Factor Affecting Precancerous Lesions of Cervical Cancer Incidence in Kediri Indonesia

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Abstract— **Cervical cancer is an important health issue for women around the world. In Indonesia, according to data from the Information Systems of Hospital (SIRS) from 2007, cervical cancer ranks in the second position after breast cancer; the percentage of inpatients were 11.78% while outpatients were 17%. The number of cases of cervical cancer in Kediri city increases year by year: there were 165 cases in 2004, 170 cases in 2005, and 175 cases in 2006. The aim of this research was to determine the factors affecting the incidence of precancerous lesions in cervical cancers in Kediri. This research used analytic observational design with Retrospective Cross-Sectional approach. The population in this research was all women who have undergone cervical cancer screening with the IVA (Visual Inspection with Acetic Acid) method and had positive results in the Health Clinic in Kediri. This study used Quota Sampling technique with a lottery and questionnaire as a research instrument. Data were then analyzed using Factor Analysis with SPSS 19 software. The main factors that affect precancerous cervical lesions were age and parity while supporting factors that affects precancerous cervical lesions were the age of first marriage, the number of sexual partners, and smoking.**

Keywords- *analysis, factor, pre-cervical, cancer, lesions, sampling.*

I. INTRODUCTION

Cervical cancer is an important health problem for women around the world. In 2001, cervical cancer ranked as the second most common cancer in women and affects more than 1.4 million women worldwide. As of 2000, more than 460,000 cases occur each year and approximately 231,000 women die due to cervical cancer. In Indonesia, according to data from the Hospital Information System (SIRS) in 2007 cervical cancer ranks second only to breast cancer, in terms of hospitalized patients (11.78%) and outpatients (17%). In Kediri, a city in East Java, Indonesia, the number of cervical cancer cases continues to increase. In 2004, there was a total of 165 cases, 170 cases in 2005 and 175 cases in 2006. Early diagnosis of cervical cancer has been conducted since 1977 by using a Pap smear method. However, the Pap smear method has some disadvantages associated with the accuracy of its results, the inefficient technique, the limited human resources and lack of awareness among women to get an early diagnosis. Every woman is at risk of developing cervical cancer. Therefore, early detection and treatment of cervical pre-cancer should get primary attention.

Some indicators show an increased chance of getting cervical cancer including: 1) age: women aged 35–50 years and are still sexually active are vulnerable to cervical cancer; 2) age of first intercourse is also a risk factor for cervical cancer: about 20% of cervical cancers found in women who are sexually active before the age of 16 years; 3) the number of sexual partners contribute to the spread of cervical cancer: the greater number of sexual partners the higher of cervical cancer risk; 4) the frequency of pregnancy: this may also increase the risk of cervical cancer because of a history of infection of the genital area; and 5) smoking: women who actively smoke or passive smoking also increases the risk of cervical cancer (Wijaya, 2010).

Since 2004, the IVA method (Visual Inspection with Acetic Acid) has become widely used for early screening of cervical cancer in Indonesia. IVA is a cervical examination by applying 3–5% acetic acid to the cervix and observing for 1–2 minutes the thickened white plaque (act white epithelium). This visual test is used to detect pre-malignant cervical lesions. IVA can be used in various situations and conditions because it does not require laboratory tests and the results can be obtained quickly.

Kediri City Government attempted to cope with an increase in cases of cervical cancer in the town of Kediri by holding a training session about theIVA cervical cancer screening method for doctors and midwives in Kediri and also by organizing IVA examinations for 200 women of childbearing age.

Based on these problems and the importance of implementing the IVA cervical cancer screening method, we are interested in knowing the main factors affecting the incidence of pre-cancerous lesions of cervical cancer in Kediri.

II. METHODS

Research design

The research was conducted in July–September 2016 at Balowerti and Pesantren II Puskesmas (Health Center), Kediri City, East Java, Indonesia. This study used observational analytics with a Retrospective Cross-Sectional approach, where independent variables and the dependent variable were observed retrospectively at the same time. The sampling technique used in this study was quota sampling a with lottery technique and involved 30 respondents.

Population and sample

The population in this study was all women of childbearing age who had an IVA cervical cancer screening method with a

positive result in the area of Puskesmas (Health Center) in Kediri. The sample in this study was all women of childbearing age who had an IVA cervical cancer screening method with a positive result in Balowerti and Pesantren II Puskesmas (Health Center), Kediri.

Research instrument

The research instrument used in this study was a questionnaire, as well as the results of the IVA. The questionnaire, which was addressed to all respondents, asked about age, parity, age at first intercourse, the number of sexual partners and whether the participant smoked.

