to the end of 2010 [8]. High general public support for introducing the HPVV in Denmark, in particular from organisations such as the Danish Cancer Society, resulted in the decision to also include women between the ages of 19 and 28 years in a cost-free catch-up programme lasting from 27 August 2012 to 31 December 2013 [9] (Fig. 1).

This study focuses primarily on HPVV programme initiation

* Corresponding author at: Infectious Disease Epidemiology, Statens Serum Institut, Artillerivej 5 2300 København S, Copenhagen, Denmark.
E-mail addresses: vfcm@ssi.dk (V. Fernández de Casadevante), lou.cantarero@sund.ku.dk (L. Cantarero-Arévalo), giljulita@gmail.com (J.G. Cuesta), PVB@ssi.dk (P. Valentiner-Branth).

http://dx.doi.org/10.1016/j.pvr.2016.03.003

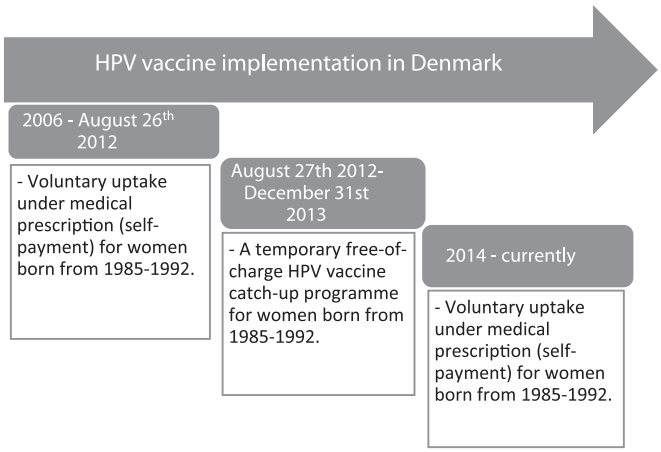

Fig. 1. Timeline for HPV vaccination programme implementation in Denmark for women born in 1985–1992.

during this cost-free catch-up programme in the cohort of women born between 1985 and 1992, and in particular on the role of ethnic background as a determinant of HPVV programme initiation. We have this particular focus as the literature suggests that ethnic background influences HPVV uptake [10–15]. In Denmark, two studies based on a cohort of girls born in 1996 [16] and 1996–1997 [17] respectively, revealed that ethnic Danish girls had a higher HPV routine vaccination uptake than Non-Danes. Since Denmark is a country with large ethnic minorities and immigrant populations, an analysis is relevant in order to determine differences in HPV vaccination by ethnic background also among older cohorts. Second, we compared this programme with the previous self-payment system in place to assess whether the free-of-charge catch-up programme had a particular effect on HPVV programme initiation in specific ethnic groups, i.e. if the introduction of a free-of-charge programme resulted in a different ethnic HPVV initiation profile when compared to initiation levels prior to the programme, when the vaccination was subject to a self-payment of approximately 1350DKK/181€ per dose. This study provides the first comprehensive analysis of ethnicity-related differences in HPV vaccination in a large cohort of women in Denmark born from 1985 to 1992.

2. Methods

2.1. Data sources

We used the Danish Vaccination Registry (DDV) to conduct a nationwide retrospective cohort study. Vaccination data and socio-demographic variables were linked through the civil registration number. All citizens residing in Denmark are registered with a unique personal identifier (CPR-number), where individual information such as name, gender, date of birth, vital status, country of birth, citizenship and address is registered.

2.2. Study period

The temporary free-of-charge HPVV catch-up programme was offered from August 27th 2012 to December 31st 2013 to all women born from 1985 to 1992 and registered as citizens in Denmark. The CPR-registry data was last updated in June 27th 2013, six months before the catch-up programme concluded. Therefore, women arriving in Denmark after this date were not included in this study.

2.3. Outcome variable

The outcome under study was the uptake of the first dose of the HPVV (HPV1) during the temporary free-of-charge catch up programme among the cohort of women born from 1985 to 1992, as well as prior to it, i.e. HPV1 uptake when the vaccine was medically prescribed and subject to self-payment.

For the purpose of this study, only HPV vaccination initiation, measured as the uptake of the first HPVV dose out of the three scheduled, was examined.

Data on HPV vaccines administered outside Denmark were not available, the result being that women who have initiated the vaccination programme outside Denmark were registered as non-vaccinated. While this is not assumed to be a major concern for most of the population under study, it is possible that there is an overrepresentation of these cases among immigrants on short-term stays in Denmark (e.g. students), particularly if they have a similar level of access to the vaccine in their home countries. Therefore, women living in Denmark for less than 6 years from the end of the free-of-charge vaccination programme were removed from the logistic regression models, assuming that the number of women in this age group vaccinated against HPV by December 31st 2007 in their countries of origin is low.

2.4. Predictor variables

The variables under study were all socio-demographic variables registered in the CPR-registry that either provide a measure of ethnicity or are shown to be related to the uptake of the HPVV [10,16,18–24].

2.4.1. Main predictor variable

- Ethnic background, categorised into four groups according to women' and parents' country of origin: Denmark-born women with both parents Denmark-born, Denmark-born women with one parent Denmark-born, Denmark-born women with both parents of foreign origin (descendants) and women of foreign origin (immigrants). For descendants, further divisions were made by grouping women according to parents' region/country of origin. Immigrants were also further categorized according to their region/country of origin.

Countries with a representative population of 800 women or more were categorized independently, and countries with smaller populations were grouped together according to region of origin.

2.4.2. Other predictor variables (control variables)

- Year of birth: women were categorized in eight groups by year of birth, from 1985 to 1992.
- Civil status: Women were divided into two categories: Married, which includes married women and women in a registered partnership, and not married, which accounts for single, divorced, widows and women whose registered partnership finished.

- Area of residence: based on their address, the women were grouped in eleven specific areas of residence in Denmark.
- Years lived in Denmark: The years spent in Denmark were grouped in periods of five years, except from the last category in which 8 years were grouped together (6–10 years, 11–15 years, 16–20, 21–28 years).