VISUAL INSPECTION WITH ACETIC ACID (VIA) POSITIVE RESULTS AND PASSIVE SMOKER IN PUSKESMAS WONOAYU SIDOARJO

Catharina C Ursia[1)], JA Warsanto[2)], Endang Isbandiati[3)]

ABSTRACT

Introduction: Cervical cancer is a malignancy in women with the number one mortality and number two morbidity in the world. As many as 77% cases are found in developing countries, including Indonesia. Although deadly, screening programs can reduce the morbidity and mortality of this malignancy. Visual Inspection with Acetic Acid (VIA) is a cervical premalignancy screening method used in primary health care in Indonesia. Smoking is one of risk factor associated with cervical cancer and data from GATS, Infodatin 2015 & Riskedas 2013 states that the number of passive smokers in Indonesia is high.
Aim: The objective of this research is to look for the correlation between history of passive smoker and positive VIA
Methods: This research is a retrospective cross sectional analytic study. The data used in this study is the medical records of VIA screening visitors in 2016. The data were extracted on the research questionnaire. Data processing is done by using SPSS Statistics 23 For Windows computer software. The test is Chi Square correlation test and calculation of Prevalence Ratio (PR).
Result: 55 women (24.7%) had a history of passive smoking (daily cigarette smoke exposure), and 168 women (75.3%) had no daily cigarette smoke. 21 women (9.4%) received positive results, and 202 women (90.6%) received negative IVA. In the Pearson Chi-Square section, the Asymptotic Significance (2-sided) yielded results at 0.042 ($p < 0.05$)
Conclusion: There is a relationship between passive smokers with positive VIA results.
Keyword: Passive smoker, VIA, relationship

[1)] Student of Faculty of Medicine Widya Mandala Catholic University Surabaya, Kalisari Selatan 1 Surabaya Email: Catharinaursia@gmail.com
[2)] Obstetrics and Gynecology Department Faculty of Medicine Widya Mandala Catholic University Surabaya, Kalisari Selatan 1 Surabaya
[3)] Clinical Pharmacology Department Faculty of Medicine Widya Mandala Catholic University Surabaya, Kalisari Selatan 1 Surabaya

INTRODUCTION

Women's reproductive health is one of the country's references with regard to the optimal degree of health[1]. Many factors are affecting a woman's gynecological health, especially regarding infections and malignancy of the reproductive organs. These cause factors included women's low knowledge about reproductive health and health facilities that are not evenly distributed[2]. It can lead to a high prevalence of cervical cancer, especially in Indonesia.

Currently, cervical cancer is a malignancy in women with a mortality rate of number one and number two morbidity in the world. Every year 500,000 new cases of cervical cancer are found, and more than 250,000 deaths from cervical cancer[3]. Among cervical cancer cases in the world, 77% of cases are found in developing countries[2]. Data from Pusdatin (Data and Information Center) estimates 98,692 cases of cervical cancer in Indonesia. It is estimated that the most common case of cervical cancer is in the province of East Java, which is 21,313 cases[4].

Besides the high incidence rate, another problem is that almost 70% of cases in the hospital, the patients are already in an advanced state (more than IIB). At this stage, even the effectiveness of complete treatment still does not produce satisfactory results and still results in high mortality[3]. It should also be remembered that financing for handling cancer at an advanced stage is relatively more expensive than the cost of treating cancer at an early stage[5].

Although deadly, effective early detection or screening programs can reduce the morbidity and mortality of these malignancies[6]. The screening tests used include human papillomavirus (HPV) tests, cytology (Pap smears), and Visual Inspection with Acetic Acid (VIA)[7].

In developed countries, routine screening with the Pap smear method can reduce the risk of invasive cervical cancer, namely through early detection of praganas. The situation is different from the situation in developing countries. The number of women screened using the Pap smear method in developing countries is still low. The screening rate is low because women's knowledge of reproductive health is still lacking [2]. Rare Pap smear screening methods are also caused by the fact that there are still very few trained and professional staff with the skills to implement the program effectively. In practice in developing countries, histopathological services are also limited to large hospitals and laboratories in urban areas. These are obsta-

cles to the implementation of an effective screening program[6].

To overcome this problem, efforts can be made to increase the promotion of early detection of cervical cancer. Another effort needed is the implementation of an early cervical cancer detection program nationally. Although Pap smears are an ideal screening method, the use of these methods as a national screening program is still a barrier in developing countries[2].

It is necessary to solve the problem regarding the implementation of cervical cancer screening programs in Indonesia. The solution to this condition is the implementation of cervical praganas screening with an alternative method. Now, cervical cancer screening with IVA method has been used as an alternative method of Pap smear method in areas with limited facilities[8]. Various studies have shown that IVA is an appropriate screening method applied in primary health care in remote areas[8,9]. This is based on the advantages of IVA is a method of early detection of cervical cancer that is non-invasive and offers efficiency and effectiveness (simple method, immediate results are obtained) at an affordable price[6].

