

Analysis of HPV Vaccination Willingness among Age-appropriate Women in L Village, Longkou City, Shandong Province

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Abstract: Objective: To find out the HPV vaccination willingness and the vaccination price preference among age-appropriate women in L Village, Longkou City, Shandong Province, and to analyze the related influencing factors. **Methods:** In February 2022, 168 women of appropriate age from L Village, Longkou City, Shandong Province were investigated by using a self-made questionnaire with equidistant sampling method, and analyzed by χ^2 test and logistic regression. **Results:** Among 168 respondents, the average correct rate of relevant cognitive answers was 46.8%, and 65 respondents (38.69%) were willing to receive HPV vaccination. Multi-factor logistic regression analysis showed that the willingness of vaccination rate of respondents increased with the increase of education level, income level and gynecological physical examination frequency ($P < 0.05$). Compared with tetravalent vaccine, those with lower education level and poor cognition were more inclined to receive bivalent vaccine, while those with younger age and poor cognition were more inclined to receive nine-valent vaccine ($P < 0.05$). **Conclusion:** The overall cognition level of HPV and HPV vaccine in L village of Longkou City, Shandong Province was low, and the vaccination willingness was low. Reducing the cost of vaccine and strengthening the publicity and education can improve the vaccination rate of HPV vaccine to a certain extent

1. Introduction

Cervical cancer is the fourth most common cancer among women and the main cause of cancer death among women in developing countries ^[1]. HPV vaccination as a primary means of prevention can greatly reduce the incidence rate and mortality of cervical cancer. In recent years, the incidence rate of cervical cancer in China has been increasing at an average rate of 8.7% per year, and the growth rate in rural areas is as high as 10.3% ^[2,3]. It is urgent to improve the HPV vaccination rate of rural women. China has approved the listing of bivalent, tetravalent and nine-valent HPV vaccines since 2016, but the vaccination situation of domestic population is extremely uneven at this stage. The HPV vaccination rate of rural women is far lower than that of urban women. In terms of vaccination valent, we are faced with the dilemma of “one shot is difficult to obtain” of nine-valent HPV and “being neglected” of bivalent and tetravalent vaccines ^[1]. This survey provides feasible suggestions for improving the coverage of HPV vaccine among rural women by analyzing the willingness and influencing factors of HPV vaccine among age-appropriate women in

L village, Longkou City, Shandong Province. The valent selection and influencing factors are analyzed to supplement the deficiencies of the existing research on the valent preference of vaccination.

2. Respondents and Method

2.1 Respondents

Using the method of equidistant sampling, the rural women aged 18-45 registered in L village, Longkou City, Shandong Province were investigated in February 2022, and the electronic questionnaire was distributed to them on a voluntary basis. 173 questionnaires were distributed and 168 valid questionnaires were recovered, with an effective rate of 97.11%.

2.2 Investigation Methods

Using the questionnaire method, based on literature review and pre-investigation, the questionnaire “Survey of HPV Vaccination Willingness of Rural Age-appropriate Women” was designed, and the consistency reliability of the questionnaire was evaluated by Cronbach’s α . The coefficient was 0.832 and the KMO value was 0.856. The reliability and validity were good. The content involved three parts: the basic information of the respondents, the cognition of HPV and HPV vaccine, the vaccination willingness of HPV vaccine, the preference of vaccination valent, the factors of concern and the information source channel, with a total of 19 questions. The 11 questions in the questionnaire related to the cognitive survey were assigned and scored, with a correct score of 1, an error score of - 1, and an unknown score of 0. The total score range was - 11 ~ 11.

2.3 Data Processing and Analysis Methods

SPSS 23.0 was used for descriptive analysis, χ^2 test and Logistic regression analysis, showing that the difference was statistically significant with the test level of $P < 0.05$.

3. Results

3.1 Basic Information of Respondents

144 respondents (85.71%) were aged 27-45 years; 62 people (36.9%) had junior high school education or below, followed by 50 people (29.76%) with university or college education. The average monthly income of 68 families was 3-5 thousand yuan (40.48%); 74 people said that gynecological examination would be carried out only when they were unwell (44.05%); 65 people (38.69%) said they had been vaccinated or would be vaccinated with HPV vaccine in the future, of which 12 preferred bivalent vaccine, 27 preferred tetravalent vaccine and 26 preferred nine-valent vaccine.

3.2 Cognition of Cervical Cancer and HPV Vaccine among Respondents

The correct rate of respondents’ answers to the cognition of cervical cancer and HPV vaccine ranged from 22.6% to 63.1%, with an average correct rate of 46.8%,

which was generally low. The answers of each question had statistical significance on the difference of HPV vaccination intention. The correct rate of those who were willing to be vaccinated was significantly higher than those who were unwilling to be vaccinated ($P < 0.05$). The median of the total cognitive score is 0. Those with a total score greater than 0 are considered as good cognitive, and those with a total score less than or equal to 0 are considered as poor cognitive. The results are shown in Table 1.

