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Cervical Cytology and HPV Genotype Type 16 and 18 Infection in Female Commercial Sex Workers in Makassar

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ABSTRACT *---The study aims to determine the cytology and type of human papilloma virus (HPV) in commercial female sex workers in Makassar. This descriptive study was performed on cervical fluid samples from 80 female sex workers. The cytological examination was performed using the Thin Prep Pap Test and the DNA HPV detection (genotyping) using the reverse dot blot "flow through" hybridization method. In this research most of the female commercial sex workers in Makassar have non specific cervicitis, Non-specific cervicitis was present in 48(60%) samples and negative lesions in 32(40%) samples. HPV DNA testing (HPV genotyping) show that the prevalence of high risk HPV types 16 and 18 in this study was low, HPV type 16 only found in 5 samples whereas type 18 was absent. Proportion between high risk HPV (other than types 16 and 18) and low risk is comparable.*

Keywords --- Cervix *Cytology; HPV Genotype; Female Commercial Sex Workers.*

I. INTRODUCTION

Cervical cancer is the third most common type of cancer in the world. Cervical cancer in developing countries is more often found in women of reproductive age even though cervical cancer is often found in women aged >50 years. This disease mostly diagnosed at an advanced and incurable stage in countries that do not have a good screening strategy (1). The prevalence and genotype of infecting HPV differ in every population. At present, there are two types of HPV vaccines for types 16 and 18 as a high-risk type of HPV. This vaccines significantly reduce the prevalence of HPV infections caused by these two types of HPV (2). However, the effect of HPV vaccination on the prevention of HPV infection and cervical cancer also differs regarding the distribution of HPV genotypes in each region.

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HPV infection in the cervix is an important event for cervical cancer; it is estimated 50-80% of sexually active women will be infected with HPV during their lives, and 80% will be free of infection and not detected in first 2 years and will not cause cancer. HPV types 16 and 18 are the main causes related to this disease. The progression from HPV infection to cervical cancer approximately 10-20 years. However, this infection process and pre-cancerous events mostly asymptomatic. (3,).

The risk of infection increases with the sexual activity (5,6). Female sex workers are the high-risk group for infected and transmitted HPV because they have more than one sexual partners (6). The prevalence of HPV type infection is vary regarding the population characteristics. A study on female sex workers in Cambodia show the prevalence of HPV types 51 and 70 is most dominant compared with type 16, 71, and 81 (7Couture et al., 2012). However, another study in Turkey reported most of the female sex workers are infected with HPV types-18, 16, and 50 (8). The predominant types related to HPV infection in Eastern-Asia consist of type 16, 18, 58, 56, and 52 whereas HPV infections in the Southeast Asia region are mainly caused by type 52, 16, 58, 18, and 66 (9).

Cervical cancer screening with cytological examination has reduced the incidence and the mortality rates of this disease. The screening method is effective due to this type of cancer has a long pre-invasive phase so that any transformation in the cervix could be detected before a malignancy or metastasis. This examination evaluates the cell morphological abnormalities resulting from cervical epithelial specimens. Conventional cytology examination has sensitivity 70-80% and specificity 94-97% to detect high-grade precancerous lesions (10). False-negative results are often found in this examination, and inadequate sampling and poor standard procedures will reduce the levels of sensitivity. The liquid-based cytological examination provides adequate specimens compared with the Pap smear cytological examination (1,11). Cytological and genotyping of HPV examination in female commercial sex workers are important regarding the risk of infection and transmission of HPV and the importance of educational programs for prevention and transmission of cervical cancer.

II. METHODOLOGY

Subjects

This descriptive study was conducted on female sex workers in Makassar from March to September 2018. Women work as sex workers, aged 15-50 years, sexually active with one or more sexual partners for the last 1 month, not menstruating, using tampons, vaginal drugs, vaginal contraception, and vaginal douche for 48 hours before the examination, not pregnant and without a history of local and systemic infections were eligible. Women are not allowed to have sexual intercourse within 24 hours before the examination. Ethical approval is given by the Research Ethics Committee Health, Faculty of Medicine, Hasanuddin University, Makassar.

