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ORIGINAL ARTICLE

Screening of cervical cancer using Smart scope at a Rural Health Training Centre, Pune, India: A cross-sectional study

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Abstract

Objective: To screen women for cervical cancer using Smart scope at a Rural Health Training Center, Pune, India.

Methods: The present study analyzed available screening data using a cross-sectional design. A private medical college's rural health training center provides screening services to women above 30 years of age as per the Government of India's guidelines. The guidelines include visual inspection after applying acetic acid (VIA). The study included data from June 2019 to January 2020, when a principal investigator was posted in a rural health training center. The study participants were married women. We screened all women giving consent. The authors used a Smart scope (image capturing and transmitting device), Cusco's speculum, and acetic acid. The images were immediately transmitted to faculty from the Obstetrics and Gynecology department for prompt opinion.

Results: Out of 1,232 women, 179 consented. The mean age was 37.7 years. (SD=8.62). Eighty-three women showed cervical pathologies, and 14 were VIA positive. The majority of the women had vaginal discharge. The most common pathological lesion was cervical erosion (32.12%). The study found no association between age and parity with cervical pathological findings.

Conclusion: Smart scope helps prompt diagnosis of the condition of the cervix. Visualizing the photo of cervical pathology by the women enhances the patient's health care seeking. It is a feasible and cost-effective process that overcomes the limitations of VIA.

Keywords: Cervical Screening, Smart Scope, Cervical Cancer, Cervical Pathologies

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INTRODUCTION

Cervical cancer is an important cause of mortality among women and is an increasing health problem across the globe. Worldwide, cervical cancer is the fourth most frequent cancer in women with an estimated 660,000 new cases and 350,000 deaths in 2022. Out of total deaths 94% occur in low- and middle-income countries.[1] In developed countries the incidence has decreased after using Papanicolaou smear (Pap smear). [2]

Cervical cancer ranks as the 2nd most frequent cancer among women in India and third number among causes of cancer deaths. About 5.0% of women in the general population are estimated to harbor cervical HPV-16/18 infection at a given time, and 83.2% of invasive cervical cancers are attributed to HPVs 16 or 18. [3]

There is a difference in the incidence of cervical cancer in developing and developed countries. This is because of the better screening facility and knowledge in the developed countries due to which the cases have been significantly reduced while the developing countries like India, which lacks the screening facility and knowledge, the burden of cervical cancer is still high. According to the World Cancer statistics, >80% of all cervical cancer cases are found in developing and low-income countries, because of a lack of awareness and difficulty in running cytology-based screening programs.[4] India's National Cancer Control Program emphasizes the importance of early detection and treatment, but the country has no organized screening program, and many Indian women lack both awareness about the disease and access to prevention and treatment facilities.[5] Even if women from rural settings can reach distant clinics to get their Pap smear, the test takes four to five days to be processed. As a result, many women do not return for follow-up because they cannot afford to take another day off from work.[6] In India, the guidelines for community-based cervical screening programs based on visual inspection by acetic acid (VIA) were formulated in the year 2005.[7] Sensitivity and specificity of VIA were reported to be in the range of 67% to 79% and 49% to 86% respectively and those for Visual Inspection after Lugol Iodine were 77.8% to 98%, and 73% to 91.3%, respectively.[8] Government of India has advised screening of all women above 30 years using VIA. However, visual screening tests have limitations like extreme subjectivity in interpreting tests, lack of permanent records, low reproducibility, overestimation, and overtreatment.[9] Hence telemedicine (image transmission) component was started in Rural Health Training Center. With the help of Smart scope and visual inspection by VIA pathological assessment can be conducted. It saves images that may be transmitted for the opinion of gynecologists.[10] Early detection and appropriate treatment are possible if robust screening is implemented. Therefore, the use of Smart scope in the rural area serves the purpose of screening cervical pathology as the process is easy, feasible, and cost-effective. Smart scope aids in visual screening methods for the detection of various cervical lesions. This study aimed at the Screening of cervical cancer using Smart scope at a Rural Health Training Centre, Pune, India.

