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Research Article

## To study the role of visual inspection of cervix with acetic acid (VIA) in cervical cancer screening

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### ABSTRACT

**Background:** Objectives of current study were to evaluate visual inspection of cervix with acetic acid in picking up abnormal cervix and to correlate the findings of VIA with Pap smear, colposcopy and cervical biopsy.

**Methods:** Study was conducted on 300 sexually active women attending the gynaecological OPD at Dayanand medical college and hospital, Ludhiana. All patients underwent VIA & Pap smear screening and if either of the two was abnormal, colposcopy was done & colposcopic guided cervical biopsy was taken if indicated. Total 105 colposcopies were done. Cervical biopsy was taken in 87 cases and the results were compared and statistically analysed.

**Results:** The sensitivity of VIA was 86% and specificity 40.50%. No case was missed by VIA when cut off was taken as moderate dysplasia or higher lesions on biopsy.

**Conclusions:** VIA is a sensitive, practical and a low cost affair in cervical cancer screening.

**Keywords:** Cervical biopsy, Cervical cytology, Colposcopy, VIA

### INTRODUCTION

Cancer of the cervix is one of the leading causes of cancer deaths in women.<sup>1</sup> In India it accounts for 26.1 to 43.8% of cancers in women.<sup>2</sup> The precancerous lesions-cervical intraepithelial neoplasia constitute a very important group of lesions and if diagnosed and treated properly, can decrease the morbidity and mortality due to cervical cancer by 100%. Various screening modalities available for detection of the precancerous lesions include Pap smear and colposcopy. Pap smear is also known as a 'Surface Biopsy'. Pap smear screening programmes provide a low cost way of increasing the coverage of female population and consequently reducing the rate of invasive cervical cancer. Despite its simplicity, it is neither realistic nor practical for developing countries like India. Also it has a problem of high false negative

rate, the reasons for which could be sampling, preparation or interpretation errors. Colposcopy has proved to be a major breakthrough in the quest for early detection of precancerous lesions of cervix. It is useful for further study of women whose cervical smears are positive and of those whose cervix is clinically suspicious despite negative cytological findings. Colposcopy helps to identify abnormal areas which can be biopsied. Another screening method available in resource poor setting is Visual Inspection of cervix with Acetic acid (VIA) where cervix is swabbed with acetic acid and then inspected by naked eye for evidence of abnormality.

A combination of negative Pap smear and co - negative acetic acid when both are available can improve negative predictive value to 91%.<sup>3</sup>

## METHODS

The study was conducted on 300 sexually active women attending the gynaecological OPD at Dayanand medical college and hospital, Ludhiana.

Pap smear was taken and followed by visual inspection of cervix with acetic acid in all the women. Cervix was swabbed with 3% acetic acid and examined with a bright light to identify acetowhite lesions in the transformation zone. Interpretation of the Pap smears was done using Bethesda system 2001.<sup>4</sup>



**Figure 1: Acetowhite areas after application of 3% acetic acid.**

The inclusion criteria included women detected to have unhealthy cervix by per speculum and/or by bimanual examination. Pregnant women were excluded from the study.

Colposcopy was done in 105 women who had abnormal Pap smear or suspicious cervix or were VIA positive. Classification was done according to the recommendations of the International Federation for Cervical Pathology and Colposcopy (IFCPC) 2002.<sup>5</sup>

Cervical biopsy was taken in 87 cases following colposcopy. Observations and results were compared and analyzed.

## RESULTS

The mean age of women presenting to the OPD was 39.38 years. 166 (55.3%) women were from urban areas and 33 (11 %) belonged to low socioeconomic status. 168 (56.00%) women belonged to the Sikh community and 283 (94.30%) women were literate.

The mean age of menarche was 13.18 years. The mean age of first coitus was 20.74 years. Only 4 (1.30%)

women were nulliparous. 249 (83.00 %) women were pre-menopausal and 51 (17.00 %) were post-menopausal.

On bimanual examination, 26 (8.67 %) women had a firm consistency of the cervix. Bleeding on touch was present in 63 (21.00 %) women. Uterus was normal in 63.3% of the cases.

### **Results of visual inspection with acetic acid (VIA) (Table 1)**

Out of the 300 patients screened, 71 (23.67%) were VIA positive. On analysing the relationship of presenting complaints with VIA results, out of 133 women presenting with discharge per vaginam 35 (26.31%) were VIA positive.

The most significant finding was seen in patients presenting with post-coital bleeding where 61.90% were VIA positive.

In women with cervical erosion, incidence of VIA positivity was 24.16% which was almost similar to that found in hypertrophied/chronic cervicitis 26.08%. 50% patients with firm cervix & 44.44% patients whose cervix bled on touch were VIA positive.

**Table 1: Results of visual inspection with acetic acid (VIA).**

Results	Number	Percentage
VIA positive	71	23.67%
VIA negative	229	76.33%
<b>Total</b>	<b>300</b>	<b>100</b>

### **Results of Pap & colposcopy**

Epithelial abnormalities on Pap smear were present in 28 (9.40 %) women. ASCUS - 9 (3.00 %), LSIL - 17 (5.67 %), AGUS - 1 (0.33 %), HSIL - 1 (0.33 %).

