Vaccine 31 (2013) 4675–4681

Contents lists available at SciVerse ScienceDirect

Vaccine

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

Acceptability of HPV vaccines and perceptions related to genital warts and penile/anal cancers among men who have sex with men in Hong Kong

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ARTICLE INFO

Article history:
Received 15 August 2012
Received in revised form 21 January 2013
Accepted 25 June 2013
Available online 8 July 2013

Keywords:
Men who have sex with men
HPV vaccines
Acceptability
Genital warts
Penile/anal cancers
Perceptions

ABSTRACT

Men who have sex with men (MSM) are at high risk of contracting HIV and developing genital warts and penile/anal cancers. HPV vaccines are efficacious in preventing such HPV-related diseases among males and WHO recommends its use to young MSM. In a cross-sectional survey, 542 MSM were interviewed. After being briefed about the vaccines' efficacies and the market price, the prevalence of acceptability of HPV vaccination was 29.2%. Adjusted by significant background variables, perceived high/very high chances of contracting genital warts [adjusted odds ratio (AOR) = 2.04, 95%CI = 1.11–3.72] and penile/anal cancers (AOR = 1.89, 95%CI = 1.09–3.29) among local MSM, perceived moderately high mortality rate of penile/anal cancers (AOR = 1.78, 95%CI = 1.13–2.81), fear toward penile/anal cancers (moderate: AOR = 1.75, 95%CI = 1.07–2.86; high/very high: AOR = 1.82, 95%CI = 1.13–2.92) and disagreement with the statement "MSM in general are not willing to take HPV vaccines" (AOR = 1.82, 95%CI = 1.24–2.68) were associated with the conditional acceptability. Acceptability of this new measure is reasonably high and there are rooms for improvement. Implementation trials to promote HPV vaccination by changing cognitions such as HPV-related risk perceptions, norms and perceptions toward anal/penile cancer are greatly warranted.

1. Introduction

HPV infection is prevalent among people who are sexual active, causing genital warts, cervical, oropharyngeal, penile and anal cancers [1]. High-risk HPV infections (types 16, 18) account for over 90% of the anal intraepithelial neoplasis cases (AIN) and 84.3% of the anal cancer cases [2]. Anal intercourse and history of HPV-related genital warts are both risk factors of anal cancer [3]. The incidence of anal cancer is 20 times higher among MSM than among heterosexual men and it has been increasing in the last two to three decades [2]. A recently published meta-analysis reported high incidence of histological high-grade AIN (6.0/100 person year) and anal cancer (5.1 per 100,000 person year) among HIV negative MSM [4] and the incidences were even two to three folds higher among HIV positive MSM [4]. In China, high prevalence of HPV (61.2–71.2%) [5–7] and genital warts (2.5–13.2%) [8,9] have been reported among men who have sex with men (MSM). Though no study has reported prevalence and incidences of penile/anal cancers among MSM in China, one study showed that 37.9% of the HIV positive MSM in China had abnormal anal cytology, which was significantly associated with HPV infection [10].

Recently, a number of clinical trials showed that the efficacies of HPV vaccines were 88.1% for prevention of HPV-related genital warts (types 6, 11, 16 and 18) and 74.9% for prevention of AIN (grades 2 and 3) among men [11]. The U.S. Center for Diseases Control and Prevention recommends MSM of age 21–26 years old to take up HPV vaccines [12]. A meta-analysis review reported a high prevalence (5.3% in 2007–2009) [13] and a high incidence (3.5 per 100 person-year) of HIV [14] among MSM in China. Since genital warts is a known cofactor predicting HIV sero-conversion [15], the high and increasing prevalence of HIV among MSM in China may motivate them to take up HPV vaccines [2]. As cancer prevention is one of the major reasons for females to take up HPV vaccines [16,17], the elevated risk of penile/anal cancers among MSM may be a motivator.

Acceptability studies inform design and implementation of vaccination campaigns. Six HPV vaccine acceptability studies have

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http://dx.doi.org/10.1016/j.vaccine.2013.06.090

been conducted among MSM, reporting prevalence of acceptability ranging from 36% to 86% [18–23] and associated factors such as recommendation from doctors [20], number of lifetime sex partners [20], perceived severity of HPV-related diseases [20], perceived benefits resulted from vaccination [22], perceived effectiveness of the HPV vaccines [20,22] and potential anticipated regret of developing HPV infection in the future [20]. No study has investigated associated factors such as perceived susceptibility, perceived severity and fear that were specific to genital warts and anal/penile cancers. Important constructs such as perceived severity, perceived susceptibility and subjective norms, which were used in our study to guide variables selection, are parts of the commonly used Health Belief Model (HBM) [24] and the Theory of Planned Behaviors (TPB) [25]. Fear toward genital warts and fear toward anal/penile cancers may also be associated with acceptability of HPV vaccination. Fear appeal theories have been widely used in health promotion though its effectiveness was mixed [26]. It is known that theory-based interventions are more likely than non-theory based ones to be effective [27].

