ORIGINAL ARTICLE

# A STUDY OF AGREEMENT BETWEEN VISUAL INSPECTION WITH ACETIC ACID OF CERVIX AND PAP SMEAR FOR CERVICAL CANCER SCREENING

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**Background:** One of the common causes of mortality and morbidity among young women is cervical cancer. Following a wash of cervix through acetic acid, the Papanicolaou (PAP) smears and the visual inspection with acetic acid (VIA), are compared. Objective of the study was to check the level of agreement between the PAP smear for cancer of cervix and VIA. **Methods:** It is a cross-sectional study and was carried out in Obstetrics and Gynaecology department, Sheikh Zaid Hospital, Lahore, Pakistan. All patients were put in lithotomy position and vaginal speculum was applied and pap smear taken followed by 5% acetic acid application to cervix and changes in the cervix noted down. **Results:** Patients with mean age 48±7.795 years were included. In 30 (12%) and 61 (24.4%) patients diagnosis of cervical cancer was positive on PAP smear and VIA respectively. The agreement between two test was significant with Kappa value = 0.322 and *p*-value ≤ 0.00. **Conclusion:** Our study revealed that agreement of PAP smear is almost 80%. VIA on the other hand can be used when there is no access to PAP smear.

**Keywords:** Cervical cancer screening; Visual Inspection with acetic acid (VIA); Pap smear

**Citation:** Ara C, Inayat K, Hanif A, Afsar S, Ullah I. A study of agreement between Visual Inspection with Acetic Acid (VIA) of cervix and pap smear for cervical cancer screening in Obstetrics & Gynaecology Unit of Sheikh Zayed Hospital, Lahore. J Ayub Med Coll Abbottabad 2018;30(4 Suppl 1):668–70.

## INTRODUCTION

The second most common type of cancer among women is cervical cancer.[1] Around 470,000 are annually diagnosed with cervical cancer and 80% of which belong to the developing nations.[2] According to a report by world health organization (WHO), around 260000 women died of cervical cancer in 2005 alone, 95% of which again belonged to the developing countries.[3] For years PAP smear is being used for screening of cervical cancer[4,5] but the high incidence reveals the lack of effectiveness of PAP smear test in the developing countries[6]. Many countries don't even have the facilities to carry out all the steps involved in this test.[7] In about 30% of the cases, in recent studies, false positive PAP smears are reported.[8] In order to overcome the drawbacks in PAP smear test, an alternative "Visual inspection with acetic acid (VIA)" has been proposed for screening of cervical cancer.[9,10] The topical application of acetic acid coagulates the protein contents of both cytoplasm and the enlarged dysplastic nuclei rendering them opaqueness and white color.[11] Opinions of different researchers differ on the authenticity of VIA but still not many consider it as an alternative for screening cervical cancer.[7,12–14] On the other hand some randomized control trials (RCT) did prove VIA as a significant test for reducing mortality in women with cervical cancer.[15] Besides the test can easily be performed by a single person and the results neither need interpretation from another person nor the patients have to come again to collect their reports; a "Screen and Treat Method". VIA is thus recommended as primary screening test for cervical cancer by WHO and is only to be performed by well trained health workers and nurses.[16] This study will help us within our limited resources to establish a hospital based service and training platform for prevention of cervical carcinoma. We intend to evaluate the degree of agreement of VIA with pap smear. As the sensitivity of VIA is more (93%) than pap-smear (83.3%), depending on the study results we intend to implement VIA as an alternative test for screening of cervical cancer where access to pap-smear is lacking.

## MATERIAL AND METHODS

It is a cross-sectional study and was carried out in Obstetrics and Gynaecology department, Sheikh Zaid Hospital, Lahore, Pakistan. (28th January to 27th July 2013). Using 5% margin of error, and 95% confidence level 250 patients was the sample size after taking expected percentage of agreement between VIA & pap smear 84% in cervical cancer screening. Women aged 25–60 years, with history of post coital bleeding or vaginal discharge were included using a non-probability consecutive sampling technique. All patients with hysterectomy and known cervical cancer patient assessed by biopsy we excluded from study. A well

informed consent was obtained from each patient. The hazards and benefits of the procedure were explained to the patient. Patients had right to accept or refuse it. After explaining procedure patients were put in lithotomy position and vaginal speculum was applied and pap smear taken followed by 5% acetic acid application to cervix and changes in the cervix noted down. Report of pap smear was collected from pathology laboratory of Sheikh Zayed Hospital (SZH). Agreement of procedures was considered when both VIA and pap smear give same result regarding presence or absence of cervical pathology, either positive or negative. On VIA after applying 5% acetic acid, acetowhite changes was considered VIA positive & negative if no changes. References for positive smears on cytology were pap CIN (1, 2 & 3) or worse lesions. Data was entered in SPSS version 10. Qualitative variables like pap smear, VIA and agreement were presented in the form of percentages and frequencies. Quantitative variables like age were presented in the form of mean±SD. Kappa statistics were used to determine the strength of agreement between pap smear and VIA in screening cervical cancer taking Kappa between -1 to +1 and *p* value significant at <0.05

## RESULTS

Patients with mean age 48±7.795 years were included with minimum and maximum ages 26 years and 60 years respectively. In this study the age range was 34 years. The calculated mean age of first intercourse was 28.05±2.66 years with range of 10 years (minimum age of intercourse was 25 years and maximum age of intercourse 35 years) highlighted in table-1.