Colposcopic examination was done in 105 women who had abnormal cervical cytology or VIA positive or those with suspicious cervix. Grade I findings were present in 2 (1.9%) women. Grade II colposcopic abnormality was present in 34 (32.38 %) women while 13 (12.38 %) women had findings suggestive of frank invasive cancer i.e. Grade III findings. Unsatisfactory colposcopy (Grade IV) was seen in 6 women and Grade V findings were present in 50 (47.62 %) women.

### **Correlation of VIA and Pap test (Table 2)**

Out of 270 normal/inflammatory pap smears, VIA was negative in 214 showing high true negative rates.

VIA is highly sensitive for high grade lesions, as all HSIL lesions on Pap were found to be VIA positive.

**Table 2: Agreement between diagnosis of via and Pap test.**

		Pap test					Total
		Normal	Inflammatory	ASCUS/AGUS	LSIL	HSIL	
VIA	Negative	5	209	5	8	0	227
	Positive	2	54	5	9	1	71
	Total	7	263	10	17	1	298

**Evaluation of VIA with reference to colposcopy (Table 3)**

42 out of 49 colposcopy positive patients were also positive on VIA which indicates high sensitivity of VIA.

**Table 3: Agreement between VIA and colposcopy.**

	Colposcopy positive	Colposcopy negative	Total
VIA positive	42	24	66
VIA negative	7	26	33
Total	49	50	99

**Evaluation of VIA with reference to biopsy (Table 4)**

VIA could detect 43 out of 50 biopsy proven dysplasias accounting for a high sensitivity of 86%. Specificity of VIA was found to be low - 40.50%.

**Table 4: Evaluation of via with reference to biopsy (n=87).**

	Biopsy positive for preinvasive lesion	Biopsy negative for preinvasive lesion	Total
VIA positive	43	22	65
VIA negative	7	15	22
Total	50	37	87

$$\text{Sensitivity of VIA: } \frac{43 \times 100}{50} = 86\%$$

$$\text{Specificity of VIA: } \frac{15 \times 100}{37} = 40.5\%$$

$$\text{Percentage of false negatives: } \frac{07 \times 100}{50} = 14\%$$

$$\text{Positive predictive value: } \frac{43 \times 100}{65} = 66.18\%$$

$$\text{Percentage of false positives: } \frac{22 \times 100}{37} = 59.5\%$$

$$\text{Negative predictive value: } \frac{15 \times 100}{22} = 68.18\%$$

Among the 43 biopsy positive patients, koilocytic changes and mild dysplasia (LSIL) were seen in 38 (58.46%) patients, moderate dysplasia (HSIL) in 4 (6.15%) and carcinoma in situ in one case (1.54%) only.

**DISCUSSION**

In the present study, epithelial abnormalities were found in 28 (9.40%) out of 300 women who had undergone Pap smear screening. Of these women, ASCUS was reported in 9 (3.00%), LSIL was reported in 17 (5.67%), AGUS was reported in 1 (0.33%) and HSIL was reported in 1 (0.33%) women. Gehlot M et al.<sup>6</sup> reported the incidence of moderate to severe dysplasia as 1.0% which is comparable to that in our study. When only abnormal smears were considered, mild dysplasia was seen in 60.71% patients which is comparable to study of Luthra et al.<sup>7</sup> (62.60%).

Data from our study showed that the sensitivity of Pap smear was very low (24%). The specificity turned out to be 80.56% and predictive value of positive test was 63.16%. However, the sensitivity to detect higher grade lesions improved to 66.67% which is comparable to study by Vandergraff et al.<sup>8</sup> where it was 70.10%.

**Visual inspection with acetic acid**

In our study, the VIA positive rate was 23.67% which is similar to that reported by Belinson et al.<sup>9</sup> i.e. 27%.

Out of 50 biopsy positive cases, 43 were detected by VIA resulting in sensitivity of 86% and false negative rate of 14%. Various studies show sensitivity of VIA ranging from 63-77%, though specificity is much lower 43-74%. The wide variation in results is because different criteria have been used to define a positive test and in most studies, VIA was performed by paramedical workers. Our results showed a comparatively high sensitivity (86%) probably because the screening was performed by doctors and uniform criterion were used.

**Colposcopy**

In the present study, sensitivity of colposcopy was found to be 73.91% with specificity of 65.62% respectively. Kushtagi P et al.<sup>10</sup> in their study reported the sensitivity of colposcopy to be 78% which is similar to our study.

**Comparison of VIA versus Pap**

Our results are consistent with other recent studies, which show that VIA is more sensitive but usually less specific than cytology. Also in our study the specificity of VIA was low (40.50%). In other studies the specificity of VIA has ranged from 43 to 92%.<sup>9,11</sup>

### Colposcopy versus VIA and Pap

The sensitivity of VIA (86%) was higher in comparison to colposcopy (73.91%), while specificity of VIA (40.50%) was much lower than that of colposcopy (65.62%).

### CONCLUSION

VIA is a sensitive, practical and a low cost affair when it comes to cervical cancer screening. The high false positivity which leads to unnecessary referrals and overtreatment can be decreased significantly if another mode of screening is combined along with it. With the advantages of low cost, easy feasibility, no need of special equipment and immediate results, VIA, seems to hold the future for cervical cancer screening.

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