Objectives

To identify the types of cervical pathologies using Smart scope

To estimate the prevalence of cervical pathologies

To assess the association of age with cervical pathologies

To assess the association of parity with cervical pathologies

METHODS

It was a cross-sectional study conducted in the rural field practice area of a private medical college in 2019-20. Field practice area of the center consists of 23 villages having a population of about 52,000. The population and services are comparable to a primary health center. Study participants were women, attending the outpatient department. The inclusion criteria were any woman above the age of 18 years, married and who were sexually active. The exclusion criteria were woman having diagnoses cancer cervix or history of treatment of cervical cancer. All women fulfilling the inclusion and exclusion criteria and agreeing to the cervical screening were included. They were counseled first before actual the screening test. Research tools used for detection of cervical pathologies were a Smart scope (A probe with the camera, tablet, and internet connection), Cusco's speculum, and Acetic acid. Apart from the device, disposables and cleaning agent is required for smooth functioning. The total cost per year was about $4,000. The cost It facilitates close examination and magnified visualization of the cervix thereby enables identification of abnormalities or precancerous changes at an early stage. It helps keep track of the cervical health of an individual patient over many years.[11] The females coming to general outpatient department (OPD) or outreach camps of Rural Health and Training Center, of a private Medical College were counselled to go for cervical screening. Consent was taken from the study participant before the examination. After taking the consent, females were examined maintaining full privacy. The vagina and cervix were examined with the help of Cusco's speculum and Smart scope. The photographs were clicked. Then visual inspection was done after one minute of application of 5% acetic acid and again we took photographs.

The photographs from the tab were taken post application of 5% acetic acid. The images were also shown to women. The photographs were immediately sent by the app to the senior faculty of the Obstetrics and Gynecology Department of the Medical College Hospital. If any pre-cancerous lesions/cancer/ any pathology was suspected by the specialist, then the participants were referred for further investigations. The pictures of cervical pathologies were shown to the participant women. Data were entered into an excel sheet and analyzed using SPSS version 28. The authors applied one-way ANOVA test to assess significance between means.

RESULTS

We counseled 1232 women; only 179 consented and had undergone cervical screening. The mean age of screened women was 37.7 years (SD=8.62). The mean parity was 2.34. Most of the women attended OPD as they were having some symptoms. Many women complained having more than one symptom. Figure 1 gives the proportion of women having symptoms. Majority women had vaginal discharge. Only five percent women came for routine check-up. Many women were having multiple symptoms.

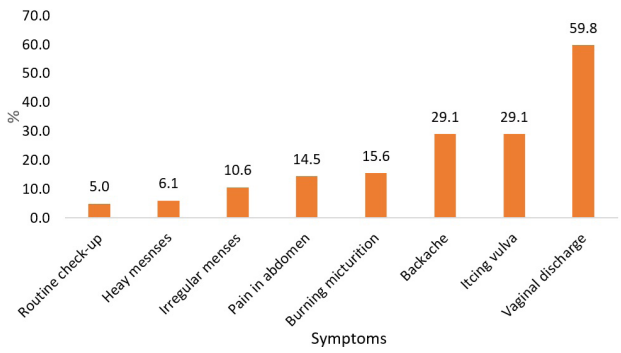

Figure 1. Distribution of women according to symptoms

Figure 2 gives details of women enrolled, consented for screening, VIA and cervical pathologies confirmed by Smart scope.

The majority of the women i.e. 53.63% displayed healthy cervix. Commonest pathological lesion was cervical erosion (32.12%). Table 1 provides information about all pathologies observed as well association of age and parity according to the cervical pathology.

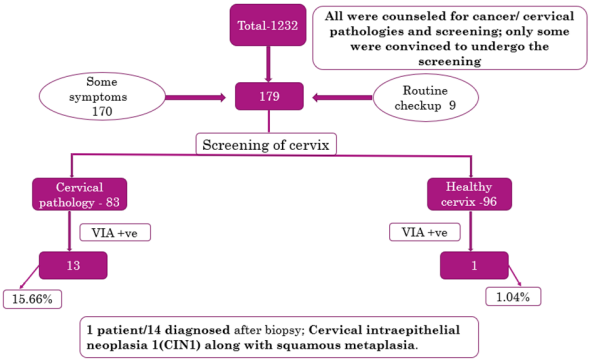

Figure 2. Classification of visual inspection after acetic acid application

Table 1. Association of age and parity with cervical pathologies

Pathology	Frequency(%)	Mean age (SD)	Mean parity (SD)
Healthy	96 (53.6)	38.50 (9.3)	2.33 (0.1)
Erosion	62 (34.6)	37.27 (7.2)	2.37 (0.1)
Mixed infection	15 (8.4)	38.57 (6.6)	2.17 (0.2)
Polyp	6 (3.4)	41.33 (6.8)	2.67 (0.5)
Total	179	37.77 (8.6)	2.34 (0.5)
		p=0.57	p=0.77

The examples of the typical appearance and clarity of transferred images of cervix and which were shown to the participants are shown in Figure 3.

