

Concordance Between Visual Inspection with Acetic Acid Test and Pap Smear in Detection of Cervical Cancer

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ABSTRACT

Objective To determine the agreement between visual inspection with acetic acid test (VIT) and Pap smear in detection of cervical cancer.

Study design Cross-sectional study.

Place & Duration of study Department of Obstetrics and Gynaecology Unit-II, Jinnah Postgraduate Medical Centre Karachi, from March 2013 to April 2014.

Methodology Attendants of the patients visiting antenatal clinic were included in this study. VIA test was performed by the application of 05% acetic acid on the cervix through cotton tipped applicator. After 5 minutes a naked-eye assessment was performed under direct illumination of a 100-watt halogen lamp. A positive visual inspection with acetic acid test was defined as opaque, acetowhite lesions with raised surface and well defined margins present on the cervix. The Pap smear sample was obtained by conventional method and fixed with 95% ethanol for 30 minutes before sending to the laboratory for reporting.

Results A total of 217 patients were selected. Positive agreement between VIA test and Pap smear was found in 158 (72.8%) cases. Agreement was also cross checked with cervical cancer risk factors like age, parity, literacy and socio-economical status. Mean age of the study participants was 34.46 year. Majority (n=89 - 41%) of the women were illiterate, belonged to the poor socioeconomic class (n=52 - 24.1%) and multipara (n=149 - 68.6%).

Conclusion Overall agreement of similar results between VIA test and Pap smear was found in majority of the patients.

Key words Cervical screening, Visual inspection with acetic acid test, Pap smear.

INTRODUCTION:

Worldwide cervical cancer is fourth commonest cancer and fourth common cause of death from cancer in women.¹ In 2012, an estimated 528,000 cases of cervical cancer occurred, with 266,000 deaths and about 70% of cervical cancer occurred in developing countries.¹ Cervical cancer is the 3rd

commonest malignancy and 5th leading cause of cancer deaths in woman aged 15 – 44 year in Pakistan.² By the time most patients report to the hospitals, the cancer already advanced to stage II or III.³

Substantial reduction in cervical cancer will only be realized if sustainable cervical cancer screening programs are implemented on global scale to assure early detection and treatment of precancerous lesions. Screening with the use of Pap smear and liquid base cytology has contributed significantly to reduction in frequency of cervical cancer in developed countries.⁴ In addition screening for human papilloma virus with the use of DNA testing has proven useful in early detection of the disease.⁵ These methods of screening nevertheless, are very difficult to

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implement in low-resource countries due to the lack of laboratory infrastructure and well trained, experienced professionals. There is a vital need for alternative preventive methods for cervical cancer detection in developing countries.⁶

Recently, interest in visual inspection with acetic acid test has increased. Numerous studies have been conducted on its accuracy and ability to detect cervical lesions when compared with other techniques.⁷ Visual inspection with acetic acid has emerged as a promising screening method alternative to cytology based methods. This test is easy to perform, cost-effective, and fits well to resource poor countries.⁸

The sensitivity and specificity of visual inspection with acetic acid test in detection of cervical cancer was found to be 60.2% and 41.9% respectively in an international study,⁹ whereas in a national study the sensitivity and specificity of visual inspection with acetic acid test for cervical cancer was found to be 93% and 90% respectively.¹⁰ As far as diagnostic accuracy of Pap smear in detection of cervical cancer is concerned, the sensitivity and specificity was found to be 47.7% and 83.8% in an international study,⁹ whereas in a national study it was found to be 83% and 97% respectively.¹⁰ How effective these tests are, is still controversial.

In numerous studies the diagnostic accuracy was assessed by the histopathology (gold standard) which was done only on screened positive test either on visual inspection with acetic acid or Pap smear.^{11,12} Most experts do not recommend the use of Pap smear in low resource setting. As a result of these severe limitations, WHO suggested to use alternative strategies like visual inspection of cervix. Therefore keeping in view the the above stated literature, the present study was undertaken to compare the two tests to find the agreement between them.

