Vaccine 32 (2014) 4399–4403

Contents lists available at ScienceDirect

Vaccine

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

Achieving high uptake of human papillomavirus vaccine in Cameroon: Lessons learned in overcoming challenges

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ARTICLE INFO

Article history:
Received 7 April 2014
Received in revised form 5 June 2014
Accepted 12 June 2014
Available online 24 June 2014

Keywords:
Human papillomavirus
Cervical cancer
Vaccine
Cameroon

ABSTRACT

Background: Cameroon has the highest age-standardized incidence rate of cervical cancer (30/100,000 women) in Central Africa. In 2010–2011, the Cameroon Baptist Convention Health Services (CBCHS) received donated human papillomavirus (HPV) vaccine, Gardasil, from Merck & Co. Inc. through Axios Healthcare Development to immunize 6400 girls aged 9–13 years. The aim was to inform the Cameroon Ministry of Health (MOH) of the acceptability, feasibility, and optimal delivery strategies for HPV vaccine.
Methods and findings: Following approval by the MOH, CBCHS nurses educated girls, parents, and communities about HPV, cervical cancer, and HPV vaccine through multimedia coverage, brochures, posters, and presentations. Because educators were initially reluctant to allow immunization in schools, due to fear of adverse events, the nurses performed 40.7% of vaccinations in the clinics, 34.5% in community venues, and only 24.7% in schools. When no adverse events were reported, more schools and communities permitted HPV vaccine immunization on their premises. To recover administrative costs, CBCHS charged a fee of US$8 per 3-dose series only to those who were able to pay. Despite the fee, 84.6% of the 6,851 girls who received the first dose received all three doses.
Conclusions and lessons learned: With adequate education of all stakeholders, HPV vaccination is acceptable and feasible in Cameroon. Following this demonstration project, in 2014 the Global Access to Vaccines and Immunization (GAVI) Alliance awarded the Cameroon MOH HPV vaccine at a price of US$4.50 per dose to immunize sixth grade girls and girls aged 10 years who are not in school in two districts of Cameroon.

1. Introduction

Cervical cancer is the leading cause of cancer mortality among women in Africa [1]. In Cameroon, cervical cancer accounts for 23% of all cancers among women, with an annual incidence of 1993 cases (age-standardized rate 30/100,000 women) and 1129 deaths per year (age-standardized rate 17.5/100,000 women) [1]. While developed countries have significantly reduced cervical cancer through screening, early treatment and use of prophylactic vaccines, similar initiatives are lacking in Africa [2].

Multiple initiatives are being explored to reduce the burden of cervical cancer in Africa [3]. Notably, the Global Access to Vaccines and Immunization (GAVI) Alliance has recently announced its plans to prepare eligible low-income countries for nationwide rollouts of HPV vaccine at a reduced price of US$4.50 per dose [4]. The first GAVI Alliance HPV vaccine demonstration project was launched in Kenya in 2013 and 18 additional African countries including Cameroon were approved to receive similar support in 2013 and 2014 [5].

Additionally, five African countries have implemented their own initiatives to reduce cervical cancer prevalence. Rwanda became the first country in Africa to carry out a national HPV vaccination program through its partnership with Merck & Co. Inc. (the manufacturer of the HPV vaccine, Gardasil), achieving 93% coverage for all the three doses of HPV vaccination of all grade six adolescent girls in 2011 [6]. Similar HPV vaccination projects were recently

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http://dx.doi.org/10.1016/j.vaccine.2014.06.064
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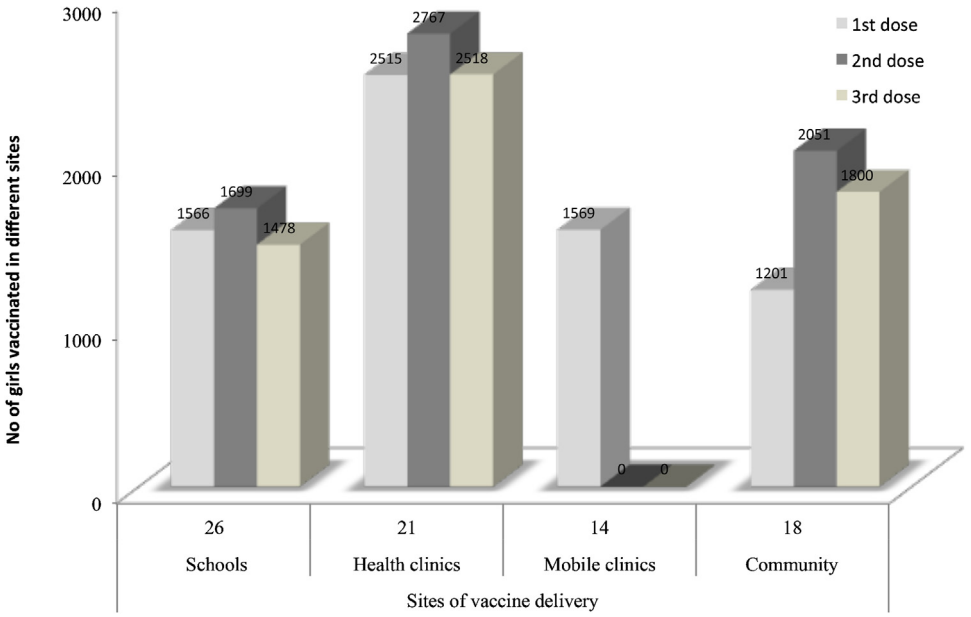