Figure 3. Images of cervical pathologies

DISCUSSION

In the present study after counseling 1232 females, very few women agreed upon the screening of cervical cancer. Alyse et al. observed that only 14.3% participants had at least one-lifetime pelvic exam and 7.1% had undergone cervical screening.[12] The less acceptance for screening has origin in lack of knowledge about cancer cervix and screening procedure. Married young women from a higher socioeconomic status were more likely to be screened. Concerning knowledge of cervical cancer, 84.6% of women had poor knowledge, 10.3% had moderate knowledge, and 5.1% had good knowledge.[12] Charity Binka et al. also mentioned in their study that low level of knowledge about the disease and screening services, personal or psychological convictions, and cost of screening and treatment coupled

with a low level of income were the barriers at the individual level.[13] A number of studies have come out with similar findings. For instance, it was established that in the low and middle-income countries, especially in rural areas, knowledge and awareness of cervical cancer screening are very low, and this is one of the main factors that constrain women's uptake of cervical cancer screening initiatives.[14-16] In the present study maximum women presented with vaginal discharge as one of the symptoms. Similar findings were revealed by Magdi et. al.[17] Amos et al. observed in their study that the majority of participants attributed initial symptoms of vaginal discharge and itching to Sexually Transmitted Diseases including syphilis and/or gonorrhea.[18] A study conducted on diagnosis and management of cancer of cervix presented abnormal vaginal bleeding, vaginal discharge and lower abdominal pain as the most common first symptoms reported by participants.19 A study conducted on diagnosis and management of cancer of cervix presented abnormal vaginal bleeding, vaginal discharge and lower abdominal pain as the most common first symptoms reported by participants.[19] A study conducted in population of Goa among women aged 18-50 years, observed that 53% of their study population were found to have infections causing their discharges, the figure is considerably higher than the 14.5%.[20]particularly among women in Asia. Although presumed to be caused by reproductive tract infections (RTIs Present study showed that there is no association of age and parity with cervical outcomes. The results are supported by another study by Acharya et al. who mentioned that age, parity, perceived susceptibility, perceived benefits, and perceived barriers had no significant association with cervical cancer whereas, in contrast.[21] A study by Nubia et al. found a direct association between the number of full-term pregnancies and squamous-cell cancer risk: the odds ratio for seven full-term pregnancies or more was 3·8 (95% Cl 2·7–5·5) compared with nulliparous women, and 2·3 (1·6–3·2) compared with women who had one or two full-term pregnancies. There was no significant association between the risk of adenocarcinoma or adeno-squamous carcinoma and the number of full-term pregnancies.[22] A comparative study between age and parity with cervical cancer reported that there is no relation between squamous intraepithelial lesions incidence and increasing age but a correlation with increasing parity. There is the rise in squamous intraepithelial lesions incidence was seen with increasing parity in adult women between 21-40 years.[23] Multiparity as risk factor of cervical cancer has also been stressed in their rural findings by Rajput et al, Das Gupta et al. [24,25] Green et al. in their study have correlated early age at the first sexual intercourse and subsequent child birth with risk of carcinoma cervix.[26] The greatest advantage of the study was the participant women seen photos of their cervical lesion which improve their compliance to referral. In some areas of outreach camps including our institution, the real-time transmission was not possible due to poor connectivity.

CONCLUSION

The study concluded that the positivity among symptomatic was about 16% whereas, among non-symptomatic, it was about 1 %, indicating mandatory screening among symptomatic. The use of Smart scope may play a promising role in combating all the barriers and help in detection of the condition

of the cervix, providing prompt diagnosis and advice to the patient. With marginal one time increase in resources; it can be used by private practitioners and health centers.

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