

Comparative Evaluation of PAP Smear and Visual Inspection of Acetic Acid (VIA) in Cervical Cancer Screening Program in Lady Willingdon Hospital, Lahore

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Objective: To compare the performance of Pap smear with visual inspection of cervix after spraying 5% acetic acid as an alternative cervical cancer screening modality in a low resource setup.

Design: Comparative study.

Place and Duration of Study: A pilot study was conducted on the first 100 women presenting from 1st Nov-31st Jan 2010 at gynaecological clinics, Lady Willingdon Hospital, affiliated with King Edward Medical University, Lahore, Pakistan.

Materials and Methods: During the gynaecological speculum examination a Pap smear was taken and then 5% acetic acid was sprayed on the cervix using a spray bottle. The observations were noted as VIA positive or negative according to aceto-white changes. Similarly cytology result was graded as CIN1, 2 and 3. Those women who showed positive test result with either VIA or Pap smear or both tests were further subjected to colposcopy directed biopsy. The histology of cervical biopsy was taken as gold standard to compare the performance of VIA and cytology. Estimation of sensitivity, specificity and predictive values were calculated by using standard statistical formulae.

Results: Out of 100 subjects, 85 were negative with both screening techniques. Twenty four were positive with VIA while Pap smear was positive in 12 subjects. Histological diagnosis of CIN/cancer was made in 16 out of the total 26 patients who underwent biopsy. The sensitivity of VIA was 93% and of Pap smear was 83%. Corresponding specificities were 90% and 97%. VIA was more sensitive than Pap smear which was statistically significant (P value < .05). The PPV of VIA was 62.5% versus 83% for Pap smear which is statistically significant (P value < 0.001) The NPV of VIA was 98% versus 97% for cytology. There was no significant difference between the negative predictive values (NPV) of both tests (P value equals 1). Overall, VIA demonstrated an accuracy of 90% as compared to 96% for cytology.

Conclusion: These results indicate that VIA is more sensitive as compared to Pap smear. The detection rate of early lesions of cervix using VIA is comparable to Pap smear in validity and usefulness. In developing countries VIA is an effective method to achieve fairly accurate and moderately reproducible results in detecting cervical cancer precursors.

Key Words: Cervical cancer screening, Visual Inspection with acetic acid, Pap smear.

Introduction

We can now prevent cervical cancer which is the second most commonly diagnosed cancer among women worldwide.¹ The Pap smear remains the most common screening test for cervical cancer, however many developing countries do not have ample resources to implement cytology-based prevention programs.² An alternative of Pap smear, a low-cost test, visual inspection using acetic acid (VIA), has emerged for use in low-resource settings where it can be performed by trained health professionals.³ During examination the acetic acid is applied to the cervix and any aceto-white lesion is observed either with naked eye or under magnification through colposcope.⁴

The objective of this project was to study the comparison of Pap smear as a primary method of cervical cancer screening and visual inspection using acetic acid. The specific objective was to determine the proportion of women screened positive with VIA and with Pap smear and to determine the diagnostic efficacy of Pap smear and VIA.

Materials and Methods

This prospective study was carried out in Gynecological Clinics of Lady Willingdon Hospital in Lahore, Pakistan. A pilot study was conducted on the first 100 women presenting from 1st Nov-31st Jan 2010. Women who already had hysterectomy or treatment for cervical precancer or cancer in the past were not included in the study. Pregnant women were also excluded from the study.

Demographic information was collected in a computer based database. A gynecological speculum examination was performed for each woman, Pap smear was taken and 5% acetic acid was sprayed on the cervix using a spray bottle. The test results were divided in two categories as VIA-negative and VIA-positive. When any of the findings like a well-defined dense opaque acetowhite lesion close to the squamocolumnar junction or acetowhite area touching the transformation zone was observed the result was reported as VIA-positive. On the other hand if no acetowhite lesion, faint and bluish white translucent acetowhite lesion or a

white-line indicative of squamocolumnar junction was observed, VIA-negative was reported.

Among the VIA positive, distinct acetowhite areas were further categorized as VIA-positive grades 1, 2 and 3 according to the severity. Similarly CIN (1, 2, and 3) or worse lesions by cytology were considered as positive smears. Those women who showed positive test result with either VIA or Pap smear or both tests were further subjected to colposcopy directed biopsy. The histology of cervical biopsy was taken as gold standard to compare the performance of VIA and cytology. Those for whom histology revealed no pathology or reactive/reparative change or inflammation were considered as false positives.

Estimation of sensitivity, specificity and predictive values, calculated by using standard statistical formula was performed on the women who had a final diagnosis of various grades of cervical dysplasia.