METHODOLOGY:

This cross-sectional study was conducted in the Department of Obstetrics and Gynaecology Unit-II, Jinnah Postgraduate Medical Centre Karachi, from March 2013 to April 2014. Women (Attendants of the patients) were selected through non-probability consecutive sampling technique. All the women who were asymptomatic, between the age of 25 to 50 year, sexually active with no history of cervical cancer, never screened for cervical cancer and having apparently normal cervix (pinkish in color) were included. Women who were pregnant, with history of amenorrhea, active vaginal bleeding, frank growth and those who had undergone hysterectomy, were excluded from the study.

The purpose, procedure, risks and benefits of the study were explained by the principal investigator in details and confidentiality was ensured before taking informed consent. First of all visual inspection with acetic acid test was done by using cotton tipped applicator. After 5 minutes a naked eye assessment was performed under direct illumination of a 100 watt halogen lamp. A positive visual inspection with acetic acid test was defined as well marginated, raised, opaque, acetowhite lesion(s) observed on the cervix uteri. The Pap smear sample was obtained by using a spatula. The Pap smear were fixed with 95% ethanol for 30 minutes and sent to the institutional laboratory. Positive cytology diagnosis was considered when atypical squamous cells were found. These findings along with age, parity educational status and economic status were recorded. Women were categorized according to their family income status into poor (income of < Rs. 15000, lower-middle Rs.16000-25000, upper-middle Rs.26000-50000 and upper class Rs >50000).

Data was entered and analyzed on SPSS software version 17. Mean and standard deviation were presented for age of the patients. Frequency and percentages were used for parity, educational status, economic status, positive visual inspection with acetic acid test, positive Pap smears test and agreement between the two. Kappa statistics were applied between the two tests. Stratification of age, parity, educational status and economic status was done to find out the difference between the two tests. Chi square test was applied and p value <0.05 was taken as significant.

RESULTS:

A total of 217 patients from Gynaecology outpatient department were selected. Mean age of the study population was 34.46 + 8.90 year with a range from 25 year to 50 year. Out of the total, 89 (41%) were illiterate, 76 (35%) had education up to class eight, and 38 (17.5%) were Matric pass. The distribution of socio-economic status is shown in table I. Majority (n=113 - 52.1%) of the women belonged to poor class. Most of the women were multipara.

The over all agreement of similar results (either positive or negative) on visual inspection with acetic acid test and Pap smear was found in 158 (72.8%) and were labeled as agreement positive (table-II). Out of total patients, 173 (79.7%) women had negative and remaining 44 (20.3%), positive Pap smear results (table II).

Stratification of age group, parity distribution, economic status was compared with overall positive

Table I: Comparison of Different Variables With Overall Positive Agreement of the Test				
Age group	Agreement		Total	p-value
	Yes	No		
< 30 year	76 (35.0%)	22 (10.1%)	98 (45.2%)	X ² = 5.566 p=0.05* Significant
31 – 40 year	53 (24.4%)	30 (13.8%)	83 (38.2%)	
41 – 50 year	29 (13.4%)	07 (3.2%)	36 (16.6%)	
Total	158 (72.8%)	59 (27.2%)	217 (100%)	
Parity Status				
Primary	35 (16.1%)	23 (10.6%)	58 (26.7%)	X ² = 18.30 p=0.00* Significant
Multipara	120 (55.3%)	29 (13.4%)	149 (68.7%)	
Grandmultipara	03 (1.4%)	07 (3.2%)	10 (4.6%)	
Total	158 (72.8%)	59 (27.2%)	217 (100%)	
Education Status				
Illiterate	66 (30.4%)	23 (10.6%)	89 (41.0%)	X ² = 2.013 p=0.570 Non-Significant
Middle	52 (24.0%)	24 (11.1%)	76 (35%)	
Matric	28 (12.9%)	10 (4.6%)	38 (17.5%)	
Intermediate	12 (5.5%)	02 (0.9%)	14 (6.5%)	
Total	158 (72.8%)	59 (27.2%)	217 (100%)	
Socioeconomic Status				
Poor	86 (39.6%)	27 (12.4%)	113 (52.1%)	X ² = 8.289 p=0.040* Significant
Lower middle	30 (13.8%)	22 (10.1%)	52 (24.0%)	
Upper middle	38 (17.5%)	09 (4.1%)	47 (21.7%)	
Upper class	04 (1.8%)	01 (0.5%)	05 (2.3%)	
Total	158 (72.8%)	59 (27.2%)	217 (100%)	