According to the Book of Obstetrics and Social Gynecology, cervical cancer is found in a population of women with a history of early sexual relations, a history of multipartner, as well as in areas with a high smoking prevalence[1]. According to the GATS (Global Adult Tobacco Survey), Indonesia is a country with the highest prevalence of male smokers. GATS data also shows that Indonesia is the country with the highest prevalence of passive smokers at home (78%) and the second highest prevalence of passive smokers in public places (59%)[10]. This can lead to high cervical cancer rates in Indonesia.

METHODS

This research is an observational study. The approach used is retrospective. The association analytic study was carried out with a cross-sectional research design. The data recorded is secondary data in the form of IVA screening medical records for the period January-December 2016.

Data were collected at the KIA unit of Puskesmas Wonoayu. The implementation of medical record data recording in two stages (due to a large number of samples in total sampling), namely on October 19, 2017, and October 26, 2017. The process of recording samples from medical records is done by recording data from medical records on the research questionnaire sheet.

The extracted data was compiled based on a history of daily cigarette smoke exposure (the dependent variable) and IVA screening results (independent variable) in the SPSS application. The distribution of the two variables will be presented in tabular form. Analysis of the relationship between the two variables was carried out using Chi-Square analysis. In the next step, the data is presented in a 2x2 cross-tabulation table, and Prevalence Ratio (RP) is calculated to find out how the two variables relate.

RESULT

The characteristics of the study sample from the 2016 IVA screening medical record are illustrated in the following table.

Table 1 Characteristics of the study sample based on a history of passive smoking

	Freq	%	Valid %	Cumulative %
Valid	55	24,7	24,7	24,7
Not Valid	168	75,3	75,3	100
Total	223	100	100	

Table 1 above shows: 55 women (24.7%) had a history of passive smoking (daily cigarette smoke exposure), and 168 women (75.3%) had no daily cigarette smoke.

Table 2 Characteristics of study samples based on Positive IVA results.

	Freq	%	Valid %	Cumulative %
Valid	55	24,7	24,4	24,7
Not Valid	168	75,3	75,3	100
Total	223	100	100	

Table 2 above shows: 21 women (9.4%) received positive results, and 202 women (90.6%) received negative IVA results.

The results of the correlation test of the two variables are illustrated in the following table.

Table 3 Chi-Square correlation test results

	Value	df	AS two-sided	ES two-sided	ES one-sided
Pearson Chi-Square	4,130[a]	1	0,042		
Continuity Correc-tion[b]	3,120	1	0,077		
Likelihood Ratio		1	0,054		
Fisher's Exact Test				0,060	0,043
Linear-by-Linear Associa-tion	4,111	1	0,043		
n of Valid Cases	223				

a = Zero cells (0,0%) have expected count less than 5. The minimum expected count is 5,18.

b = Computed only for a 2x2 tables

AS = Asymptotic Significance

ES = Exact Sig.

In the Pearson Chi-Square section, the Asymptotic Significance (2-sided) yielded results at 0.042 (p <0.05). These results indicate that there is a relationship between passive smoking with positive IVA results. The following table crosses the tabulation of the two variables and calculation of the value of RP (Prevalence Ratio).

Table 4. Cross Tabulation

	IVA Result		Total
	Positive	**Negative**	
Exposed	9	46	55
Not Exposed	12	156	168
Total	21	202	223

$$RP = \frac{a}{a+b} \Big/ \frac{c}{c+d}$$

$$RP = \frac{9}{9+46} \Big/ \frac{12}{12+156}$$

$$RP = 2.29$$

Where:

a = subjects with risk factors experiencing effects (exposure to secondhand smoke, Positive IVA)

b = subjects with no risk factors (no exposure to cigarette smoke, negative IVA)

c = subjects without risk factors having an impact (not exposed to cigarette smoke, Positive IVA)

d = subjects without risk factors that had no effect (not exposed to cigarette smoke, negative IVA)

Interpretation: The value of the Prevalence Ratio obtained is 2.29 (> 1). Therefore, the variable passive smoking is a risk factor for the team's Positive IVA results.

DISCUSSION

According to Infodatin data published in 2015, in 2013, there were 24.3% of Indonesian people who were active smokers every day. Infodatin data reveal that the prevalence of active smokers is 16 times higher in men than women. According to Tobacco Facts Books, 2.7% of women have a history of active smokers. Among these women, as many as 1.1% of women smoke every day, 0.8% of women sometimes smoke, and another 0.8% are former smokers [11].