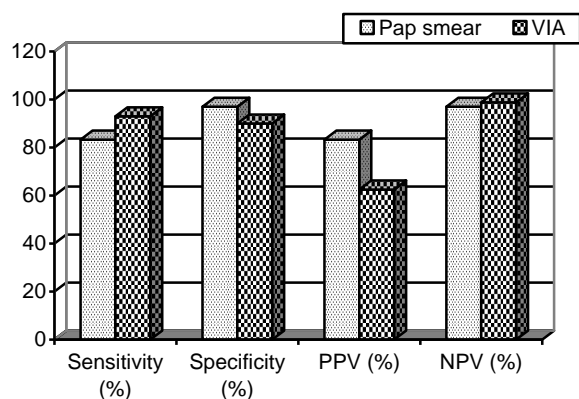


Fig. 1: Column chart of performance of screening tests, Pap smear: VIA in 100 patients.

Results

These are the results of pilot study of first 100 women undergoing cervical cancer screening. On VIA (visual inspection with acetic acid), 24 out of 100 women screened had acetowhite lesions. On Pap smear, 12 out of the 100 women had CIN 1 or worse lesions. Of the 100 enrolled women, 10 were positive on both VIA and cytology; 14 were positive on VIA only; and 2 on cytology only. So 26 patients with suspicious cervix and VIA or smear positive had cervical biopsies performed on them. Histological diagnosis of CIN/ cancer was made in 16 out of the total 26 patients who underwent biopsy. Pap smear picked up 10 out of the 16 biopsy-proven cases. VIA could identify 15 out of the 16 CIN/carcinoma cervixes. VIA was more sensitive (93%) than

Table 1: Performance of screening tests in detecting dysplastic lesions of the uterine cervix.

Screening test	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
VIA	93	90	62.5	98.8
Pap smear	83.3	97	83	97

Pap smear (83.3%), which was statistically significant. However, the specificity of Pap smear was more (97%) than that of VIA (90%). The PPV of cytology was 83.3% versus 62.5% for VIA. The NPV of VIA was 98.8% versus 97% for cytology. The two-tailed P value of NPV equals 0.5 indicating that the association between two groups is considered to be not statistically significant.



Fig. 2: Colposcopy view of squamocolumnar junction.



Fig. 3: Colposcopy view of acetowhite changes in cervix.

Discussion

Among the female population of Pakistan, the invasive cancer of cervix is the third commonest malignancy.⁵ By the time most patients appear to the hospitals the cancer has already advanced to stages two or three.⁶ VIA has shown its potential value as an effective screening approach in less-developed countries in several studies.^{7,8}

According to our results, we can effectively screen most of the cases with cervical pre-cancer and cancer through VIA. The detection rate of cervical dysplasia in both VIA and the Pap smear is equal in this pilot study. The VIA has better negative predictive value than that of the Pap smear and a lower specificity than that of cytology or Pap smear. Due to high negative predictive value, when the test result is negative, the woman can be reassured that she is not likely to have a neoplastic cervical lesion.

In the developed countries, the efficacy of programmed Pap smears in screening for cervical cancer and its precursors has long been established. It looks difficult that in the foreseeable future the logistic requirements of regular Pap smear would be met in developing countries.⁹ VIA by trained workers offers hope for universal screening as an alternative method for low resource settings.^{10,11} VIA and VILI (visual inspection with Lugol's iodine) need the skilled personnel otherwise this may result into a large number of unnecessary referrals with anxiety and varied logistic problems.^{12,13} To keep the quality control, the careful monitoring of these techniques are required.¹⁴ However another way of improving specificity of the test without compromising sensitivity is to add an adjunctive Pap smear or HPV testing in acetowhite positive cases.¹⁵

In this pilot study, we have measured the performance of VIA and cytology as a means of identifying the cervical cancer precursors in a low resource setting. As compared to Pap smear VIA has the advantage of being simple and easy-to-learn approach. Moreover VIA has low startup and ongoing costs. It integrates well with the primary health care services. VIA gives the facility of see and treat due to immediate results at one stop clinic.

On the other hand VIA has the disadvantages of higher referral and potential of over-treatment due to its moderate specificity. There is clear need for training methods and quality assurance to standardize the reporting procedure.

Conclusion

This study indicates that women are willing to accept VIA screening. The detection rate of early lesions of cervix using VIA is comparable to Pap smear in validity and usefulness. In developing countries VIA is an effective method to achieve fairly accurate and moderately reproducible results in detecting cervical cancer precursors. However standardized and competency-based training of wide range of health care providers is required.

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