Data analysis

A univariate analysis was used to obtain an overview of each of the variables that included age, parity, the age at first intercourse, the number of sexual partners and smoking lifestyle in the form of the frequency distribution. Data analysis was performed by using SPSS software version 19. If the results of the KMO (Kaiser-Meyer Olkin) test indicated a value of > 0.5 and Bartlett test with a p-value ≤ 0.05, then the independent variable is considered as the main factor explaining incidence of pre-cancerous lesions of cervical cancer.

III. RESULTS AND DISCUSSION

The results of the study are presented in a graphical form which starts from general data then moves to more specific data. General data includes the characteristics of the respondents, education, and employment, while specific data include such as age, parity, the age at marriage, the number of sexual partners and smoking.
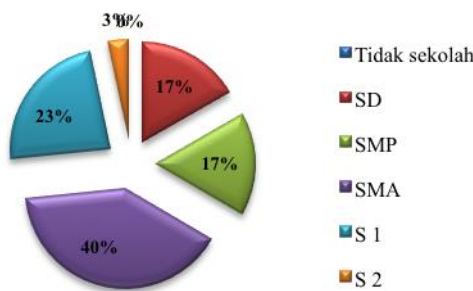
General Data

Figure 1. Characteristics of respondents by education level
Figure 1 shows that the characteristics of respondents by education mostly 12 respondents (40%) is at the senior high school level.
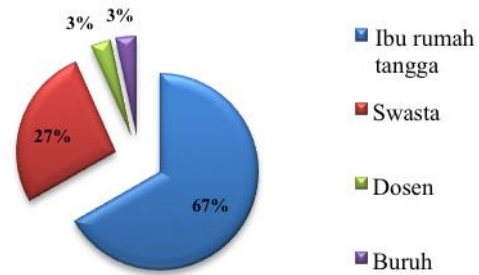

Figure 2. Characteristics of respondents by job
Figure 2 demonstrates that most of the respondents (67%) were housewives, while 27% of respondents worked in the private sector.

Specific Data

Specific data used in this study included age, parity, the age at marriage, the number of sexual partners and smoking lifestyle of respondents.
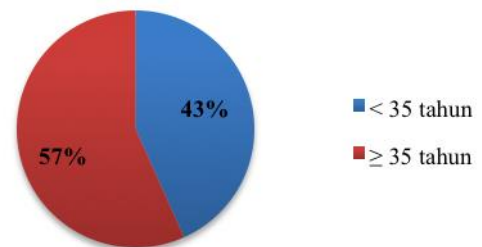

Figure 3. Characteristics of respondents by age
Figure 3 shows that the characteristics of respondents by age; respondents were mostly aged ≥ 35 years (57%), while 43% of respondents were < 35-year-old.
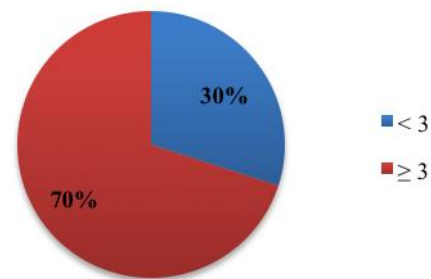

Figure 4. Characteristics of respondents by parity
As seen in Figure 4, 21 of 30 respondents (70%) reported having parity ≥ 3 times, while 30% of respondents reported having parity < 3 times.
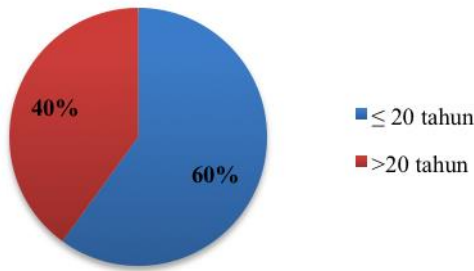
Figure 5. Characteristics of respondents by age of marriage
Figure 5 demonstrates that the age of marriage of 60% of respondents was ≤ 20 years old, while 40% of respondents had their first marriage at > 20 years-old.
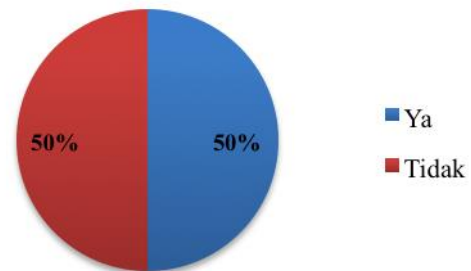

Figure 8. Characteristics of respondents by smoking lifestyle (passive smoking)
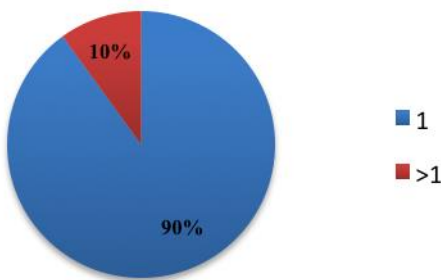Figure 8 demonstrates that 50% of respondents were passive smokers.