Laboratory testing --- Cytological examination and HPV genotyping

Materials for HPV analysis were collected by rotating one cervical swab over the entire cervical surface and in the cervical os. Cytological examination performed with he liquid-based cytology (LBC) using the Thin Prep Pap Test whereas the HPV DNA detection (genotyping) performed with reverse dot blot "flow-through" hybridization method in Central Prodia Laboratory Makassar.

Data

Data presented as proportions in tables and graphs.

III. RESULTS

This descriptive study included 80 female sex workers. Most of the women aged 30 years old (61.3%), education <9 years (66.3%), married (77.5%), nulliparous (62.5%), working as a sex worker for more than 1 year (86.3%), age at starting as a sex worker ≥15 years (73%), age at first sexual intercourse ≥15 years (82.3%), number of sex partners in a month ≥5 (61.3%), 58.8% with last sexual partner for the last 1 month less than 5, and 96.3% with no history of sexually transmitted diseases. The proportion of these women using and not using condoms was comparable (50%), and all women never had HPV vaccines. The characteristics of the study samples are shown in table 1. The liquid-based cytology (LBC) examination show 60% women had non-specific and non-bacterial cervicitis (60%) and 40% had no lesions (table 2). The results of HPV DNA testing (HPV genotyping) found HPV type 16 found in 5 women among 80 women whereas type 18 was not found. The proportion between high risk HPV (other than types 16 and 18) and low risk is comparable (**figure 1**).

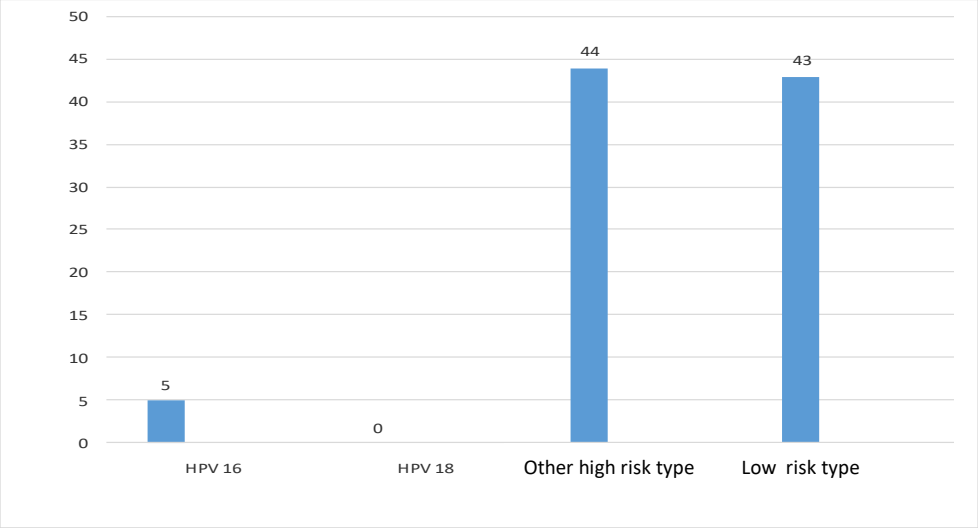
Table 1. Socio-demographic characteristics

Characteristics	n	%
Age (years)		
<30	31	38.8
≥ 30	49	61.3
Education (years)		
<9	53	66.3
≥9	27	33.8
Marrital status		
Not married	18	22,5
Married	62	77,5
Parity		
Multiparous	16	20
Primiparous	14	17.5
Nulliparous	50	62.5
Duration as sex worker (years)		
<1	11	13.8
≥1	69	86.3
Age at work as sex worker (years)		
<15	7	8.8
≥15	73	91.3
Age at first sexual intercourse (years)		
<15	14	17,5
≥15	66	82,5
Number of sexual partners in a month		

≥5	49	61,3
<5	31	38,8
Number of new sexual partners for the last 1 month		
≥5	33	41.3
<5	47	58.8
Using condom		
No/sometimes	40	50
Always	40	50
History of sexually transmitted infection (STI)		
Yes	3	3.8
No	77	96.3
HPV vaccine		
No	80	100

Table 2. Liquid base cytological examination results

Lesions	n	%
Non-specific cervicitis and bacteria	48	60
Negative lesions	32	40



IV. DISCUSSION

In the present study, we found most of the women have worked as a sex worker for more than 1 year. We also found that low and high-risk type of HPV infections in our study samples. The previous study show similar results with our findings that female sex workers who work for 6 months to 2 years at high risk for HPV infection (12).