This study investigated the intention to take up HPV vaccines in the next six months among MSM in Hong Kong, conditioned on specific efficacies for preventing genital warts (>90%) and HPV-induced cancers (75%) [11] and a market price of HK$1000–2000 (US$ 128–256) per shot for three shots. Perceptions related to genital warts and penile/anal cancers were assessed. Associations between such perceptions and conditional acceptability were investigated.

2. Materials and methods

2.1. Study population and data collection

Inclusion criteria were: (1) Hong Kong Chinese men of 18–60 years old and (2) having had oral or anal intercourse with at least one man in the last six months. Participants were recruited from some gay venues (bars and saunas) frequently visited by gay people during September 2010 through January 2011. The research team approached 12 gay bars and 16 gay saunas in Hong Kong that had been identified in a recent mapping exercise. The venue-based interviews were conducted by some experienced peer MSM interviewers at different time slots during weekdays and weekends. They briefed prospective participants about the study and invited them to join the study. Convenience sampling was performed at the venues. With written informed consent, 542 participants completed the anonymous face-to-face interview in a private setting and were given HK$50 (about US$ 6) for their time spent. Ethics approval was obtained from the ethics committee of the Chinese University of Hong Kong.

2.2. Measures

Data on socio-demographic information, sexual orientation, unprotected anal intercourse (UAI) with different types of male sex partner(s) and multiple sex partnerships in the last six months were collected (see Table 1). Commercial sex partners (CSP) were defined as those who exchanged sex with money; non-regular sex partners (NRP) were defined as those who were neither regular sex partners (RP: boyfriends or lovers) nor CSP. Participants were asked about their willingness to take up HPV vaccines in the next six months after reading the following statement to them: "Scientific evidences have shown that the efficacies of HPV vaccines are >90% for preventing genital warts and 75% for preventing HPV-induced penile and anal cancers. Three shots need to be taken within six months and the market price is between HK$1000–2000 (US$ 128–256) per shot. Variables on perceptions related to genital warts and penile/anal cancers were derived from two of the HBM constructs (four items on perceived susceptibility and eight items on perceived severity) and one construct of the TPB (three items on subjective norm). In addition, two questions assessed the levels of fear toward genital warts and penile/anal cancers. The items are listed in Table 2.

Table 1
Frequency distributions of the background variables ($N = 542$).

	N	%
Background characteristics		
Age group		
18–30	289	53.3
31–40	195	36.0
41–60	58	10.7
Highest education attained		
Senior high or lower	198	36.6
College or above	344	63.5
Marital status		
Single/divorced or widowed	461	85.1
Cohabiting with a man	69	12.7
Cohabiting or married with a woman	12	2.2
Self-identified sex orientation		
Homosexual	470	86.7
Bisexual/heterosexual/uncertain	72	13.3
Sexual behaviors in the last six months		
Multiple male sex partnerships		
No	299	55.2
Yes	243	44.8
UAI with regular male partner(s)		
No or no such partner	419	77.3
Yes	123	22.7
UAI with non-regular partner(s)		
No or no such partner	463	85.4
Yes	79	14.6
UAI with commercial male partner(s)		
No or no such partner	535	98.7
Yes	7	1.3

2.3. Statistical analysis

The dependent variable was acceptability of HPV vaccines conditional on the mentioned efficacies and market rate. Adjusting for those variables selected by a multivariate forward stepwise logistic regression model with background factors with $p < 0.1$ in the univaraite analysis as candidates, adjusted odds ratios (AORs) and respective 95% confidence intervals were derived. Using all variables with $p < 0.10$ obtained from the univariate analysis as candidates, a summary forward stepwise logistic regression model was fit (entry criteria $p = 0.10$, removal criteria = 0.20). Data analyses were performed using SPSS 16.0 (SPSS Inc., Chicago, IL) and $p < 0.05$ was considered statistically significant.

3. Results

3.1. Background characteristics

Of the participants, 53.3% were 30 years old or younger; 63.5% had attained colleges; 12.7% were cohabitating with a man; 86.7% considered himself homosexual. Respectively, 22.7%, 14.6% and 1.3% of all the participants had UAI with at least one regular male sex partner, at least one non-regular male sex partner and at least one commercial male sex partner in the last six months, whilst 44.8% of all the participants had multiple male sex partners in the last six months (Table 1).

3.2. Acceptability and perceptions

A total of 29.2% of the participants expressed acceptability (definitely or very likely) of HPV vaccination (willingness to take up HPV vaccines in the next six months conditioned on the mentioned efficacies and market price). Respectively, 28.4% and 17.3% of the