Figure 6. Characteristics of respondents by number of sexual partners
Figure 6 shows that 90% respondents had more than one sexual partner, while 10% of respondents had only one sex partner.
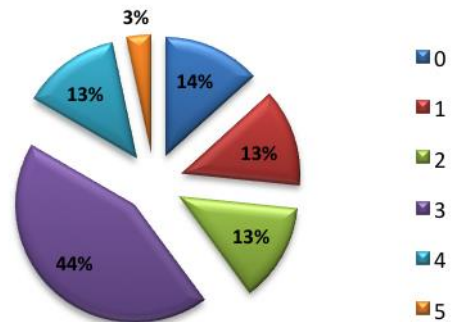

Figure 9. Characteristics of respondents by number of risk factors that affect the incidence of pre-cancerous cervical cancer lesions
Figure 9 shows that 13 respondents (44%) had 3 risk factors that affect the incidence of pre-cancerous cervical cancer lesions.

The common factors of pre-cancerous cervical lesions
a. Age
The result of the study of women of childbearing age with a positive IVA test result showed that the majority of respondents (56.7%) were aged ≥ 35 years-old. Women aged 35–50 years-old are still sexually active and vulnerable to cervical cancer. The common factor causing cervical cancers is by HPV (Human Papilloma Virus) infection, which is generally transmitted through sexual intercourse. HPV infection is influenced by the age and immunity of the patient. Women aged < 35 years-old have sufficient immunity against HPV infections, whereas women aged over 35 years old tend to have persistent HPV infections (Novel, 2009).
The risk of cervical cancer increases in women aged 35–60 years-old (Darwinian, 2006). Based on data from Ciptomangunkusumo General Hospital, the pattern of cervical cancer cases occurs at the early age of 20-years-old and reached the peak and settled at the age of 35 to 55-years-old (Lendawati, 2003). This is also closely related to a decrease in the immune system of the body at that age.
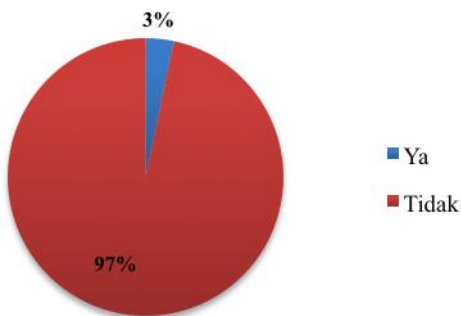

Figure 7. Characteristics of respondents by lifestyle smoking (smokers)
Based on Figure 7, only 3% of respondents were smokers while 97% of respondents were non-smokers.

b. Parity

In the present study, the majority of respondents, 21 of 30 persons (70%) had parity index ≥ 3. The frequency of pregnancy increases the risk of cervical cancer due to a higher risk of infection in the genital organs. Women with high parity are risk 5.5 times for cervical cancer (Setyarini, 2009). It has been assumed that the hormonal changes during pregnancy make the cervix more susceptible to HPV virus infection.

According to data by Riskesdas (Basic Health Research) in 2010, the number of parity increases with age; 98.4% women aged 20–24-years-old had parity index < 3, while 42.9% women aged 35–39-years-old had parity index ≥ 3. Women with high parity associated with the eversion of the columnar epithelium of the cervix during pregnancy, which causes a new dynamic immature metaplastic epithelium and may increase the risk of cell transformation and trauma to the cervix, causing persistent HPV infection.

Joeharno (2008) reported that parity is a risk factor for cervical cancer with a risk of 4.55 times in women with parity ≥ 3. A cohort study showed that HPV infection was easily found in pregnant women compared to non-pregnant women, due to the decline of the immune system during pregnancy (Sawaya, 2003). Another study also reported that during pregnancy, progesterone may induce HPV oncogenes to become unstable, which causes the integration of viral DNA into the host cell genome and lowers the mucosal immune transformation zone (Schift, 2000).

