ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Evaluation of Pap Smear and Acetic Acid Test As Cervical Cancer Screening Tools -With Histopathological Correlation.

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ABSTRACT

To evaluate the efficacy of Pap smear and acetic acid test in cervical cancer screening. Seventy women with complaints of white discharge per vagina, pelvic pain and post coital bleeding were included. Pelvic examination followed by Pap smear and acetic acid test were performed. The results were correlated with histopathological diagnosis. The sensitivity of acetic acid (88.37%) was higher than that of Pap smear (69.77%). The specificity of Pap smear was 88.89% and that of acetic acid test was 55.60%. The overall diagnostic accuracy by Pap smear was 77.14% and that by acetic acid test was 75.10%. Papanicolaou test is widely used as a screening test for carcinoma cervix. Acetic acid test may be used as an alternative to cervical cytology owing to its lowcost and immediate availability of results. However, the lower specificity of acetic acid test may lead to over treatment of non-neoplastic lesions if 'see and treat' policy is used.

Keywords: Carcinoma cervix, Acetic acid test, Pap smear, Low grade squamous intraepithelial lesion (LSIL), High grade squamous intraepithelial lesion(HSIL), Squamous cell carcinoma(SCC)

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ISSN: 0975-8585

INTRODUCTION

Cancer of the uterine cervix is one of the leading malignancies seen in Indian women[1]. The incidence is higher in developing countries due to lack of effective screening programmes[2]. No form of cancer documents the remarkable effects of screening, early diagnosis and treatment on the mortality rate in a better way than does carcinoma cervix. The decline in mortality and increase in the detection frequency of early cancer and pre-cancerous lesions is due to the effectiveness of Pap test in detecting cervical cancers and the accessibility of the cervix to colposcopy and biopsy[3]. Papanicolaou smear is a simple, safe, non-invasive screening method for detection of lesions in cervix and vagina. The use of acetic acid during visual examination of the cervix, termed visual inspection with acetic acid (VIA) has been tried as an alternative screening method in low resource settings. VIA is a simple, cost effective test which allows real time screening of results[4]. The present study aimsto compare the efficacy of Pap smear and acetic acid test as screening tools of carcinoma cervix.

MATERIALS AND METHODS

Approval for the study was taken from the institutional ethical committee and seventy women in the age group of 20 to 50 years who attended the Gynaecology outpatient department complaints of white discharge per vagina, pelvic pain and post coital bleeding were included in the study. Diagnosed cases of cervical cancer, women who had undergone subtotal hystercectomy or treatment for cervical pre-cancer or cancer, women with visible growth on cervix and pregnant women were excluded from the study.

After taking the informed consent from the patients, the relevant clinical history was elicited and a general physical examination was done followed by per speculum examination. Cervical smears were collected with Ayre's spatula by scraping all around the cervix including the entire transformation zone. The material was then transferred on to glass slides and immediately fixed with 95% alcohol for 30 minutes. Next, a cotton tipped applicator soaked in freshly prepared 5% acetic acid was applied all over the transformation zone and left in situ for 2 minutes[5].

The test results were catergorized as VIA positive and VIA negative. VIA was reported positive if well defined, opaque, acetowhite lesion close to the squamo-columnar junction was observed. VIA was reported negative if there were no acetowhite lesions or if faint lesions were seen. The Pap smear slides were reported according to The Bethesda System 2001. LSIL or worse lesions were considered as positive. Inflammatory smears and atypical squamous cells of undetermined significance were considered as negative.

Cervical cytology and VIA results were correlated with histopathological findings. The two screening tests were compared in terms of sensitivity, specificity, positive predictive value, negative predictive value and accuracy. Data was analyzed using SPSS software.

RESULT

The mean age of the population in the study group was 35.7 years. The major presenting complaints were white discharge per vagina in 77.14%, pelvic pain (11.43%). On cytology, Pap smear was positive in 33 cases (47.14%) out of which 23 cases (32.85%) were diagnosed as low grade squamous intraepithelial lesions and nine cases (12.85%) a high grade squamous intraepithelial lesions and one case (1.42%) as squamous cell carcinoma (Table 1).

TABLE 1: SPECTRUM OF CERVICAL LESIONS BASED ON CYTOLOGICAL STUDY

SL. NO.	LESION	NUMBER OF CASES	PERCENTAGE
1.	NILM	29	41.42
2.	ASCUS	08	11.42
3.	LSIL	23	32.85
4.	HSIL	09	12.85
5.	SCC	01	1.42
	TOTAL	70	100

ISSN: 0975-8585

In the present study, 20 out of 28 cases of CIN I were correctly diagnosed as LSIL on cytology. Seven out of nine cases of CIN II and two out of five cases of CIN III were correctly diagnosed as HSIL on cytology. One case was diagnosed as squamous cell carcinoma (SCC) on both cytology and histopathology (Table 2) (Figure 1-3).

