Forster, AS; Marlow, LAV; Waller, J; (2010) Adolescents' beliefs about their parents' human papillomavirus vaccination decisions. BJOG: An International Journal of Obstetrics & Gynaecology , 117 (2) 229 -233.

ARTICLE

Adolescents' beliefs about their parents' human papillomavirus vaccination decisions

Alice S Forster, Laura AV Marlow, Jo Waller

Cancer Research UK Health Behaviour Research Centre, University College London

Corresponding author: Dr Jo Waller, Cancer Research UK Health Behaviour Research Centre, Department of Epidemiology and Public Health, UCL, Gower Street, London, WC1E 6BT, UK, tel: +44 (0)20 7679 5958, fax: +44 (0)20 7679 8354, email: j.waller@ucl.ac.uk

Alice S Forster: +44 (0)20 7679 1723, a.forster@ucl.ac.uk
Laura AV Marlow: +44 (0)20 7679 1798, l.marlow@ucl.ac.uk

Abstract
A significant minority of parents are concerned that human papillomavirus vaccination will affect sexual behaviour. We explored this issue with 162 adolescent girls. Most (between 90 and 92%) did not perceive a connection between parental consent to vaccination and parental authorisation for sexual activity but a small percentage believed vaccination consent implied they were old enough to have sex (8%), or that it was okay for them to be sexually active (10%). The findings are broadly reassuring but highlight the need for vaccination information materials to clarify why the vaccine is administered before sexual debut.

Keywords: Sexual behaviour

Introduction

Oncogenic strains of human papillomavirus (HPV) cause 99% of cervical cancers [1] and are usually sexually transmitted. Prophylactic vaccines have been developed to protect against the two most common oncogenic HPV types (16 and 18) which cause around 70% of cervical cancers [2]. The vaccines are believed to be close to 100% effective at preventing infection with these HPV types if given to individuals who are naïve to infection (this is normally equivalent to not having had sexual contact) [2]. In the UK, 12-13 year old girls are now offered a course of the three-dose HPV vaccine as part of the childhood immunisation programme, and adolescents up to age 18 will be offered vaccination as part of a one-off 'catch-up' programme.

There is evidence that a significant proportion of parents are concerned about the safety and efficacy of the vaccine and these concerns seem to be associated with weaker intentions to vaccinate [3]. An additional concern among parents is that the vaccine may encourage risky sexual behaviour. It has been suggested that adolescents will think that by allowing them to have the vaccine, their parents are implicitly giving '*carte blanche'* approval for sexual activity, and this might encourage an earlier sexual debut [4]. A mother in a qualitative study conducted by Bair et al. [4] summarised this succinctly: *"We are giving them permission to have sex"*. Although implicit approval

does not necessarily mean that adolescents will engage in risky sexual behaviour, mothers have reported reservations about the HPV vaccine for this reason [3].

There is a growing body of literature on parental attitudes to the HPV vaccine; although as the immunisation programme has only recently been introduced, most studies assess beliefs hypothetically. There are fewer studies assessing adolescent attitudes and none that have asked girls about the meaning they take from their parents' agreement to or denial of the vaccine. Research has not examined the validity of parents' concerns about vaccination or more subtly, parental approval for vaccination providing *'carte blanche'* approval for sexual activity. The present study explored whether adolescents intend to have HPV vaccination, their beliefs about whether their parents would consent to vaccination, and their interpretation of the meaning of their parents' decision.

Methods

Female adolescents in UK school year 10 (age 14-15) were recruited from a high-achieving, state-funded, single-sex secondary school in London. This age group was chosen as they will be involved in the HPV vaccination 'catch-up' programme and the school was chosen

Page 230 - - >

opportunistically. During a school lesson the adolescents read a leaflet that provided information about HPV, cervical cancer, the HPV vaccine, and cervical screening. The leaflet was developed following a series of interviews and focus groups. Participants were given as much time as they needed to read the leaflet and then completed a questionnaire anonymously. There was no incentive to complete the questionnaire.

The questionnaire assessed demographic characteristics (age, ethnicity, religion, and whether they were practising that religion), vaccination intentions and perceptions of parents' beliefs about sexual behaviour and vaccination. Parental beliefs about HPV vaccination have been elicited in previous research [3;5]. The items were generated using this previous work and were piloted with a small opportunistic sample to minimise ambiguity.