Table II: Comparison of VIA Test With Pap Smear Test For Overall Positive Agreement of the Test				
VIA Test	Pap Smear Test		Total	p-value
	Positive (n - %)	Negative (n - %)		
Positive	154 (71.0%)	30 (13.8%)	184 (84.8%)	X ² = 11.810 p= 0.01* Significant
Negative	19 (8.8%)	14 (6.5%)	33 (15.2%)	
Total	173 (79.7%)	44 (20.3%)	217 (100%)	

Kappa agreement = 0.39

agreement. Chi-square test was applied and statistically significant relationship (p-value 0.006) found. Statistically non-significant relationship was found for education and overall positive agreement outcome (p-value 0.517).

malignancies among women worldwide. Before initiation of screening and treatment its incidence and mortality was high. High quality screening with cytology (Pap smear) has markedly reduced mortality from squamous cell carcinoma, which comprises 80 – 90% of cervical cancers.¹³

DISCUSSION:

Cervical cancer is one of the most common

Since the introduction of cervical cytology in United State in the mid 20th century cervical cancer, once the most frequent cause of death in women, now ranks 14th for cancer deaths.¹⁴ Cervical cytology remains highly effective and simple non-invasive method for detection of premalignant changes and offers the best mean to control invasion type as these are curable. This study was hospital based on the selective group of women so the results are not representative of the whole population. Furthermore, positive smear is an indication for colposcopy.

It has been estimated that only about 5% of women in developing countries have been screened for cervical dysplasia in past five year compared with about 85% in developed countries.¹⁵ VIA test by trained workers offers hope for universal screening as an alternate method for low resource setting.¹⁶ VIA and VILI (visual inspection with lugol's Iodine) tests need skilled personnel otherwise this may result into large number of unnecessary referrals with anxiety and varied logistic problems.¹⁷ To keep the quality control, the careful monitoring of these techniques are required.¹⁸ However another way of improving specificity of the test without compromising sensitivity is to add an adjunct Pap smear or HPV testing in acetowhite positive cases.¹⁹

The positive agreement between visual inspection with acetic acid test and Pap smear in detection of cervical abnormalities was found 158 (72.8%) in our study. It was also observed in other studies that VIA test and Pap smear both were equally positive in 24 (2.56%) cases out of 934 women and 12 (10%) out of 100 women.^{9,10} Our finding are consistent with another study conducted at Sudan.¹⁰ This was a comparative study of visual inspection with acetic acid and Pap smear for checking the feasibility of visual inspection with the use of acetic acid. The results of histopathology revealed that 88 of 119 (73.9%) confirmed positive with comparison of VIA test and Pap smear test, of which 53 of 71 (74.6%) had a positive VIA test and 35 (72.9%) had a positive Pap smear.

As compared to Pap smear VIA test has the advantage of being simple and easy-to-learn approach. Moreover VIA test has low startup and on-going costs. It integrates well with the primary health care services. VIA test gives an opportunity to visualize and treat, due to immediate results at one stop clinic. On the other hand VIA test has the disadvantage as it may lead to higher referral and potential of over-treatment due to its moderate specificity.

CONCLUSIONS:

The positive agreement between visual inspection with acetic acid test and Pap smear in detection of cervical cancer was found in more than 70% cases. These results indicate that VIA test is more sensitive as compared to Pap smear.

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Author's Contributions:

Urooj Naz: Collected data and result.

Shazia Naseeb: Wrote an article, searched literature, analysed and finalized results.

Samia Shuja: Edited, analysed, reviewed and finally approved.

Conflict of Interest:

The authors declare that they have no conflict of interest.

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