TABLE 2: COMPARISON OF CYTOLOGIC DIAGNOSIS WITH HISTOPATHOLOGICAL DIAGNOSIS

SL. NO.	CYTOLOGY	HISTOPATHOLOGICAL DIAGNOSIS					TOTAL
		CHRONIC CERVICITIS	CIN I	CIN II	CIN III	SCC	
1.	NILM	17	07	02	03	-	29
2.	ASCUS	07	01	-	-	-	08
3.	LSIL	03	20	-	-	-	23
4.	HSIL	-	-	07	02	-	09
5.	SCC	-	-	-	-	01	01
	TOTAL	27	28	09	05	01	70

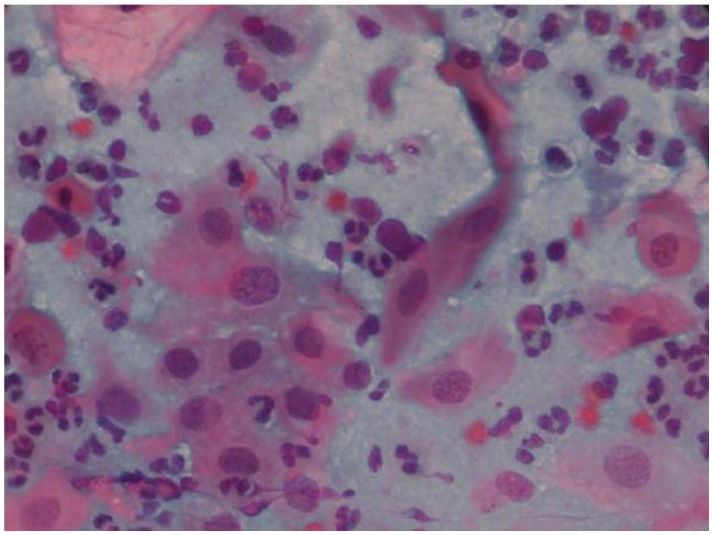

Figure 1: LSIL – CERVICAL CYTOLOGY. Dyskaryotic cells with enlarged nucleus, slightly irregular nuclear contours and uniform chromatin. Pap- X1000

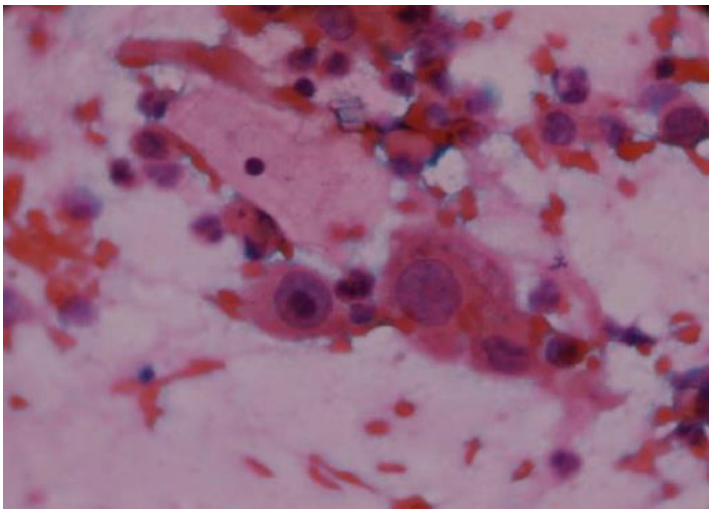

Figure 2: HSIL- CERVICAL CYTOLOGY. Marked increase in nucleo-cytoplasmic ratio, coarse granular chromatin, irregular nuclear contour seen. Some have prominent nucleoli. Pap X1000