Vaccination intentions were assessed by asking participants to indicate their own intention to receive the HPV vaccine using a four-point scale (ranging from 'very unlikely' to 'very likely'). We also asked participants: "do you think that your parents would let you have the HPV vaccine" ('no', 'not sure', 'yes').

We examined adolescents' perceptions of their parents' beliefs by asking them to respond to five statements assessing what they thought it would mean if their parents allowed them to have the HPV vaccine (responding on a five-point scale from 'strongly disagree' to 'strongly agree'). Beliefs about sexual behaviour were examined in two statements (e.g. 'If my parents let me have the HPV vaccine it would mean that they think that I am old enough to have sex'), and three statements examined beliefs about vaccination/cancer (e.g. 'If my parents let me have the HPV vaccine I would know that they agreed with vaccinations in general'). The study was approved by the UCL research ethics committee, the school provided proxy consent for parents, and all participants provided informed consent.

Analysis

There were 173 adolescents who completed the survey from one school year and no-one refused to complete the survey. Eleven cases were excluded due to large amounts of missing data (>50%) leaving responses from 162 adolescents in the analysis. Data were analysed in SPSS version 15.0. Preliminary analysis demonstrated that the data was not normally distributed and this was resolved using log transformations.

Hypothesis testing is dependent on data being normally distributed and logarithms provide a method for normalising skewed data. We have presented the non-transformed data for descriptive analysis to make the interpretation simpler but inferential analysis used the transformed scores. Too few participants identified themselves as belonging to certain ethnic and religious groups to make statistical comparisons so these groups were aggregated and labeled as 'other'. ANOVAs were performed to establish differences between groups for intention to receive the vaccine. Pearson's correlations and ANOVAs were used to explore whether the statements assessing the perceptions of meaning behind parents' HPV vaccination consent could be predicted by the variables under investigation. As there were a large number of items assessing perceptions of meaning behind parents' HPV vaccination consent, a significance level of $p<.01$ was used for analysis of these items to reduce the risk of a type 1 error.

Results

The mean age of the respondents was 14.6 (ranging from 14-15). The majority described themselves as White (73%), with 11% Asian, 11% 'other' and 6% who did not respond to the ethnicity question. Christian religious denomination was the most common (55%) with 22% having no religion, 9% Muslim, 5% 'other' and 18% did not respond. Of those who reported having a religion, 24% said they were practising it (64% were not and 9% did not respond).

Most girls said that they were 'very likely' or 'likely' to have the HPV vaccination if they were offered it (91%) and 72% believed that their parents would let them have it (4% did not think their parents would let them have the vaccine, 15% were not sure and 10% did not respond). Intention to receive the vaccine was not related to age ($F(1,160)=2.59$, $p=.11$), ethnicity ($F(2,150)=.34$, $p=.71$), religion ($F(3,134)=1.84$, $p=.14$), whether they were practising a religion ($F(1,86)=3.63$, $p=.06$) or whether they believed that their parents would let them have the vaccine ($F(2,143)=.32$, $p=.73$).

Some adolescents 'strongly agreed' or 'slightly agreed' that parental consent to vaccination implied that they were old enough to have sex (8%; Table 1) or that it was okay for them to be sexually active (10%). However, most adolescents would take positive health messages from parental consent to HPV vaccination, seeing it as indicating general approval of vaccinations (54% 'strongly agreed' or 'slightly agreed') and a desire to protect their daughter against cervical cancer (88% 'strongly agreed' or 'slightly agreed') and sexually transmitted infections (80% 'strongly agreed' or 'slightly agreed').

None of the items assessing perceptions of the meanings behind parents' HPV vaccination consent were related to whether adolescents believed their parents would consent to vaccination, nor could they be predicted by the adolescents' own intention to receive the vaccine, age, ethnicity, religion or whether they were practising a religion.

Page 231 - - >

----INSERT TABLE 1 ABOUT HERE----

Discussion

In this questionnaire study, we explored whether female adolescents intended to receive the HPV vaccine and whether they thought their parents would consent to them having the vaccine. We also assessed what adolescents believed their parents' HPV vaccination decisions would mean regarding their expectations about sexual behaviour. We found beliefs about vaccination decisions to be mostly positive with adolescents expressing strong intentions to receive the vaccine. Most believed their parents would let them have the vaccine and this finding is somewhat comparable to levels of vaccine acceptance from other UK studies of parents' intentions (72% compared with 81%) [3], and initial reports of actual vaccination uptake (84%) [6]. The adolescents reported that they would infer fairly positive messages about vaccination and cancer prevention if their parents consented to vaccination. Almost all the adolescents agreed that being allowed the HPV vaccine meant that their parents wanted to protect them against cervical cancer and sexually transmitted infections. Most adolescents did not believe that vaccination consent implied approval for them to be sexually active. Parents concerned about negative changes in sexual behaviour following vaccination may be reassured by this.