Riskesdas 2013 data shows: the number of daily active smokers in villages is higher than in cities. The percentage of active smokers in villages that smoked in their homes, with family members in the vicinity, was also higher in villages compared to cities (87.65% compared to 73.01%). Data from the Book of Tobacco Interest Facts and Its Problems in Indonesia (2012) states that the number of female passive smokers is

two times greater than the number of male passive smokers[12].

Of the 223 study samples, 55 women (24.7%) received daily exposure to cigarette smoke; of these, 21 women (42%) showed positive IVA results.

Statistical analysis showed that the value of $p < 0.05$ (that is, the value of $p = 0.042$). This indicates that there is a relationship between the history of passive smoking with the results of IVA (Acetic Acid Visual Inspection) Positive at the Wonoayu Public Health Center at Sidoarjo.

There are various risk factors associated with cervical cancer; for example, the history of early coitus, multi-partner, multiparity, smoking, and exposure to cigarette smoke. Among these risk factors, cigarette smoke exposure is a risk factor of concern in Indonesia. This is because the number of women exposed to cigarette smoke every day is still very high (GATS, Infodatin, Pusdatin, Riskesdas, and Tobacco Facts). Many health problems arise due to exposure to cigarette smoke, such as low birth weight, cardiovascular disease, airways, and malignancy[13,14,15].

The Tobacco Facts Flower Book states that cervical cancer is a woman's tobacco-related malignancy with the highest morbidity, mortality, and disability rates. The discussion in the next section noted that the number of active smokers in women is low. Therefore, it can be said that high cervical cancer rates, as the highest female malignancy associated with tobacco, are caused by daily exposure to cigarette smoke[16].

In this study, samples with confounding variables (early coitus, multi-partner, multiparity, and active smoking) were excluded. It aims to see cigarette smoke exposure as an independent risk factor.

The results of this study indicate there is a relationship between daily cigarette smoke exposure with positive IVA results. These results are in line with research results published in the Asian Pacific Journal of Cancer Prevention, the Institute of Cytology and Preventive Oncology, WHO, the American College of Obstetricians and Gynecologists, and the ISRN Obstetrics and Gynecology which states the existence of a relationship between a history of cigarette smoke exposure with cervical cancer[17,18,19].

The pathogenesis of cervical cancer due to exposure to passive cigarette smoke has been investigated by Cancer Epidemiology Biomarkers & Prevention and WHO. Cigarette smoke inhaled enters the circulatory system through diffusion in the pulmonary

alveoli capillaries and is distributed to various locations in the body. Cancer Epidemiology Research Biomarkers & Prevention states: nicotine and cotinine are found in the cervical mucus of active and passive smokers. These findings prove that compounds in cigarette smoke can reach the cervix. Both passive cigarette metabolites such as Benzo (a) pyrene diol epoxide and polycyclic aromatic hydrocarbons heterocyclic amine play a role in the pathogenesis of cervical cancer[20,21]. Both metabolites play a role in the process of cervical epithelial cellular immunosuppression (immuno-suppression of cervical Langerhans cells)[22,23]. The immunosuppression process causes persistent HPV infection in the cervix. These persistent infections can cause changes in cervical epithelial cells leading to malignancy. Another opinion put forward by WHO states that the metabolites of polycyclic aromatic hydrocarbons heterocyclic amine cause mutations of cervical epithelial cells leading to malignancy[24,25,26].

REFERENCE

1. Lasut E, Rarung M, Suparman M. Karakteristik penderita kanker serviks di BLU RSUP Prof. DR. R. D. Kandou. Jurnal *e-clinic*. 2015;3(1):83-85.
2. Abdul BS, Djamhoer M. Kesempatan, tantangan, dan harapan untuk masa depan. Dalam: Bunga Rampai Obstetri Dan Ginekologi Sosial. Yayasan Bina Pustaka Sarwono Prawirohardjo.Jakarta. 2005:353-354.
3. Aziz, F. Buku acuan nasional onkologi ginekologi. Jakarta: Yayasan Bina Pustaka Sarwono Prawirohardjo;2010.442-454.
4. Badan Penelitian Dan Pengembangan Kesehatan Kementrian Kesehatan RI. Hasil riskesdas 2013. 2017 [cited 28 April 2017]; 85-87. Available from http://www.depkes.go.id/resources/download/general/Hasil%20Riskesdas%20201 3.pdf
5. World Health Organization. Prevention of cervical cancer through screening using visual inspection with acetic acid (VIA) and treatment with cryotherapy. Geneva: WHO Document Production Services; 2012; 3-6.
6. World Health Organization. WHO guidelines for screening and treatment of precancerous lesions for cervical cancer prevention. Geneva: World Health Organization; 2014; 1-15.
7. Ibrahim A, Aro A, Rask, Pukkala E. Cervical cancer screening in primary health care setting in sudan: a comparative study of visual inspection with acetic acid and pap smear. International Journal of Women's Health. 2012;67- 73.
8. Li, R., Lewkowitz, A.K., Zhao, FH. Analysis of the effectiveness of visual inspection with acetic acid/lugol