Table 1 Knowledge of HPV and HPV vaccine

Question(accuracy)	Answer situation	Willing to vaccinate	Unwilling to vaccinate	χ^2 value	P value
		Number (proportion)	Number (proportion)		
Cervical cancer virus is mainly transmitted through sexual behavior (50.6%)	Yes*	42(64.62%)	43(41.75%)	8.363	0.015
	No	18(27.69%)	48 (46.6%)		
	Unknown	5 (7.69%)	12(11.65%)		
Cervical cancer virus infection is usually transient and most of them can heal themselves (22.6%)	Yes*	28(43.08%)	10 (9.71%)	25.748	<0.001
	No	31(47.69%)	73(70.87%)		
	Unknown	6 (9.23%)	20(19.42%)		
Cervical cancer virus infection is very common (37.5%)	Yes*	36(55.38%)	27(26.21%)	14.769	0.001
	No	23(35.38%)	56(54.37%)		
	Unknown	6 (9.24%)	20(19.42%)		
Cervical cancer vaccination can prevent all cervical cancer (61.9%)	Yes	11(16.92%)	33(32.04%)	16.025	<0.001
	No*	52 (80%)	52(50.49%)		
	Unknown	2 (3.08%)	18(17.47%)		
Cervical cancer virus infection can cause oral cancer, condyloma acuminatum and anal cancer (50%)	Yes*	45(69.23%)	39(37.86%)	19.177	<0.001
	No	4 (6.15%)	30(29.13%)		
	Unknown	16(24.62%)	34(33.01%)		
Men will not be infected with cervical cancer virus (57.1%)	Yes	10(15.38%)	29(28.16%)	6.489	0.039
	No*	45(69.23%)	51(49.51%)		
	Unknown	10(15.39%)	23(22.33%)		
Correct use of condoms can prevent cervical cancer virus infection (63.1%)	Yes*	52 (80%)	54(52.43%)	13.885	0.001
	No	6 (9.23%)	31 (30.1%)		
	Unknown	7 (10.77%)	18(17.47%)		
The best time to vaccinate against cervical cancer is after the first sex (49.4%)	Yes	5 (7.69%)	32(31.07%)	29.406	<0.001
	No*	49(75.38%)	34(33.01%)		
	Unknown	11(16.93%)	37(35.92%)		
Cervical cancer virus	Yes*	30(46.15%)	20(19.42%)	16.491	<0.001

infection usually does not cause symptoms (29.8%)	No	30(46.15%)	58(56.31%)		
	Unknown	5(7.7%)	25(24.27%)		
Smoking may induce cervical cancer (38.7%)	Yes*	37(56.92%)	28(27.18%)		
	No	15(23.08%)	38(36.89%)	14.915	0.001
	Unknown	13(20%)	37(35.93%)		
Cervical cancer infection can be cured by vaccination against cervical cancer (54.2%)	Yes	11(16.92%)	36(34.95%)		
	No*	49(75.38%)	42(40.78%)	19.576	<0.001
	Unknown	5(7.7%)	25(24.27%)		

Note: * indicates the correct answer to this question

4. Discussion

This survey shows that the overall cognitive level of age-appropriate women in L village, Longkou City, Shandong Province on cervical cancer and HPV vaccine is low, which is consistent with the survey conclusions of 1139 rural women in a place in Sichuan Province from June to July 2017^[3] and 280 rural women in Henan Province from July to August 2018^[5]. The overall cognition level of HPV and HPV vaccine among rural women is much lower than that of urban women^[6]. Age, education level, economic conditions, media contact and cervical cancer screening are all influencing factors of HPV and vaccine cognition^[4,7]; Education level may be the main factor affecting the willingness to vaccinate HPV, that is, the higher the education level, the higher the willingness to vaccinate^[8,9,17].

5. Conclusion

The age-appropriate women in L village, Longkou City, Shandong Province have a low awareness of HPV and vaccine and vaccination willingness as a whole. Education level, income and gynecological examination frequency are the influencing factors of HPV vaccination willingness, while age, education level and cognition are the influencing factors of HPV vaccination valent. The public management body should speed up the process of incorporating HPV vaccine into the national immunization plan and medical insurance, establish and improve the cost sharing mechanism and reasonable vaccine supervision mechanism, and cooperate with multiple subjects to strengthen the publicity and education of relevant knowledge, so as to effectively improve the HPV vaccine coverage of rural age-appropriate women and reduce the harm of cervical cancer to rural women.

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