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

Sunita Goyal¹, Pooja Tandon¹*, Nidhi Bhutani¹,³, Bhupinder K. Gill¹

¹Department of Obstetrics & Gynaecology, DMC&H, Ludhiana, Punjab, India
²Department of Obstetrics & Gynaecology, CMC&H, Ludhiana, Punjab, India
³Department of Obstetrics & Gynaecology, GSMCH, Patiala, Punjab, India

Received: 26 July 2014
Accepted: 8 August 2014

*Correspondence:
Dr. Pooja Tandon,
E-mail: drpj_2007@yahoo.com

© 2014 Goyal S et al. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

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.¹ In India it accounts for 26.1 to 43.8% of cancers in women.² 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%.³
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 2001.4

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 vaginum 35 (26.31%) 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>
<thead>
<tr>
<th>Results of visual inspection with acetic acid (VIA).</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIA positive</td>
</tr>
<tr>
<td>VIA negative</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Pap test</th>
<th>Normal</th>
<th>Inflammatory</th>
<th>ASCUS/AGUS</th>
<th>LSIL</th>
<th>HSIL</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>5</td>
<td>209</td>
<td>5</td>
<td>8</td>
<td>0</td>
<td>227</td>
</tr>
<tr>
<td>Positive</td>
<td>2</td>
<td>54</td>
<td>5</td>
<td>9</td>
<td>1</td>
<td>71</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>263</td>
<td>10</td>
<td>17</td>
<td>1</td>
<td>298</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Colposcopy positive</th>
<th>Colposcopy negative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIA positive</td>
<td>42</td>
<td>24</td>
</tr>
<tr>
<td>VIA negative</td>
<td>7</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>50</td>
</tr>
</tbody>
</table>

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).

<table>
<thead>
<tr>
<th>Biopsy positive for preinvasive lesion</th>
<th>Biopsy negative for preinvasive lesion</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIA positive</td>
<td>43</td>
<td>22</td>
</tr>
<tr>
<td>VIA negative</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>37</td>
</tr>
</tbody>
</table>

Sensitivity of VIA: \[ \frac{43 \times 100}{50} = 86\% \]

Specificity of VIA: \[ \frac{15 \times 100}{37} = 40.5\% \]

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

Positive predictive value: \[ \frac{43 \times 100}{65} = 66.18\% \]

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

Negative predictive value: \[ \frac{15 \times 100}{22} = 68.18\% \]

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.\(^6\) 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.\(^7\) (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.\(^8\) 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.\(^9\) 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. Kushhtagi P et al.\(^10\) 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%.\(^9,11\)
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.

ACKNOWLEDGEMENTS

Guarantors of integrity of the study - Dr. Sunita Goyal, Dr. B. K. Gill, Dr. Pooja Tandon, Dr. Nidhi Bhutani.

Study concepts and design Dr. Sunita Goyal, Dr. B. K. Gill.

Literature research, clinical studies, data acquisition and data analysis - Dr. Pooja Tandon, Dr. Nidhi Bhutani.

Manuscript editing and review - Dr. Sunita Goyal, Dr. Pooja Tandon, Dr. Nidhi Bhutani Dr. B. K. Gill.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES


DOI: 10.5455/2320-1770.ijrcog20140963