iodine in one time and annual follow-up screening In rural china. Arch Gynecol Obstet. 2012; 285(6): 1627-1635.
9. Kementrian Kesehatan RI. Situasi penyakit kanker: deteksi dini kanker leher rahim dan kanker payudara di indonesia 2007 – 2014. Kemenkes RI; 2015; 1- 11.
10. Asma, S., World Health Organization, CDC Foundation, World Lung Foundation, United States, & Centers for Disease Control and Prevention (U.S.). *The GATS atlas: Global adult tobacco survey*. 2015; 50,51,105.
11. TCSC-IAKMI & Kementrian Kesehatan RI. *Bunga rampai fakta tembakau dan permasalahannya di Indonesia*. 2014. Kemenkes RI: 2014; 29, 54, 58-60.
12. TCSC-IAKMI & Kementrian Kesehatan RI. *Bunga rampai fakta tembakau dan permasalahannya di Indonesia*. 2012. Kemenkes RI: 2012; 29, 54, 58-60.
13. Gatcia F, Hatch KD, Berek JS. Intraepithelial disease of the cervix, vagina, and vulva. Berek & Novak's Gynecology. Lippincott Williams & Wilkins.15th ed; 2012; 1048-1097.
14. Tao Zeng X, An Xiong P, Wang F, Yi Li C, Yao J, Guo Y. Passive smoking and cervical cancer risk: a meta-analysis based on 3.230 cases and 2.982 controls. Asian Pacific Journal Of Cancer Prevention. 2012; 13.
15. Agarwal, S. S., Sehgal, A., Sardana, S., Kumar, A., & Luthra, U. K. Role of male behavior in cervical carcinogenesis among women with one lifetime sexual partner. Institute of Cytology and Preventive Onkology. 1993; 1666-1669.
16. Trimble, C. L., & Genkinger, J. M. . Active and passive cigarette smoking and the risk of cervical neoplasia. *American College of Obstetricians and Gynecologyst*. 2005; 1-12.
17. Fonseca-Moutinho J. Smoking and cervical cancer. ISRN Obstetrics and Gynecology. 2011;2011:1-6.
18. Louie K, Castellsague X, de Sanjose S, Herrero R, Meijer C, Shah K et al. Smoking and sassive Smoking in cervical cancer risk: pooled analysis of couples from the IARC multicentric case-control studies. Cancer Epidemiology Biomarkers & Prevention. 2011;20(7):1379-1390.
19. Kementerian Kesehatan RI. Pusat data dan informasi kementerian kesehatan RI stop kanker. Kemenkes RI; 2015; 2-6.
20. Badan Pusat Statistik. Statistik kesehatan 2013. Jakarta: Badan Pusat Statistik. 2014; 220-223.
21. Rasjidi I. Deteksi dini dan pencegahan kanker pada wanita. Jakarta: Sagung Seto; 2009; 97-107.
22. Vedantham, H., Silver, M. I., Kalpana, B., Rekha, C., Karuna, B. P., & Vidyadhari, K. Determinants of VIA (visual inspection of the cervix after acetic acid application) positivity in cervical cancer screening of women in a peri-urban area in andhra pradesh, india. *Cancer Epidemiology Biomarkers & Prevention*. 2010; 19(5): 1373-1380. doi:10.1158/1055-9965.epi-09-1282
23. Gutiérrez-Fragoso, K., Acosta-Mesa, H. G., Cruz-Ramírez, N., & Hernández-Jiménez, R. Optimization of classification strategies of acetowhite temporal patterns towards improving diagnostic performance of colposcopy. *Computational and Mathematical Methods in Medicine. 2017*; 1-10. doi:10.1155/2017/5989105
24. American cancer society guidelines for the early detection of cancer. 2017 [cited 31. April 2017]. Available from: https://www.cancer.org/healthy/find-cancer-early/cancer-screening-

guidelines/american-cancer-society-guidelines-for- the-early-detection-of-cancer.html
25. Benowitz, N. L., Hukkanen, J., & Jacob, P. (n.d.). Nicotine Chemistry, Metabolism, Kinetics and Biomarkers. *Handbook of Experimental Pharmacology*. 2009; 29-60. doi:10.1007/978-3-540-69248-5_2
26. Kementerian Kesehatan RI. Pedoman teknis pengendalian kanker payudara & kanker leher rahim. Kemenkes RI; 2013; 155-217.