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Visual Inspection of the Cervix with Acetic Acid and Pap smear Test in Cervical Cancer Screening

Dr.Pooja Gupta[1], Dr.Tajinder kaur[2], Dr.Sanjay Bedi[3] Dr.Geetanjali Tuteja[4]
[1]*(Obstetrics & Gynaecology, Hanumant Endosurgery Centre, Gomti Nagar, Lucknow,India)*
[2]*(Obstetrics & Gynaecology, MMIMSR/MMU, Mullana ,Ambala,India)*
[3]*(Pathology, MMIMSR/MMU, Mullana, Ambala,India)*
[4]*(Obstetrics & Gynaecology, MMIMSR/MMU, Mullana ,Ambala,India))*

Abstract: *This study was conducted to evaluate and compare visual inspection of cervix with acetic acid and pap smear for cervical cancer screening. Pap smear was done in all 200 cases along with VIA Abnormal cases with positive VIA and/or abnormal Pap smears were subjected to colposcopy directed biopsy.Cervical biopsy was taken in 78 cases. Pap test showed sensitivity of 25.71% and specificity of 88.37% while sensitivity of VIA was 80% and specificity of 32.55% respectively. Thus it was concluded that VIA is a sensitive,practical and a low cost affair when it comes to cervical screening. Pap is more specific but it needs more of expertise whereas VIA doesn't require expertise and can be done at a primary level.*

Keywords: *High grade squamous intraepithelial lesion (HSIL), Low grade squamous intraepithelial lesion (LSIL), Negative predictive value (NPV), Positive predictive value(PPV),Visual inspection of cervix with acetic acid(VIA), Statistical Package for Social Sciences (SPSS), Pap (Papanicolaou stain)*

I. Introduction

Cervical cancer , a malignant neoplasm of the cervix uteri, is the leading cause of cancer deaths in women. Worldwide , cervical cancer takes the lives of 23,000 women annually, with over over 80% of these deaths occurring in developing countries. In India , cervical cancer is the most common women related cancer followed by breast cancer, accounting for 26%- 43.8% of all cancers in Indian women.[1]

The goal of cervical cancer screening is the detection and treatment of precancerous lesions before cancer develops[2,3,4], thus reducing the incidence of cervical cancer .Down staging of cervical cancer is the detection of the disease at an earlier stage, done by nurses and other paramedical health workers using a simple speculum for visual inspection of cervix.

The conventional method of cervical cancer screening is by Pap smear, but it requires trained cytotechnologists, cytology labs, patient compliance and follow up which is not readily available in developing countries. VIA has been researched as one of the effective alternative. VIA has demonstrated high sensitivity for detecting cervical cancer but is limited by low specificity[5,6,7],. VIA requires minimal resources and training . It has also been recommended by WHO, as an alternative to cytology to pick up a patient at risk for cancer cervix[8].

This study was designed to evaluate clinical performance of VIA as a simple test and if it is a suitable alternative to Pap smear for early detection of cancer cervix.

II. Material And Methods

This prospective study was conducted on 200 sexually active women in age group 18- 50 years attending gynae OPD at MMIMSR. Informed consent was taken. Pregnant females, women who have frank cervical growth and women who had hysterectomy or treated for cervical pre-cancer or cancer in the past were excluded from the study.

The women were placed in dorsal position, unlubricated cusco's bivalve speculum was inserted into vagina under direct light source to visualize cervix. Pap smear was taken with the help of wooden Ayer's spatula, scrapping the entire squamocolumnar junction . The smear was uniformly spread on two prelabelled glass slides and promptly fixed in 95% ethyl alcohol for fixation. A cotton swab soaked in 5% acetic acid was applied to cervix for 1 minute. VIA was labeled positive if distinct aceto white areas were seen adjacent to squamocolumnar junction. Pap smear were sent to hospital pathology labs and were interpreted in accordance with the Bethesda system[9].

The women who showed positive test result with either VIA or Pap smear or both were further subjected to colposcopy directed biopsy . The histology of cervical biopsy was taken as gold standard to compare cytology and VIA. Biopsies were evaluated by pathologist blinded to the VIA results but who , following institutional guidelines , were aware of the cytological results.

A predesigned proforma was filled for each patient. The data was analysed statiscally SPSS version 15.0. Statistical analysis software. Sesitivity , specificity , and predictive values of VIA and Pap smear were calculated separately and combined using standard statistical formulas. (10)

III. Results

A total of 200 women were studied from October 2011 to October 2013. Sociodemographic characterstics of the clients show that maximum number of women 117 (58.5%) were from age group 31-40 years ,59 (29.5%) belonged to 20-30 yr age group and 24(12%) were from age group 41-50years. 109 (54.5%) women belonged to middle socioeconomic status , 46 (23%) belonged to lower socioeconomic group and 45(22.5%) belongs to upper socioeconomic status. 46 females (23%) had their first coitus at age of 18 years with mean age of coitus of 18- 45 years. 103 (51.5%) were multipara while 18(9%) were grandmultipara (table 1)

Pap smear diagnosed 93 (46.5%) of women as normal 77(38.5%) as inflammatory, 17 (8.5%) as LSIL and 2 (1%) as HSIL and AGS was seen in 8(4%) of women.