However, some adolescents would perceive implicit approval for sexual activity if they were allowed the vaccine. These beliefs provide some support for concerns previously expressed by parents [4], providing some support for the '*carte blanche*' concern about adolescent sexual behaviour change following HPV vaccination and highlight the importance of parent-daughter communication about sex. These findings are concerning and have implications for the sexual behaviour of adolescent girls, however, caution is needed as this was a small

Page 232 - - >

study, the effect sizes were small and the pre-defined items might have primed the girls to agree with issues they may not have previously considered. Additionally, even if adolescents believe that sexual activity has been condoned, this does not mean that they will necessarily become sexually active. Study of adolescents' responses to these items in alternative settings, and assessment of their freely recalled beliefs about the HPV vaccine would be valuable.

Adolescents may benefit from talking to their parents about the HPV vaccine. Although the vaccination is being presented in the UK as a vaccination against cervical cancer, the sexually transmitted nature of the virus is referenced in information leaflets designed for adolescents. Providing parents with guidance in how to have conversations about sex with their daughters so that they feel confident that vaccination will not influence their sexual behaviour and helping parents explain why the vaccine is being given might be a useful strategy. Furthermore, vaccination programme coordinators should ensure that information materials and campaigns highlight the reason that the vaccine is being given before the onset of sexual activity, explain that adolescents do not have to wait until they are ready to have sex before having the vaccine (as is the case with the current leaflet used by the NHS in England, Wales and Northern Ireland) and emphasise that the vaccine is protective against HPV only and not other STIs.

Participants in the present study were slightly older than the cohort who will receive the vaccine as part of the standard immunisation programme; however this age group will be included in the one-off 'catch-up' series. Girls who are already sexually active may be more liable to change their sexual behaviour following vaccination and

this older age group are more likely to have begun engaging in sexual relationships than 12-13 year olds in the main immunisation programme. Furthermore, young women who receive the vaccine as part of the routine immunisation programme will approach sexual debut knowing that they are protected against HPV and it is important to explore what older adolescents believe about the vaccine and the protection it affords. Thus this study examines and improves understanding of the issues relating to sexual behaviour in an appropriate age group.

Limitations

The participants of the study attended one high-achieving, secondary school, the majority were White and the sample size was small. We did not ask about the sexual status of the adolescents which may have influenced how they responded. This limits how generalisable the results are to other British adolescents. Adolescents' intentions in the present study were assessed hypothetically; actual uptake in the UK will not be known until the end of 2009 when the first cohort has completed the vaccination course. Additionally, adolescents may have inaccurate beliefs about their parents' vaccination intentions, although the findings of this study are comparable to studies assessing actual parental vaccination intentions [3].

Conclusions

This study provides an insight into the beliefs of adolescent girls who are due to receive the HPV vaccine as part of the 'catch-up' programme. The majority of the girls intended to be vaccinated, and would infer positive messages if their parents consented to them having the vaccination. However a small minority of the adolescents would infer permissive messages about sexual behaviour from being allowed the vaccine. Information materials must highlight the reason that the vaccine is being given before the onset of sexual activity and that adolescents do not have to wait until they are ready to have sex before having the vaccine.

Acknowledgments

We would like to thank Professor Jane Wardle for her comments on drafts of this article.

Disclosure of conflicts of interest

We have received funding or honoraria from Sanofi Pasteur MSD and GSK Biologicals, both of whom manufacture HPV vaccines.

Contribution of authorship

Alice Forster, Laura Marlow and Jo Waller designed the study, Alice Forster drafted the paper and all the investigators contributed to writing and reviewing it.

Details of ethical approval

This study received ethical approval from the University College London research ethics committee (1399/001, approved 8th February 2008).

Funding

Jo Waller and Laura Marlow are supported by Cancer Research UK. Alice Forster is supported by a studentship from the UCL medical school.

