What Caused the Decrease of Human Papillomavirus Vaccination in Korea?: Research on 61 Physicians’ and Parents’ Awareness towards HPV Vaccination

Youn Jin Choi¹, Sae-Young Lee², Yong Seok Lee³, Won-Chul Lee⁴, Jennifer S. Smith¹, Jong Sup Park¹ and Chan Joo Kim*¹

¹Department of Obstetrics and Gynecology, College of Medicine, the Catholic University of Korea, Seoul, Republic of Korea
²Department of Preventive Medicine, College of Medicine, the Catholic University of Korea, Seoul, Republic of Korea
³Department of Epidemiology, Gillings School of Global Public Health, University of North Carolina, Chapel Hill, North Carolina, United States of America

Objective: Human Papillomavirus (HPV) vaccine reduces the risk of cervical cancer. However, the number of Korean daughters who were injected with HPV vaccine markedly decreased after the report of adverse events following HPV vaccination. Therefore, we aimed to analyze physicians’ and parents’ perspectives towards HPV vaccination.

Methods: We conducted in-depth interviews with 30 physicians and focus group discussions with the 31 mothers of vaccinated and unvaccinated daughters.

Results: Most of the physicians were equipped with fundamental knowledge of HPV vaccination and most of the mothers were informed of HPV vaccination. Seven of the 30 physicians and a majority of mothers of unvaccinated daughters concerned about the side effect of HPV vaccine. Answer for the question, “How often do you recommend HPV vaccination to parents of girls in your practice?” show that 10 of 30 physicians (33%) recommended the vaccine as always and most of the times. Most of the participants were interested in two-dose vaccination as an alternative to the three-dose vaccination.

Conclusion: We found that mothers’ awareness of adverse events and lack of physicians’ explanation and recommendation of the HPV vaccine may have caused the decrease of HPV vaccination after the adverse medical report. Our findings may provide a useful resource to increase the HPV vaccinated population; hence the incidence of cervical cancer may decrease.

Keywords: Cervical cancer, Human papillomavirus, HPV vaccine, Three-dose HPV vaccination, Two-dose HPV vaccination

Introduction

Worldwide, cervical cancer is the third most common cancer among women [1]. More than 3,000 Korean women are newly diagnosed and more than 1,000 succumb to the disease each year [2]. High risk of human papillomavirus (HPV) genotypes can cause cervical cancer and HPV vaccination is known to reduce the incidence and related deaths [3]. In 2006 and 2007, the Korean Food and Drug Administration approved bi-valent and quadri-valent HPV vaccines (Gardasil® and Cervarix®). Since then, the number of Korean women who received the HPV vaccine was increasing, contributing to the decrease incidence of cervical pre-malignancy and malignancy [4]. However, the incidence rate abruptly decreased (~43%) in 2013 [5] (unpublished data; email from MSD Korea Ltd.) after the Japanese Ministry of Health, Labour and Welfare (MHLW) partially suspended the HPV vaccination program due to reports of adverse events [6,7].

No study has solely evaluated the knowledge and perspectives of HPV vaccination among the Korean physicians and mothers of daughters, after the report of adverse events following HPV vaccination. Therefore, we aimed to analyze their perspectives towards HPV vaccination.

This paper is a component of a regional report entitled “Multi-site HPV Vaccine Acceptability Study” by Jennifer S. Smith from UNC Gillings School of Global Public Health, USA.

Materials and Methods

Study design and participants

The study was approved by the International Review Board (IRB) of the Catholic
University of Korea, Seoul, Korea. From November 2013 to January 2014, the study was conducted by Nielson Korea, a leading and experienced research organization that is affiliated with Nielson International.

Thirty physicians were recruited for the study, who were authorized to administer adolescent vaccines (Table 1). The Nielson International database and Health Insurance Review & the Assessment Service in Korea (www.hira.or.kr) database confirmed the preliminary information of the candidates, then the physician interviews were pursued.

Focus group discussions were divided into two groups; mothers of daughters (ages range from 11 to 14) who (i) had been vaccinated and (ii) had not been vaccinated. We set four focus groups (FG1, FG2, FG3 and FG4) with 31 mothers and each group contained seven to eight mothers (M1, M2, M3, M4, M5, M6, M7 and M8) (Table 2). The group discussions were tape-recorded, transcribed and translated into English.

All the participants received gift cards as compensation for their time and travel to the focus group discussion site but did not receive any other incentives.

Data collection and analysis

Semi-qualitative data and quantitative data collected from the physicians included interview notes. Transcriptions, observation notes and debriefing session notes were analyzed for content and themes. Using study objectives, the data was systematically analyzed.

