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ORIGINAL RESEARCH

A Prospective Study to Evaluate the PAPSmear and Acetic Acid Test (VIA) as Cervical Cancer Screening Tools with Histopathological Correlation at Tertiary Care Center

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ABSTRACT

Background: Cervical cancer is the second most common cancer among women globally. There are different methods for control and prevention of cervical cancer which include conventional cytology (Pap smear), liquid-based cytology, human papillomavirus (HPV) screening, and vaccination against HPV. The aim of this study to evaluate the pap smear and acetic acid test as cervical cancer screening tools with histopathological correlation.

Material & Methods: The present study was carried out in department of pathology at SMS Medical College, Jaipur, Rajasthan, India for one year period. A total of 150 patients attending the gynecology OPD were enrolled in the study. All the patients in the study were subjected to colposcopy. The cervix was inspected with the naked eye than with a colposcope. After taking the Pap smear with Ayre's spatula and cytobrush and was evaluated by the Bethesda system and then cervix was washed with normal saline and visualized, followed by application of 3% acetic acid and visualization by colposcope. Collected data was statistically analyzed to determine specificity and sensitivity, PPV, NPV of Pap smear, VIA.

Results: Our study shows that majority of cases were seen in 40-50 years of age group.Sensitivity of VIA was found to be 90% (versus Pap smear, which had 40%) and specificity of VIA was 87.85% (versus Pap smear, which had specificity of 96.42%).

Conclusion: PAP smear screening needs good infrastructure, trained manpower to make & interpret the slides which is not feasible considering the facilities available in the periphery. However, VIA can be done even by sisters in the remotest place with minimum facilities & patient is diagnosed.

Keywords: Cervical Cancer, PAP Smear, VIA, Histopathology.

INTRODUCTION

Cervical cancer is one of the leading causes of death for middle-aged women in the developing world, yet it is almost completely preventable if precancerous lesions are identified and treated in a timely manner. Cervical cancer is the third most common cancer in women, and the seventh overall, with an estimated 530 000 new cases in 2008. More than 85% of the global burden of cervical cancer occurs in developing countries, where it accounts

for 13% of all female cancers.[1]India alone accounts for one-fourth of the global cervical cancer burden.

Cancer cervix has been considered preventable because it has a long preinvasive state and availability of screening programs and treatment of preinvasive lesions is effective. It has been well established that well-organized screening by cytology has substantially reduced the incidence of morbidity and mortality from cervical cancer in developed countries.[2,3]

There are different methods for control and prevention of cervical cancer which include conventional cytology (Pap smear), liquid-based cytology, human papillomavirus (HPV) screening, and vaccination against HPV.

Many developing countries do not have ample resources to implement cytology-based prevention programs, which necessitates well-organized laboratories to collects material and specialized personnel apt to render a diagnosis.[4] Interpretation of cytology is difficult as cytologists are not easily available in periphery. Moreover, patient's need to come to collect report may lead to loss of the patient for follow-up. Hence other methods of early detection of cervical neoplasm, particularly those based on visual inspection are being investigated.

Newer approaches such as automated Pap, liquid-based Pap and HPV DNA testing using hybrid capture II (HC II) are time consuming, expensive and not widely available. Prompted by the need for optimal strategies for cervical cancer screening in low-resource settings, the role of visual inspection with acetic acid (VIA) and visual inspection with Lugol's iodine (VILI) has been widely studied in several recent studies, which suggest that VIA and VILI closely match the Pap smear in its performance in detecting cervical cancer precursor.[5] A simple low-cost technique screening test, namely visual inspection with acetic acid (VIA), which is based on the ability of the trained health care personnel to detect acetowhite in the cervical transformation zone, is currently being evaluated in the experimental setting as a potential alternative to cervical cytology. The aim of this study to evaluated the pap smear and acetic acid test as cervical cancer screening tools with histopathological correlation.

MATERIALS & METHODS

The present study was carried out in department of pathology at SMS Medical College, Jaipur, Rajasthan, India for one year period. A total of 150 patients attending the gynecology OPD were enrolled in the study. Patients to be screened were explained the procedure to be performed, written informed consent was taken and the relevant obstetrical and gynecological history was also taken, with the patient being reassured that the procedure was painless.

INCLUSION CRITERIA

Patients in the age group of 18-60 years were included in the study and priority was given to patients with the following risk factors:

- Early marriage.
- Early pregnancy (teenage pregnancy).
- Sexual activity at early age.
- Multiparity.
- Multiple sexual partners.
- Women with STI, leukorrhea, abnormal vaginal bleeding.

EXCLUSION CRITERIA

- Unmarried patients.
- Patients below 18 years and above 60 years.
- Patients with bleeding P/V and active infection at the time of examination.
- Women with frank invasive cervical cancer.