ISSN: 0975-8585

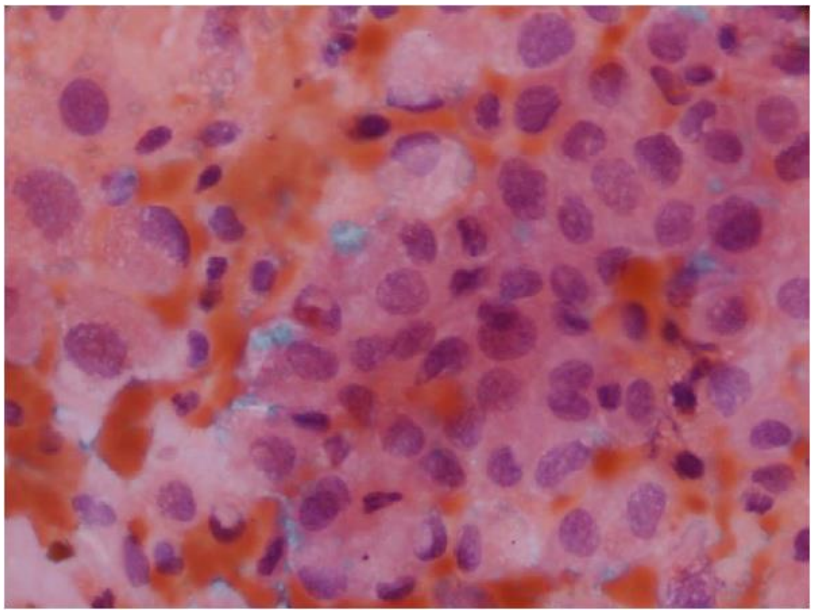

Figure 3: SCC- CERVICAL CYTOLOGY. Marked nuclear pleomorphism with coarse nuclear chromatin. Pap X1000

VIA was positive in 38 out of 43 true positive cases. (Table 3)(Figure 4).

TABLE 3: COMPARISON OF VIA WITH BIOPSY EXAMINATION

		BIOPSY		TOTAL
		+	-	
VIA	+	38	12	50
	-	05	15	20
	TOTAL	43	27	70

Figure 4: POSITIVE ACETIC ACID TEST, Dense acetowhite area seen.

ISSN: 0975-8585

The sensitivity of VIA (88.37%) was higher than that of Pap smear (69.77%). The specificity of VIA (55.60%) was lower as compared to Pap smear(88.89%). The positive predictive value of Pap smear and VIA were 90.91% and 76% respectively. The negative predictive values of Pap smear and VIA were 64.86 and 75% respectively. The diagnostic accuracy of VIA was 75.1% which was comparable to that of Pap smear (77.14%) (Table 4).

TABLE 4: COMPARISON OF VARIOUS PARAMETERS OF PAP SMEAR AND VIA

PARAMETER	PAP SMEAR	VIA
Sensitivity	69.77%	88.37%
Specificity	88.89%	55.60%
Positive predictive value	90.91%	76.0%
Negative predictive value	64.86%	75.0%
Diagnostic accuracy	77.14%	75.1%

DISCUSSION

The mean age in the present study was 35.7 years which was comparable to the study done by Cronje HS in which the mean age was 34.4 years [6]. White discharge per vagina was the most common presenting complaint. Similar clinical presentation was reported by Sara R and Thapa M in their study [7]. Divya Hegde et al also reported white discharge per vagina as the most common presenting complaint in cancerous and pre-cancerous lesions [4]. The sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of both the screening tests in the present study were comparable to the results in the study done by Vahedra et al [8]. (Table 5). The lower sensitivity of Pap smear as compared to VIA in the present study could be due to sampling error and reduced specimen adequacy owing to the conventional preparation. Fluid based, thin layer processing of cervical samples may improve the sensitivity of Pap smear.

TABLE 5: DIAGNOSTIC VALUES OF VIA AND PAP SMEAR

STUDY	SCEENING TEST	SENSITIVITY	SPECIFICITY	POSITIVE PREDICTIVE VALUE	NEGATIVE PREDICTIVE VALUE	DIAGNOSTIC ACCURACY
Vadehra K et al	VIA	96.4%	37.5%	73%	85.7%	75%
	PAP SMEAR	71.4%	56.3%	71.4%	52.9%	65.9%
Present study	VIA	88.37%	55.6%	76%	75%	75.1%
	PAP SMEAR	69.77%	88.89%	90.91%	64.86%	77.4%

In the study conducted by Parul Garg, the sensitivity and specificity of VIA are high [9]. The sample size was larger than in the current study. Other factors affecting the performance of VIA are light source and training and experience of the observer. Usefulness of VIA may be limited sometimes if there is false positive interpretation of VIA in presence of infection, inflammation and squamous metaplasia as these conditions may exhibit acetowhite areas.

CONCLUSION

Cervical cancer is a major health problem of women in developing countries. Pap smear is widely used as a screening tool for cervical cancer. Acetic acid test may be considered as an alternative to Pap smear in poor resource settings where maintaining the quality of cytology based screening programme is difficult. The high sensitivity of VIA is offset by its low specificity and high false positive rates. However, VIA may be useful as an adjunct to improve the sensitivity of cervical cytology.

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