Results

Participant characteristics

The characteristics of the physicians are described in Table 1. Thirty participants were included; 12 (40%) were gynecologists, six (20%) were family practitioners, general practitioners, or internists and 12 (40%) were pediatricians. Of 31 mothers, 23 (74%) had daughters who were not vaccinated (three focus groups; FG1, FG2 and FG4) and eight (26%) had those who were vaccinated (one focus group; FG3) (Table 2). The majority of both groups were unemployed (unvaccinated: 65%; vaccinated: 88%).

Knowledge upon HPV and HPV vaccination

Previous study observed that knowledge determined the participants’ perspectives upon the vaccination [8], therefore we first analyzed the participants’ knowledge upon HPV vaccination. We found that all the physicians had fundamental knowledge upon HPV vaccination (Table 3). They all knew that three-dose schedule HPV vaccine was recommended and only females were recommended to be vaccinated in Korea. However, some knowledge regarding vaccination was not consistent among the physicians. In Korea, HPV vaccine is included in a national immunization program (NIP) [9], but five physicians (16.7%) did not know the vaccine was included in the NIP.

The majority answered they had informed of HPV and the vaccine. However, the range of knowledge varied from “I have heard only the name of HPV (M1 in FG2)” to “I know HPV causes cervical cancer (M3 in FG4)”. All the mothers of vaccinated daughters (FG3) had more in-depth knowledge about HPV and HPV vaccine than the mothers of unvaccinated daughters. Their answers included: “I heard that the pharmaceutical company had a clinical study regarding different dose schedules of the vaccine.” (M8 in FG3) and “I heard that the vaccine does not fully prevent cervical cancer because it does not cover all the HPV types.” (M2 in FG3).

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Table 1: Characteristics of 30 physicians.

<table>
<thead>
<tr>
<th>Primary care specialty</th>
<th>Gyneceology</th>
<th>Pediatrics</th>
<th>Family Medicine, General Practice or Internal Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>12 (40%)</td>
<td>12 (40%)</td>
<td>6 (20%)</td>
</tr>
<tr>
<td>Male</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Female</td>
<td>6</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Mean period of practice as a clinician (± SD) (years)</td>
<td>13.4 (±3.2)</td>
<td>14.7 (±4.5)</td>
<td>13.2 (±7.3)</td>
</tr>
<tr>
<td>Experience with administering HPV vaccine to daughters (9-14 years)</td>
<td>Yes: 7</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>No: 5</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 2: Socioeconomic characteristics of 31 mothers

<table>
<thead>
<tr>
<th>Mothers of unvaccinated daughters</th>
<th>Mothers of vaccinated daughters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>23</td>
</tr>
<tr>
<td>Mean age (years) (± SD)</td>
<td>41 (±3)</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>15 (65%)</td>
</tr>
<tr>
<td>Employed</td>
<td>8 (35%)</td>
</tr>
<tr>
<td>Monthly income a)</td>
<td></td>
</tr>
<tr>
<td>Low (&lt; $3,000 [US dollars])</td>
<td>8 (35%)</td>
</tr>
<tr>
<td>Middle ($3,000 to $4,800)</td>
<td>4 (17%)</td>
</tr>
<tr>
<td>High (&gt; $4,800)</td>
<td>11 (48%)</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
</tr>
<tr>
<td>Christian/ Catholic</td>
<td>11 (48%)</td>
</tr>
<tr>
<td>Buddhist</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Atheist</td>
<td>11 (48%)</td>
</tr>
<tr>
<td>Focus Group (FG)</td>
<td>BG1, BG2, BG4</td>
</tr>
</tbody>
</table>

a) 1 US Dollar=1,000 Korean Won
Awareness towards HPV vaccination

A small number of physicians had safety concerns; seven of the 31 physicians answered that they were aware of side effect of the vaccine (Table 3). It is notable that none of the gynecologists (12 of 30 physicians) considered that the side effect of HPV vaccine. Answer for the question, “How often do you recommend HPV vaccination to parents of girls in your practice?” was like this. Only 10 of 30 physicians (33%) recommended the vaccine as always and most of the times. While, 23 of them (77%) said that the disadvantage the vaccine was ‘high cost’ (Table 3).”

A majority (23/31) of the mothers of unvaccinated daughters considered the adverse events following HPV vaccination as a barrier factor but the ones of vaccinated daughters did not. Of the mothers of the unvaccinated daughters, some were informed of adverse events of HPV vaccination from mass media (M4 in FG4, M7 in FG4) and therefore they considered that the side effect of HPV vaccine was not reliable (M2 in FG2). A mother said “The news showed a girl who could not walk because of paralysis caused by the vaccine. It was very shocking” (M4, FG4). Another responded, “I was about to vaccinate my daughter, but the Korean media reported that side-effects occurred in Japan, so I didn’t” (M7, FG4). However, mothers of vaccinated daughters answered that they did not consider the adverse effects as a major problem, since all the medication may carry adverse events. (M1 and M2 in FG3).