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The risk of invasive cervical cancer due to HPV infection was higher among those who reported had early first sexual intercourse at ⩽16 years old compared with those age at ⩾15 years (13). Previous research show that an high-risk HPV infection and sexually transmitted infection (STI) in susceptible women is responsible for increase of invasive cervical cancer risk, that has been associated with early age at first sexual intercourse (14).

High rates of HPV infection in women at an early age at first sexual intercourse might be related with the transformation zone as the target tissue for HPV infection increases its size after menarche results in vulnerable to HPV infection (15). Early age at first sexual intercourse also will increase the number of sexual partners in later life with the result the risk of transmission of sexually transmitted diseases including HPV will increase. We found the women in our study had new sexual partners less than 5 for the last 1 month. A meta-analysis suggested that multiple sexual partners is a potential risk factor of cervical cancer with or without HPV infection (16).

The benefits of condoms in preventing HPV in women are still debating. A decrease in HPV infection in female sex workers who use condoms, but not fully effective in protecting against HPV infection. However, condoms cannot completely cover the infected area (17). The limitation of this study is we are not assessing the risk factors of female sex workers against the prevalence of HPV infection types. The strength of this study is we are using the highly sensitive method for HPV identification compare with the Pap smear as a conventional method.

The present study show most of the women had non-specific cervicitis. Similar results with this study show in the previous study show that female sex workers had more positive cervical pre-cancerous examination results than negative results (18). The previous study in the similar subjects in Makassar found non-specific chronic inflammation higher compared with precancerous lesions by the Pap smear (19). Further analysis show cervicitis is a risk factor for HPV infection (20).

Our findings also show the distribution of high-risk HPV genotypes was higher compared with low-risk of HPV. Similar results show in two previous studies (21,22). Compared to the general female population, female sex workers are 10 times more likely to be infected with HPV (9). High-risk type HPV infections including types 16 and 18 are also higher compared with low risk types (type 6 and 11) in Asia (9). In a review on the global perspective of HPV infection in women CSWs show higher prevalence of high risk type of HPV (type 16, 18, 31, 52, 58) compared with low risk type of HPV (type 6) (23).

The most common high-risk type of HPV infection in our study is type 16 compared with type 18. The previous study in several regions in Indonesia show the most common types of HPV infection were 52, 16, and 18 with a prevalence of type 16 infection is higher compared with type 18 (24). Studies and meta-analysis in the high-risk type of HPV infection in female sex workers show a higher prevalence of type 16 HPV infections compared with type 18 (9,23,25,26). However, another study found a higher prevalence of type 18 HPV infection compared with type 16 and 50 in female sex workers in Turkey (8). In contrast, HPV types 16 and 18 were not dominant in infecting female sex workers in Senegal (27). The absence of type 18 HPV infection in this study could be a further evaluation of the characteristics of female sex workers in Makassar that might be different from other populations. The discrepancies in infection prevalence among high-risk HPV types in female sex workers can be caused by discrepancies in population characteristics, sample size, and HPV identification methods used in different studies.

The quality of cytological examination depends on adequate sample collection, staining, screening methods, interpretations and reporting systems. Based on various studies results found the results of the validity cytological examinations vary and require repeat examination intervals to improve the effectiveness of the screening program. The effectiveness of cytological examination decrease in the old age group, and its effectiveness only 20% in women aged over 50 years. HPV DNA examination or genotyping has a sensitivity level three times higher compared with the cytological examination (28). Adequate method for screening HPV infection might increase the prevalence of HPV infection and further preventive strategies are needed to decrease the incidence of cervical cancer.

V. CONCLUSION

The Conclusion of this research is most of female commercial sex workers in Makassar have non specific cervicitis, proportion between high risk HPV (other than types 16 and 18) and low risk is comparable. The prevalence of high risk HPV types 16 and 18 in this study was low.

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