Out of 14 Pap positive cases 9 were confirmed negative with biopsy histology while out of 64 negative Pap tests 26 were confirmed positive with biopsy. This gave Pap a sensitivity of 25.7% and specificity of 88.37%.A positive predictive value of 64.28% and negative predictive value of 59.37%.(table 4)

VIA was positive in 83(41.5%). A total of 78 biopsies were taken out of which 43(55.1%) showed evidence of inflammation 30(38.5%) showed LSIL , while 3 (3.8%) were HSIL. Only 2 (2.6%) came out to be carcinoma in situ.(table 3)

Out of 57 cases positive to VIA , 29 were confirmed negative with biopsy histology, while 7 of those that were negative to VIA were confirmed positive with biopsy histology. These gave a sensitivity of 80%, specificity of 32.55%, positive predictive value of 49.12% and negative predictive value of 66.66%. (table 5). A positive predictive value of 64.28% and negative predictive value of 59.37%.

Those that were missed by VIA were LSIL and so is the case with Pap with exception of 1 HSIL missed by Pap.VIA had a false positive rate of 67.44% and false negative rate of 20%.Pap demonstrated a false positive rate of 11.62% and false negative 74.28% respectively.

Socio-Demographic Data Of Clients (Table 1)

Characterstics	Frequency	Percentage
Age (years)		
20 – 30	59	29.5
31 – 40	117	58.5
41 – 50	24	12
Parity		
1 & 2	103	51.5
3 & 4	79	39.5
>= 5	18	9.0
Socioeconomic status		
Upper	45	22.5
Middle	109	54.5
Lower	46	23

IV. Figures And Tables

Results Of Visual Inspection Of Cervix With Acetic Acid (Via) (Table 2)

Result	Number	Percentage
VIA Positive	83	41.5
VIA Negative	117	58.5
Total	200	100

Results Of Cervical Biopsy (Table 3)

HPE Report	Number (n= 78)	Percentage
Cervicitis/Endocervicitis	43	55.1
LSIL	30	38.5
HSIL	3	3.8
CIS	2	2.6
Total	78	100

Evaluation Of Pap Test With Reference To Biopsy (Table 4)

	Biopsy positive for preinvasive lesions	**Biopsy negative for preinvasive lesions**	**Total**
Pap positive	9	5	14
Pap negative	26	38	64
Total	35	43	78

Sensitivity of Pap = 25.71%, Specificity of Pap = 88.37%, Positive predictive value = 64.28%, Negative predictive value = 59.37%

Evaluation Of Via With Reference To Biopsy (Table 5)

	Biopsy positive for preinvasive lesions	**Biopsy negative for preinvasive lesions**	**Total**
VIA Positive	28	29	57
VIA Negative	7	14	21
Total	35	43	78

Sensitivity of VIA = 80%, Specificity of VIA = 32.55%, Positive predictive value = 49.12%, Negative predictive value = 66.66%

V. Discussion

Cytology based programmes have achieved very limited success in developing countries like India due to lack of trained personnel lab facilities, equipments, high cost of services and poor follow up. VIA, because of its simplicity and rapidity of performance, has emerged as a promising alternative to Pap smear in the developing countries

Pap smear was abnormal for any grade of abnormality in 27(13.5%) of cases which is higher as compared to studies that report incidence of 5.2% and 4.6%.[10,11] Sherwani RK given an incidence of 15%[12]The variation can be because of this study being an opportunistic screening in patients presenting with various symptoms and not mass screening .

Our study revealed that VIA has significantly higher sensitivity than Pap smear,80% vs 25.71%. Various studies cited in the literature show sensitivity of VIA as 63.5% , 71% and 88.9% [13,14,15]. A low sensitivity of Pap smear low has been observed in studies of Basu et al (29.5%) , El Shalanky et al (16.9 %) , ZIMBABWE cancer project and Londhe et al (13.2%)[13,16,17,18.] On the other hand some studies reflect a high sensitivity of Pap smear of 83% by Shastri , 79% by Arbyn M .

Our study showed a low specificity for VIA 32.55% and high false positive rate of 67.44%. In literature VIA demonstrates a specificity range 67.3 to 92.2% respectively.[13,19] In the present study Pap had a specificity of 88.37%. Specificity of 87.8% for pap was given by Sankaranarayanan et al, 90.6% by Zimbabve cancer project and 90.2% by Ghaemmaghami F et al.[13,19,20]High false positive of VIA may be because many cases had chronic inflammation of cervix. In our study negative predictive value was similar for VIA and Pap, with slightly high positive predictive value for Pap.

VI. Conclusion

Owing to the low sensitivity of Pap smear ,addition of VIA may improve detection rate of CIN. In a low resource setting VIA can be an effective alternative to Pap smear and also quick results obtained with VIA, may solve the problem of patient being lost to follow up.

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