High-Risk Types HPV DNA Test On Women With Multiple Sexual Partner Versus Single Sexual Partner

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Abstract

Background: The high-risk types of human papillomavirus (HPV) are a major cause of invasive cervical cancer and cervical intraepithelial neoplasia. New methods have been developed for the detection of cervical cancer, including examining molecular HPV DNA detection in vaginal and cervical samples. Women with multiple sexual partners have a higher risk of cervical cancer. This study was determined to seek the difference of high-risk HPV DNA test results between women with multiple sexual partners versus single sexual partner.

Method: This study was an observational analytic study with a cross-sectional design. Participants were 20 women with multiple sexual partners in prostitution areas and 20 single sexual partner women. Sampling for HPV DNA test was done by medical doctors and midwives. High-risk HPV DNA tests were examined with hybrid capture technique at Prodia Laboratory.

Result: Among 40 participants, 9 participants from multiple sexual partners, and 3 participants from a single sexual partner were positive of high-risk HPV DNA test (p=0.038). The results of the prevalence rate (PR) analysis showed a value of 3.00 with confidence interval of 95% (lower 0.95- upper 9.477).

Conclusion: There was a significant difference between high-risk HPV DNA tests in women with multiple sexual partners compared to women with single sexual partner. Women with multiple sexual partners are at risk to get a positive of the high-risk HPV DNA test for 3.00 times than women with single sexual partner.

INTRODUCTION

Cervical cancer is the fourth most frequent cancer in women representing 6.6% of all female cancers in the world.1 In Indonesia, cervical cancer ranks second out of the ten most cancers based on data from Anatomy Pathology in 2010 with an incidence of 12.7%.2 Detection of cervical cancer in women between the ages of 30 and 49 years, even just once, will reduce deaths from cervical cancer. High-risk types of human papillomavirus (HPV) are a major cause of invasive cervical cancer and cervical intraepithelial neoplasia.3 New methods have been developed to detect cervical cancer. One way is the examination of molecular HPV detection.4 If high-risk HPV is detected, the HPV infection may be persistent. The persistent HPV infection is the cause of all cervical cancer cases, positive test results in women over 30 years indicate that they have lesions that already exist or will have a risk of pre-cancer and cancer in the future.5 There are several risk factors for cervical cancer, first sexual intercourse under 16 years, multiple sexual partners, smoking, race, high parity, low socioeconomic status, and chronic immune suppression.4,6 All women are at risk for cervical cancer, but some evidence shows a strong relationship between sexual activity and the risk of cervical cancer, that is women who have sexual intercourse at an early age and women with multiple sexual partners have a higher risk of cervical cancer.7,8 This study was determined to seek the difference of high-risk HPV DNA test between women with multiple sexual partners versus women with a single sexual partner.

MATERIALS AND METHODS

Design

This cross sectional study was an observational analytic and conducted in Obstetrics and Gynecology Department, Oncology Gyencology Division of Faculty of Medicine, Padjadjaran University/Dr. Hasan Sadikin General Hospital and Laboratory of Prodia from April 2019 to May 2019. This research was to study the dynamics of relationship between the risk factors and their impact. The risk factor and the impact were observed at the same time, and measured according to the condition at the time of observation, so every participant was observed at once.

Participants and recruitment

The selection of participant was done by consecutive sampling. The inclusion criteria were participant with multiple sexual partner, and single sexual partner who had given their written consent to participate in this study, aged 30-50 years, sexually active for 2 years, had high sexual activity with more than 2 partners, and had sexual activity with frequency of 3 times / week with one partner for women with single sexual partner were recruited into study population. Participant who had chronic disease or immune-suppressive disease were excluded in this study. Characteristics of the participants will be obtained from interview. Determination of sample size for unpaired categorical analytical research uses a sample formula to test hypotheses between two populations from the sample size 2.0 program from Hosmer and Lemeshow (Z 1,96, Z 0.84, p1 50%, p2 10%), the formula is :

$$n = \frac{\left[Z\alpha\sqrt{2P(1-P)} + Z\beta\sqrt{P_1(1-P_1)+P_2(1-P_2)}\right]^2}{(P_1-P_2)^2}$$

$$n = \frac{\left[1{,}96\sqrt{2*0{,}3(1-0{,}3)} + 0{,}84\sqrt{0{,}5(1-0{,}5)+0{,}1(1-0{,}1)}\right]^2}{(0{,}5-0{,}1)^2}$$

19,36 was targeted for the study. A total of 20 patients for each group participated in this study.

Variables and measurements

Independent variable in this study was women with multi-sexual partner and single sexual partner, and dependent variable was a positive high-risk HPV DNA test. Sampling for HPV DNA test was done by medical doctor and midwives. The high-risk HPV DNA test was examined with hybrid capture technique at Prodia Laboratory

Statistical analysis

Data were analyzed using SPSS version 20.0. Univariate analysis was used to generate frequencies and percentages of categorical variables. Numerical data were tested by unpaired T-test if the data were normally distributed with an alternative Mann Whitney test if the data were not normally distributed. Categorical data were tested by Chi-Square test with an alternative Kolmogorov Smirnov and Exact Fisher test if the terms of Chi-Square were not met. Ratio of prevalence was measured in this study. Level of statistical significance (p-value) was set at 0.05, and confidence interval 95%.