Supporting factors for pre-cancerous lesions of cervical cancer

a. Age of marriage

In the present study, women of childbearing age with a positive IVA test results showed that 60% of respondents married at the age of ≤ 20 years-old. The age of first intercourse is also a risk factor for cervical cancer, about 20% of cervical cancer found in women who are sexually active at the age of less than 16 years-old (Setyarini, 2009).

Joeharno (2008) reported that the age of marriage is a risk factor for the incidence of cervical cancer with a risk 2.54 times higher in women who had married at ≤ 20 years old compared with women with age of marriage > 20 years-old. Various studies have reported that there is a significant association between precancerous lesions and cervical cancer with sexual activity at a very young age, especially before 20 years-old. It may relate to histone complement of semen which acts as an antigen. The maturity of the immune system, especially cervical mucosa is still vulnerable, thus it might increase the risk of infection (Mega et al., 2008).

b. Sex partners

In this study, 90% of respondents with positive result of IVA test had more than one sex partner. The number of sexual partners also influences the occurrence of cervical cancer. Sperm has different specific proteins which may cause damage to the epithelial cells of the cervix. Cervical epithelial cells might tolerate and recognize these proteins. A woman with more than one sex partners has a higher risk of HPV infection due to the different specific proteins of sperm that cause damage without repair of cervical cells. The risk of cervical cancer in women with more than one sex partner is ten times greater than in women with one sex partner (Novel, 2010).

Research by Melva (2008) demonstrated that 23.3% of women with cervical cancer had more than one sex partner, while Suliyani (2008) found that 18.2% of women with more than one sex partner had a positive result in IVA test (precancerous lesions). Most patients (52%) in Dr. Kariadi Hospital, Semarang with cervical cancer had parity index > 3 (Khasbiyah, 2004). In the present study, the respondents mostly had sexual intercourse for the first time at the age under 20 years-old (74%) with one sexual partner (82%), which showed statistically that there is a significant relationship between parity and age at first sexual intercourse with the incidence of cervical cancer.

In this study, 13 respondents (43.5%) had three risk factors that influence the occurrence of pre-cancerous lesions of cervical cancer. But there were also four respondents (13.3%) with no risk factor. Their lesions may be caused by other unknown factors.

c. Smoking

Based on this present study, 29 respondents (90%) with positive result of IVA test was not an active smoker, while 50% of respondents were a passive smoker.

Based on Health Research in 2010, 4.2% of women in Indonesia were active smokers. In addition, based on the results of Socio-Economic Survey (Susenas, 2004) in cooperation with Promkes, Ministry of Health, and BPS (Statistical Cooperation) in 2004, reported that 1.4% of women in Indonesia were active smokers in 2001; this percentage increased to 1.7% in 2003 and 4.5% in 2004. Although most of the women were not smokers, the percentages of active smokers women in Indonesia increased significantly each year (Indonesian Heart Foundation, 2006).

Active smokers were at risk of cancer seven times greater than non-smokers. Tobacco contains carcinogenic substances; the mechanism appears to involve a soluble carcinogen which has a direct effect on cervical epithelial morphology change. Women who actively smoked had nicotine concentrations in cervical lymph 56 times greater than in the serum. This carcinogenic substance may cause cervical epithelial cell damage and increase the risk of HPV infection. This may lead to the formation of neoplasm (cancer cell population) of the cervix (Hidayati, 2001).

Several cohort studies have reported the relationship between smoking and invasive cervical cancer and many others have evaluated the relationship of a smoking habit with forms of pre-invasive neoplasm such as cervical intraepithelial neoplasia and cancer in situ (Vineis, 2004). Women as passive smokers were also at high risk for pre-cancerous lesions of the cervix. The present study stated that 50% of respondents were passive smokers. Active and passive smokers had an increased risk for cervical cancer two times greater than non-smokers (Tay, 2004). Nicotine and other toxins which circulate in blood through the cigarette smoke may lead to the formation of cervical neoplasia. Cervical neoplasia is the initial condition of developing cervical cancer.

IV. CONCLUSION

In summary, we reported that the main factor affecting the incidence of pre-cancerous lesions of the cervical cancer was the age and parity, while the supporting factors that influence the incidence of pre-cancerous lesions of cervical cancer are the age of first marriage, the number of sexual partners and smoking.

Suggestion

A. For Health Center
1. Providing information about the factors - risk factors that can cause pre-cancerous lesions of the cervix.
2. To immunize groups of women of childbearing age who are at risk.
3. Conducting regular screening for women of childbearing age group at risk.

B. For Kediri City Health Department
1. Working together across sectors to the minimum age requirement for women to get married.
2. Working together with the cross-sectoral of the rules of smoking restrictions.

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