The current marital status was also determined, 245(98%) females were married and 5 (2%) were widows. In 30 (12%) and 61(24.4%) patients diagnosis of cervical cancer was positive on PAP smear and VIA respectively as shown in figure-1. There were 20 cases who were diagnosed positive while 179 cases were diagnosed negative on both tests. The agreement between two test was significant with Kappa value = 0.322 and *p*-value ≤0.00 as shown in table-2.

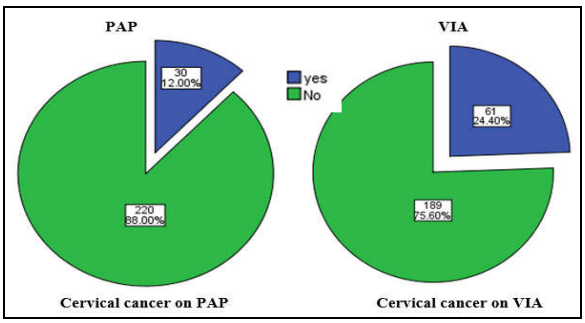


**Figure-1: Cervical Diagnosis Based on PAP and VIA**

**Table-1: Descriptive Statistics of Age (years) and age of first intercourse**

| | Age in years at presentation | Age of first intercourse |
|---|---|---|
| **Mean** | 48.00 | 28.05 |
| **SD** | 7.795 | 2.66 |
| **Range** | 34 | 10.00 |
| **Minimum** | 26 | 25.00 |
| **Maximum** | 60 | 35.00 |

**Table -2: Agreement of Cervical cancer on VIA and Cervical cancer on PAP**

| | | Cervical cancer on VIA | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| **Cervical cancer on PAP** | **Yes** | 20 | 41 | 61 |
| | **No** | 10 | 179 | 189 |
| **Total** | | 30 | 220 | 250 |
| (*p*-value = 0.000) | | | | |

## DISCUSSION

One of the common causes of mortality and morbidity among young women is cervical cancer, with leading prevalence in Asia.[17,18] PAP is commonly used test for its diagnosis but many countries, like Pakistan, don't even have the facilities to carry out all the steps involved in this test.[7,19] In about 30% of the cases, in recent studies, false positive PAP smears are reported.[8] In order to overcome the drawbacks in PAP smear test, an alternative Visual inspection with acetic acid (VIA) has been proposed for screening of cervical cancer.[9,10] Our purpose of study was to evaluate VIA as substitute for PAP smear test, especially in low economic settings. Because of lack of financial resources and training facilities, in under-developed countries, cytology and PAP smear are not viable options. But a 5–10 days training can lead medical and even not medical person to perform VIA on suspected patients.

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. VIA by trained workers offers hope for universal screening as an alternative method for low resource settings.

A study in 2012 reported sensitivity and specificity of VIA as 60% and 94.4% respectively; besides that NPV was 99.4%, PPV was 50% and diagnostic accuracy of VIA was 98.6%.[17] Moreover VIA has been reported very good sensitive but was not specific, i.e., sensitivity was 86% and specificity was 40.50%.[18] On the other hand Ajenifuja KO *et al* reported VIA was not sensitive nor specific when compared to cytology and HPV screening. They reported that 0–21% suspected cancer were identified and 0–25% VIA were positive.[19]

In our study VIA positive cases were 32.78 % which among the positive cases diagnosed with PAP smear. This consistent with D Hedge *et al* study done in 2011.[20] In another study done by Rana T, *et al*.[18] it was concluded that 24 of 100 women screened on VIA, had acetowhite lesions whereas 12 of 100 women had CIN 1 or worse lesions on Pap smear. Of the 100 women included in our study, 10 were found positive on both cytology and VIA, 2 were positive on cytology and 14 were positive on VIA. All 26 women (positive on VIA or cytology or both) later underwent cervical biopsies and 16 were diagnosed positive through histology. Of the 16 confirmed cases 15 were picked by VIA and 10 were identified through Pap smear. VIA was found 93% sensitive whereas pap smear was 83.3% sensitive, with statistical significance of VIA over pap smear.[21]

## CONCLUSION

Our study revealed that agreement of PAP smear is almost 80%. VIA on the other hand can be used when there is no access to PAP smear.

Our results concluded that VIA can be effectively used for screening of cancerous and pre-cancerous cervical lesions. The attractive features of VIA include low cost, simple administration, real time screening of results and accuracy comparable to good quality PAP smears.

## AUTHORS' CONTRIBUTION

CA: conceived the idea, data collection, write-up. KI, AH: Data analysis, literature search. SA, IU: Data analysis, write-up, proof reading.

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| *Received: 09th May, 2018* | *Revised: 19th October, 2018* | *Accepted: 30th December, 2018* |
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