Fig. 1. Human papillomavirus vaccine demonstration project in Cameroon 2010–2012. * The column for mobile clinics is blank for second and third doses because most of the girls that were enrolled during mobile clinics were later traced and vaccinated in the communities.

undertaken in Uganda [7], Tanzania [8], Lesotho [9] and South Africa [10]. These countries delivered HPV vaccines for free to the targeted populations. All the countries used a school-based delivery model, with the exception of Lesotho, which used a mixed approach (schools and health facilities).

With limited access to screening and treatment particularly in Africa, it is more important to vaccinate girls against HPV to offer protection against cervical cancer. With a subsidy from GAVI, HPV vaccination will now be cost-effective compared to routine cervical cancer and HPV DNA screenings [11]. However, a recent systematic review assessing readiness of HPV vaccine introduction in sub-Saharan Africa found most countries are not prepared, demonstrating a need for HPV vaccine demonstration projects [3].

In recognition of the disproportionately high incidence of cervical cancer, Cameroon Baptist Convention Health Services (CBCHS) successfully applied to Axios International's Gardasil Access Program in 2009, for 19,200 doses of donated vaccine to immunize 6400 girls aged 9–13 years. From March 2010 through November 2012, CBCHS conducted a HPV vaccine demonstration project with donated vaccine in three settings: schools, healthcare facilities, and via community outreach. This paper reports the success of the CBCHS HPV vaccination initiative, identifying lessons learned in overcoming the challenges.

2. Materials and methods

2.1. Settings and vaccine procurement

CBCHS has provided medical services to Cameroonians for over 60 years (see www.cbchealthservices.org). It currently runs six hospitals, 26 integrated health centers, and over 50 primary health centers in six of Cameroon's ten regions. CBCHS's Women's Health Program (WHP) provides cervical cancer screening and treatment of precancerous lesions and other services at six CBCHS facilities as well as a mobile clinic that serves remote rural communities. CBCHS followed World Health Organization guidelines with regard to target age group and dosing [12]. Immunization took place in the capital city Yaoundé, North West (NW) and South West (SW) Regions of the country. The vaccination and procurement timeline is provided in Supplementary Fig. S1. The facilities that coordinated the immunizations are noted in Supplementary Fig. S2.

2.2. HPV vaccine implementation strategy

In order to achieve an 85% three-dose completion rate, CBCHS nurses first carried out awareness campaigns, making presentations in English, French, Pidgin and sometimes the local tribal language in schools, churches, clinic waiting rooms, and community gatherings. The presentations were geared to educate adolescents, parents, health care workers, and community leaders about HPV vaccine and cervical cancer as reported elsewhere [13–15]. WHP nurses also designed posters that were hung in multiple clinics and other venues and brochures were handed out to adolescents in schools and to other stakeholders. These campaigns resulted in high awareness among parents and adolescent girls in the different communities where vaccine intervention was implemented [13,14]. Since many teachers and school principals were initially reluctant to allow vaccination in schools because they were concerned about adverse events, it was necessary to explore other vaccine delivery strategies.

The three approaches used to deliver vaccines to girls were clinics, schools, and community. Community venues included churches, homes and a mobile clinic in a donated US Army ambulance for the mother-daughter approach (simultaneously screening mothers for cervical cancer while immunizing their daughters). All the clinics (Table S1), schools, and communities were chosen based on convenience and consent from relevant authorities.

Following approval from MOH and CBCHS institutional review committees to vaccinate, the vaccine was first administered in clinics to assure parents there was medical back up available should any side effects occur, as this was a major concern during the sensitization [14]. When no significant adverse events were reported among the first 1600 girls immunized in clinics, CBCHS nurses began to administer the first doses of vaccine in schools near the clinics, if the principal approved. The girls were either handed information sheets and consent forms to take home to their parents or given letters of invitation for parent–teacher association meetings during