METHODS

All the patients in the study were subjected to colposcopy. The cervix was inspected with the naked eye than with a colposcope. After taking the Pap smear with Ayre's spatula and cytobrush and was evaluated by the Bethesda system and then cervix was washed with normal saline and visualized, followed by application of 3% acetic acid and visualization by colposcope. All the tests were performed by trained residents and faculty who did not know the aims and objective of the study and was also done separately by different residents/faculty. Biopsy was done for confirmation of lesion if either of the three screening tests or colposcopy had a positive finding or if the Pap smear reported ASCUS, for confirmation of lesion. Collected data was statistically analyzed to determine specificity and sensitivity, PPV, NPV of Pap smear, VIA.

RESULTS

In our study, 14% of the cases were in the age group of 18-30 years, 34% in the age group of 30-40 years, 36% in the age group of 40-50 years and 16% in the age group of more than 50 years (table 1).

Table 1: Distribution of patients according to age groups

Age (years)	No. of patients (N=150)	Percentage
18-30yrs	21	14%
30-40yrs	51	34%
40-50yrs	54	36%
>50 yrs	24	16%

Positive results obtained from Pap were 7.33% (11). Sensitivity of Pap smear was found to 60% compared to specificity which was 96.42%.This was attributed to high number false negative smear (table 2 & 3).

Table 2: association between cervical biopsy report with the result of PAP SMEAR test

Cervical biopsy report / Pap smear test	Positive	Negative	Total	P-value
Positive	6	5	11	<0.05*
Negative	4	135	139	
Total	10	140	150	

Table 3: sensitivity and specificity of PAP SMEAR with cervical biopsy report Interpretation-it has been found that there is significant association between the histopathology report and PAP SMEAR report (as *P*<0.05)

Variables	Value
Sensitivity	60%
Specificity	96.42%
Positive predictive value	54.54%
Negative predictive value	97.12%
% of false positive value	3.58%
% of false negative value	40%
Accuracy	94%

VIA was positive in 26 women out of 150 cases. Sensitivity of VIA was found to be 90% compared to specificity, which was 87.85%. Sensitivity of VIA was found to be 90% (versus Pap smear, which had 40%)and specificity of VIA was 87.85% (versus Pap smear, which had specificity of 96.42%) (table 4 & 5).

Table 4: association between cervical biopsy report with the result of VIA

Cervical biopsy report / VIA	Positive	Negative	Total	P-value
Positive	9	17	26	<0.05*
Negative	1	123	124	
Total	10	140	150	

Table 5: sensitivity and specificity of VIA with cervical biopsy report Interpretation-it has been found that there is significant association between the histopathology report and VIA (as *P*<0.05)

Variables	Value
Sensitivity	90%
Specificity	87.85%
Positive predictive value	34.61%
Negative predictive value	99.19%
% of false positive value	12.15%
% of false negative value	10%
Accuracy	88%

DISCUSSION

Cervical cancer is the second most common cancer among women globally. Invasive cervical cancer is preceded by a long phase of precancerous lesion that can be detected by screening and treated effectively by simple treatment, which can prevent invasive cancer. Our study shows that majority of cases were seen in 40-50 years of age group, which was compatible with Juneja A et al.[6]found more than 40 years of age group.

In this study positive results obtained from Pap were 7.33% (11). Sensitivity of Pap smear was found to 60% compared to specificity which was 96.42%.This was attributed to high number false negative smear. Similar results compatible, with P. Gosh, et al[7] found sensitivity was 52.6% & specificity was 99%. A similar study done by Basu PS and Sankarnararayanan[8] and Shuchi consul et al[9] found sensitivity was 29.5% & 84.2% respectively and specificity was 92.3% & 62.1% respectively.

Sensitivity of VIA was found to be 90% compared to specificity, which was 87.85% in our study. Similar results compatible, with P. Gosh, et al[7] found sensitivity was 89.5% & specificity was 91.2%. A similar study done by Shuchi consul et al[9] found sensitivity was 84.2% and specificity was 55.2%.

In present study found sensitivity of VIA was found to be 90% (versus Pap smear, which had 40%) and specificity of VIA was 87.85% (versus Pap smear, which had specificity of 96.42%). Thus, VIA showed higher sensitivity compared to Pap smear, whereas VIA had lower specificity compared to Pap smear. Lower specificity of VIA when compared to Pap smear was due to the high incidence of suspected acetowhite epithelium, which might be inflammation, immature metaplasia or latent HPV infection. Accuracy of VIA is 88% compared to 94% in Pap smear.

This high incidence of cervical cancer may be attributed to the lack of awareness among the masses as well as even in some of the doctors working in the periphery. The lack of effective screening program leads to reporting of very advanced cases of cervical cancer cervix where mortality and morbidity is very high.

CONCLUSION

PAP smear screening needs good infrastructure, trained manpower to make & interpret the slides which is not feasible considering the facilities available in the periphery. However,VIA

can be done even by sisters in the remotest place with minimum facilities & patient is diagnosed.So patient compliance is also better. The VIA is accurate screening test and suitable alternative to PAP smear.

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