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RESEARCH ARTICLE

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Experimental Use of Self Test Endoscopy for Cervical Cancer Screening

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ABSTRACT

Cervical cancer is the fourth deadly cancer that attack women worldwide. Regardless of age, cancer attack all age range, from children to elderly. Cancer prevalence in Indonesia reaches 1.4 per 1000 population. For cervical cancer case, Semarang was one of city in the Province of Central Java which have highest cervical cancer case in 2011. Cases of cervical cancer in Semarang increased from 2,782 in 2010 to 5,155 in 2011. By comparison around the world, Indonesia ranked seventh in the world and the first in Asia. The handling of cancer in Indonesia faces various obstacles that cause nearly 70% of patients found in an advanced stage. Implementation of technology could minimize that condition. In cervical cancer cases, the use of cervical screening program could decrease incidences of cervical cancer. By using cervical screening program, early detection of cervical cancer could be done. Self-test endoscopy is one of the method to detect cervical cancer early. This paper elaborate how self-test endoscopy is used to screen cervical cancer. By using self-test endoscopy, one of seven subject in this experiment detected as cervical cancer subject.

Keywords: Cervical cancer screening; Self-test endoscopy

INTRODUCTION

Background

Cervical cancer is the fourth deadly cancer that attack women worldwide. Some challenges are faced by cervical cancer screening program. The use of cervical screening programs give a lot opportunities to decrease the incidences of cervical cancer. But those are faced with challenges such as lack of physical access to cervical screening facilities, little knowledge about cervical cancer screening and its benefits, low level of self perceived from risk of cervical cancer, lack of inadequate health facilities, long distance of screening facilities, high transportation costs, inadequate training, and incompetence of human resources.^{(1),(2)}

Fast developed technology gives a lot of hope for better quality of health services. In order to develop technology of the future, in this case is early detection of cervical cancer which simple, easy, accurate, and can be utilized from primary services, there is a need to describe how a technology (self-test endoscopy) can be used for cervical screening. This paper explain how self-test endoscopy performed to detect cervical cancer. From the use of this technology, this paper proposed that cervical cancer could be detected early so that death incidences from cervical cancer decrease.

Purpose

This study demonstrated that the use of technology can reduce the incidences of cancer. When dealing with cervical cancer, one of the prevention method is screening. Cancer screening itself utilizes technology. The results

of this study are expected to provide benefits in the advancement of appropriate technology in cervical cancer screening. One of early detection method by using technology when handling cervical cancer is the use of self-test endoscopy. Through the use of self-test endoscopy, it is hoped that this study provides an illustration that early detection of cervical cancer can be carried out.

METHODS

This study was carried out in the form of an experiment. The experiment conducted at IBL Semarang Laboratory and then processed in Biomedical Electronic Laboratory. There are 7 respondents which are participated in the experiment. Those respondent belong to two criteria: normal subject and positive cervical cancer subject. The subject then examined whether they have cervical cancer or not by using self-test endoscopy. During the experiment, data of cervical image of the subject collected. Beside cervical image, there are others information about the subject that collected such as age, health history, menstruation period, etc. Cervical images of the subject then analysed and diagnosed. The diagnosis result then become information whether subject is belong to normal or positive cervical cancer criteria.

RESULTS

The study was conducted at the IBL Clinics Laboratory in Semarang City at April 2018. In that laboratory, datas are collected using method namely papsmear examination and cervical pictures have been taken using self-test endoscopy. The type of self-test Endoscopy used is (1) the Supereyes Digital Endoscope model Y002 and (2) Supereyes model B003+. The results of papsmear examination is carried out using conventional processes. Classification of general categories such as negative intraepithelial lesions, papanicolau class normal, inflamed, and malignant using papsmear examination are showed in Table 1. From Table 1 subject with cervical cancer criteria could be detected. By comparison, the cervical mouth image of negative intraepithelial lesions, papanicolau class normal, inflamed, and malignant categories using self-test endoscopy showed in Table 2. There are connection whether respondent detected as cervical cancer subject from image in self-tes endoscopy and papsmear examination result. One of the connection is the pattern of cervical mouth, the cervical cancer criteria have dark and blooded pattern than the normal one. From those observation, image data also processed in Biomedical Electronic Laboratory to obtained the detection process algorithm using image processing to determine the state of the normal cervix or cervical cancer.


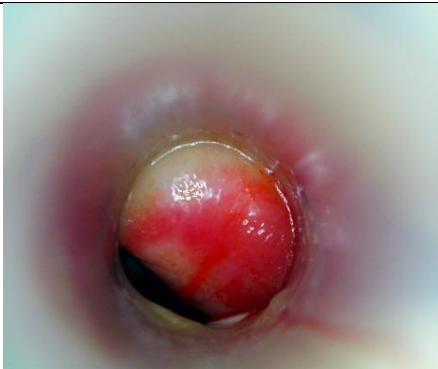


Figure 1: self-test Endoscope: (1) Supereyes B003+ model and (2) Digital Endoscope Supereyes model Y002

Table 1. Results of pap smear data collection and biopsy

Respondents	Cervical Cytology Examination Results	Information
6	<ul style="list-style-type: none"> Sample Process: Conventional General Category: Negative intraepithelial lesions Papanicolaou class: II Inflammation Other non-neoplastic: reactive changes in inflammatory reactions Conclusion: negative intraepithelial lesions and negative malignancies. Reactive changes due to non-specific inflammation / inflammation (Class II) 	Normal cervix
7	<p>How to take a biopsy. Histology result of surgery:</p> <ul style="list-style-type: none"> Histology of surgery: preparation in the form of ± 0.5 CC tissue pieces, white color, elastic consistency. Microscopic shows: groups of pleimorphic epithelial cells, coarse-chained nuclei, accompanied by mitosis and individual keratinization, appear to infiltrate into the stroma In accordance with squamous cell carcinomas moderately differentiated. Malignant diagnosis of neoplasm of cervical uterus. Malignant. 	Cervical cancer

Table 2. Image results from self-test endoscopy

Respondents	Self-test endoscopy results	Information
6		Normal cervix. Retrieval Using self-test Endoscopy (2). distance of 2 cm from the cervix.
7		Cervical cancer. Taking self-test Endoscopy (2) 2.5 cm distance from the cervix.

DISCUSSION

Cervical cancer are the most common cancer that attacks women in developing countries. Cervical cancer also belong to malignant types so there is a need to detect them early for prevention. One of prevention method is the use of self-test endoscopy. This technology can be used to detect cervical cancer if the endoscopy image is good enough. The use of cytology tests developed by George Papanicolaou (pap smear) in cervical cancer screening programs has led to a reduction in the incidence of cervical cancer in developing countries, but 70% of patients found to be in an advanced stage so that prevention services are very important to reduce the morbidity and mortality caused by cancer⁽³⁾⁽⁴⁾. By using self-test endoscopy as one of prevention services, early detection could be carried out.

Data collection has been done to 7 respondent. Based on the results of the pap smear diagnosis and cervical image of the respondents, it can be stated that 6 subject were normal criteria and 1 subject tested as positive for cervical cancer criteria. Image processing from those cervical image could be developed in the future to detect cervical cancer. There is a provision need before taking a cervical image in order to get better image. In the process of taking cervical image, the respondent's response has no specific complaints.

CONCLUSION

Data collection has been done to 7 respondent. Based on the results of the pap smear diagnosis and cervical image of the respondents, it can be stated that 6 subject were normal criteria and 1 subject tested as positive for cervical cancer criteria. Endoscopic image collection must be done well so that: the image clean from vaginal discharg, the cervix located in the middle, and initial brightness of the image is uniform.

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