RESULTS

Total participants were 40 women who fulfilled the inclusion and exclusion criteria. Table 1 showed the characteristics of participants between multiple sexual partners and single sexual partner groups. The p-value obtained at each characteristic is more than 0.05 (p>0.05), indicating that both groups are homogeneous and feasible to continue the statistical test. Table 2 shows the significant result of high-risk HPV DNA tests in multiple sexual partners and single sexual partner groups (p=0.038). In this study we calculate the prevalence ratio to seek the possibility of the risk factor to its impact. The results of the prevalence rate analysis showed a value of 3.00 with confidence interval 95% (0.95-9.477).

Table 1

	Multi sex partner (n=20)	Single sex partner (n=20)	p value
Age			
Mean (SD)	33.7 (3.86)	33.45 (3.85)	0.937
Range	30-38	30-36	
Parity			
Mean (SD)	0.85 (0.745)	2.4 (0.754)	0.850
Range	0-2	2-4	
Menarche			
Mean (SD)	12.45 (1.19)	12.35 (0.98)	0.405
Range	11-15	11-14	
Age of first sexual intercourse			
Mean (SD)	17.95 (1.05)	23.4 (2.06)	0.136
Range	17-20	22-26	
Smoking			
Mean (SD)	12.4 (0.681)	0.7 (0.923)	0.127
Range	12-14	0-3	
Hormonal contraception			
Ever	12	10	0.267
Never	8	10	

SD; standard deviation

Table 2

		High-risk HPV DNA Test		Total	p value	PR	CI 95%
		Positive	Negative				Lower-Upper
Multi-sexual partners	Yes	9	11	20	0.038	3.000	0.950-9.477
	No	3	17	20			
Total		12	28	40			

PR; prevalence rate, CI; confidence interval

DISCUSSION

The HPV infection is self-limiting and usually transient but may persist and developed to high-grade lesions and cancer. High-risk HPV types infection, high viral loads, and genetic predisposition contribute to the progress of cervical cancer.9 The relationship between genital HPV infection and cervical cancer was first demonstrated in the early 1980s.3 Several studies have shown that testing of high-risk types of HPV DNA in women can help identify who already had or are candidates for high-grade intraepithelial neoplasia or cervical cancer.10 The relative risk of cervical cancer correlated with high-risk types of HPV is higher than the risk of lung cancer associated with smoking.9 The high-risk HPV types were found in 87.8% of squamous cell carcinomas (SCC) using PCR-based line blot assay and HPV typing was as follows, HPV 16 (66.7%), HPV 18 (19.4%), HPV 33 (5.6%), HPV 35 (5.6%), HPV 45 (4.6%), HPV 52 (2.8%), HPV 58 (2.8%), HPV 59 (2.8%) and HPV 73 (2.8%).11,12.

The characteristics of participants consist of age, parity, menarche, age of first sexual intercourse, smoking, and hormonal contraception were asked to the participants by interview. These factors could be confounding factors on the results of this study, so to compare the two research groups, characteristics of the subjects must be homogeneous. From table 1, the p-value at age (p = 0.937), parity (p = 0.85), menarche (p = 0.405), age first sexual intercourse (p = 0.136), smoking (p = 0.127), and hormonal contraception (p = 0.267) were more than 0.05, proved that there were no significant differences in the participant's characteristics, so it could be concluded that the two groups were homogeneous, expected bias due to these factors could be removed, and the two groups were deserved to be compared.

Table 2 shows there was a significant difference between the multiple sexual partners to the positive of high-risk HPV DNA test, among 40 participants, 9 participants from the multi-sexual partner, and 3 participants from single sexual partner group were positive of high-risk HPV DNA test (p=0.038). Prevalence rate (PR) value also showed there was a relationship between women with multiple sexual partners to the incidence of cervical cancer. The result of PR value was 3.00, with CI 95% lower-upper (0.95 - 9.477). The PR value of 3.00 implicated that the possibility of women with a multi-sexual partner had a positive high-risk HPV DNA test for 3.00 times compared to non-multi-sexual partner. The tendency to suffer from high-risk HPV type infections is 3 times greater in women with multiple sexual partners than women with single sexual partners. The results of the 95% CI lower limit was 0.95, and the upper limit was 9.477, so the assumption of multiple sexual partners as a risk factor for cervical cancer is getting stronger. This is supporting the existing theories related to sexual behavior, Fritzgerald, Stany, and Hamilton explained that women who have multiple sexual partners are at risk of developing cervical cancer.13 A compilation of analyzes conducted by the International Agency for Research on Cancer has confirmed that the number of sexual partners is a significant risk factor for HPV infection.14 However, whether the number of sexual partners is a risk factor for cervical cancer has not been well documented. Some previous studies have shown that the number of sexual partners is an independent factor in cervical cancer.15

Research conducted by Liu et al. in 2015, forty-one studies included in this meta-analysis, observed that the number of sexual partners associated with the occurrence of non-malignant cervical disease with the OR value = 1.82, 95% CI 1.63-2 .00 while related to the occurrence of invasive cervical carcinoma with OR value= 1.77, 95% CI 1.50-2.05. The study concluded that having multiple sexual partners is a potential risk factor for cervical cancer.16 From this study, it can be concluded that there was significant difference in high-risk HPV DNA test in women with multiple sexual partners compared to women with a single sexual partner. Women with multiple sexual partners are at risk to get positive of the high-risk HPV DNA test for 3.00 times compared to a single sexual partner.

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