Reference list

(1) Walboomers JMM, Jacobs MV, Manos MM, Bosch FX, Kummer JA, Shah KV et al. Human papillomavirus is a necessary cause of invasive cervical cancer worldwide. Journal of Pathology 1999; 189(1):12-19.

(2) Rambout L, Hopkins L, Hutton B, Fergusson D. Prophylactic vaccination against human papillomavirus infection and disease in women: a systematic review of randomized controlled trials. Canadian Medical Association Journal 2007; 177(5):469-479.

(3) Brabin L, Roberts SA, Farzaneh F, Kitchener HC. Future acceptance of adolescent human papillomavirus vaccination: A survey of parental attitudes. Vaccine 2006; 24:3087-3094.

(4) Bair RM, Mays RA, Sturm LA, Zimet GD. Acceptability of the human papillomavirus vaccine among Latina mothers. Journal of Pediatric and Adolescent Gynecology 2008; 21(6):329-334.

(5) Waller J, Marlow LAV, Wardle J. Mothers' attitudes towards preventing cervical cancer through human papillomavirus vaccination: A qualitative study. Cancer Epidemiology, Biomarkers and Prevention 2006; 15(7):1257-1261.

(6) Department of Health. HPV vaccination programme: first, second and third dose vaccine uptake by June 2009. Department of Health [2009 Available from: URL:http://www.immunisation.nhs.uk/publications/HPV_VaccineUptake_June2009.pdf]

Table List

Table 1 - Number and percentage of adolescents agreeing with each attitude statement and by intention

Table 1 – Number and percentage of adolescents agreeing with each attitude statement and by intention

(N=162)		Intention		
	Whole sample *n* (%)	**Very unlikely *n* (%)**	**Unlikely *n* (%)**	**Likely *n* (%)**
If my parents let me have the HPV vaccine it would mean that they think that I am old enough to have sex				
Strongly disagree	32 (19.8)	0 (0)	0 (0)	14 (18.9
Slightly disagree	71 (43.8)	5 (71.4)	5 (62.5)	28 (37.8
Unsure	47 (29.0)	1 (14.3)	2 (25.0)	26 (35.1
Slightly agree	9 (5.6)	0 (0)	1 (12.5)	6 (8.1)
Strongly agree	3 (1.9)	1 (14.3)	0 (0)	0 (0)
If my parents let me have the HPV vaccine I would know that they think it is ok for me to be sexually active				
Strongly disagree	23 (14.2)	1 (14.3)	0 (0)	11 (14.9
Slightly disagree	78 (48.1)	3 (42.9)	3 (37.5)	34 (45.9
Unsure	45 (27.8)	1 (14.3)	2 (25.0)	24 (32.4
Slightly agree	12 (7.4)	1 (14.3)	3 (37.5)	4 (5.4)
Strongly agree	4 (2.5)	1 (14.3)	0 (0)	1 (1.4)
If my parents let me have the HPV vaccine it would mean that they wanted to protect me against sexually transmitted infections				
Strongly disagree	2 (1.2)	0 (0)	0 (0)	0 (0)
Slightly disagree	4 (2.5)	0 (0)	0 (0)	2 (2.7)
Unsure	26 (16.0)	4 (57.1)	1 (12.5)	13 (17.6
Slightly agree	87 (53.7)	3 (42.9)	6 (75.0)	47 (63.5
Strongly agree	43 (26.5)	0 (0)	1 (12.5)	12 (16.2
If my parents let me have the HPV vaccine it would mean that they wanted to protect me from cervical cancer				
Strongly disagree	2 (1.2)	0 (0)	1 (12.5)	0 (0)
Slightly disagree	3 (1.9)	0 (0)	0 (0)	1 (1.4)
Unsure	14 (8.6)	1 (14.3)	0 (0)	9 (12.2)
Slightly agree	92 (56.8)	6 (85.7)	6 (75.0)	50 (67.6
Strongly agree	51 (31.5)	0 (0)	1 (12.5)	14 (18.9
If my parents let me have the HPV vaccine I would know that they agreed with vaccinations in general				
Strongly disagree	3 (1.9)	0 (0)	0 (0)	0 (0)
Slightly disagree	17 (10.5)	2 (28.6)	1 (12.5)	5 (6.8)
Unsure	54 (33.3)	3 (42.9)	4 (50.0)	35 (47.3
Slightly agree	70 (43.2)	2 (28.6)	3 (37.5)	32 (43.2
Strongly agree	18 (11.1)	0 (0)	0 (0)	2 (2.7)