Three-dose vs. two-dose vaccination

The participants were asked about one dose reduction of HPV vaccine (the alternative two-dose HPV vaccine) as a solution to decrease the adverse effects. The current vaccine is given to girls in three doses, timed at 0, 1 and 6 months but alternative vaccine is given in two doses at 0 and 6 months. Majority of the physicians were positive with alternative two-dose vaccination; 27 of the 30 physicians answered that the two-dose vaccine would act as a facilitator for HPV vaccination safety were guaranteed. Many of the mothers welcomed and preferred the two-dose vaccine in terms of convenience but not in terms of safety. They concerned two-dose vaccination might increase the adverse events.

Discussion

This is the first study addressing knowledge and perspectives of Korean physicians and mothers towards HPV vaccination after the Japanese MHLW partially suspended the HPV vaccination program due to the report of adverse events [6]. This study found that Korean physicians and mothers have a high degree of interest and knowledge regarding the HPV vaccine, albeit with different ranges. We found that the mothers of unvaccinated daughters have concerns upon the adverse events of HPV vaccination. But the mothers of vaccinated daughters had more affirmative perspectives towards the vaccination. They said that all the medication may carry adverse events. In addition, our data showed that many of the participants were interested in the alternative two-dose vaccination program.

Our findings presented that Korean physicians and mothers had high interest and fundamental knowledge of HPV vaccination. These findings oppose to the previous studies [10,11] that reported Korean mothers had low awareness of HPV vaccination and cervical cancer. The authors believe that that the knowledge regarding vaccination may have increased, because a decade has passed since the launch of the HPV vaccine in the market.
and reports of series of suspected adverse events related to the vaccine attracted public attention.

The key words that describe Korean physicians’ and mothers’ perspectives towards HPV vaccination are “high cost” and “adverse events” (Table 3). Of 30 physicians, 23 considered the vaccine was with high cost, while having only seven them concerned of the adverse effects. The data indicates that the Korean physicians were less influenced by the recent medical report of the adverse effect following HPV vaccination than the physicians in Japan [12]. However, a majority of Korean mothers of unvaccinated daughters were much influenced by the report. Slade et al. reported that there was no common pattern of reported adverse events that would suggest that they were caused by the HPV vaccine [13]. The World Health Organization (WHO) Global Advisory Committee on Vaccine Safety (GACVS) reported that there was no causal link between HPV vaccination and the development of an autoimmune disease [3].

In order to have daughters benefit from HPV vaccination, physicians’ explanation and recommendation of the vaccine is imperative [11,14,15]. Our results showed that only 33% of the physicians (10 of 30 physicians) (Table 3) recommend the vaccine more than ‘most of the times’. Our findings indicate that it is necessary to educate the physicians to inform the population of the benefits of the vaccine and recommend it.

Present study showed the alternative two-dose HPV vaccination would be well-received by both physicians and mothers, if its safety were guaranteed. In recent studies, the two-dose vaccination was compared to the three-dose vaccination and it was reported to be effective [16-18]. The safety of two-dose vaccination was observed in phase three trial [16]. Moreover, European Medicines Agency approved the two-dose schedule of HPV vaccine (both bi-valent and quadri-valent) [19,20].

A limitation of our study was that it comprised a relatively small number of participants and that the majority of the mothers are unemployed. However, we used the systematic inclusion methods for selecting the mothers; the proportion of “vaccinated” and “unvaccinated” daughters, family’s monthly income and residential areas corresponded to the general Korean population. Moreover, the composition of the physicians was determined according to the Health Insurance Review and Assessment Service in Korea (www.hira.or.kr) database.

Our data may explain the factor that caused an abrupt decrease of HPV vaccination in Korea after the report of adverse events. In summary, we found that two main factors might have produced for the decrease the number of HPV vaccinated population; (i) mothers’ awareness of adverse events is following HPV vaccination and (ii) lack of physicians’ explanation and recommendation of the HPV vaccine. In addition, the pre-existing barrier “high cost” of the vaccine also contributed to the decrease. Our data showed that many of the physicians and parents were interested in two-dose vaccination as an alternative to the conventional three-dose vaccination, if safety were guaranteed. Together, present study may provide a useful resource to increase the HPV vaccinated population; hence the incidence of cervical cancer may decrease.

Acknowledgement

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References


2. ICO HPV Information Centre: Korea, Republic of Huma Papillomavirus and Related Cancers, Fact Sheet 2013. 2014.


5. 2014 IMS 1 Quarter Human Papillomavirus Vaccine market data. 2014.


