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RESEARCH ARTICLE

Comparing Visual Inspection Using Acetic Acid with the Pap Smear Method in Detecting Cervical Cancer

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Abstract: ***Background***: Cervical cancer is a significant reproductive health issue for women. It is a preventable disease that is a major public health concern, particularly in poor nations. Objective:. This study aimed to compare the effectiveness of VIA and Pap smear for cervical cancer screening. Material and method:. The study included 70 women aged 20 to 60 years old. Following a cervical examination, all participants had a Pap smear test and an acetic acid visual inspection using the VIA method. The VIA method involved applying a 3% acetic acid solution to the cervix for 30-60 seconds and observing it under adequate lighting. If the cervix exhibits a whitening reaction during the acetic acid test, it is considered a positive result. The Bethesda system was used to report the findings of a pap smear test. A positive test result suggests the existence of unknown abnormal squamous cell lesions or more serious lesions. ***Results:*** Among the women screened, VIA was positive in some and the Pap smear was also positive in a subset. The common complaints reported by the patients included vaginal discharge, postcoital bleeding, intermenstrual bleeding, and postmenopausal bleeding. ***Conclusion:*** Using both VIA and Pap smear tests together enhances the detection of cervical cancer, with the conclusion dependent on the results of these two examinations.

Keywords: Cervical cancer, VIA, Pap smear

INTRODUCTION

Cervical cancer is the second most common malignancy in woman and a major cause of morbidity and mortality[1] , accounting for 7.9% of all cancers in women. 90% of this cancer is seen in low- and middle-income nations [2]. According to estimates, cervical cancer saw 550,700 new cases and 286,823 fatalities in 2010. In developing nations, where women frequently lack access to cervical cancer screening and treatment, more than 85% of cases and 88% of deaths from the disease happen [3]. Cervical cancer, in contrast to many other malignancies, can be avoided. The detection of aberrant cervical tissue before it develops into invasive cervical cancer can be accomplished utilizing reasonably affordable technology. Following the adoption of systematic screening programs, The incidence and mortality rates of cervical cancer have markedly declined in most developed countries, including the United States. Access to care, early identification, decreased parity, and other risk factors have all played a role in this trend [4].VIA is a histochemical reaction-based supplementary test for cervical cancer that has higher sensitivity than pap smear but lower specificity. The cervix is directly seen by the health care provider after being washed with acetic acid in this procedure [5]. The Papanicolaou test (Pap smear), visual examination of the cervix with acetic acid (VIA), and human papillomavirus (HPV) testing are a few common cervical cancer screening techniques available to HIV-positive women in resource-constrained countries. These techniques have not been contrasted against the gold standard of colposcopy-directed biopsies in HIV-positive women. [6].

MATERIAL AND METHODS

The study involved 70 women between the ages of 20 and 60. Following a cervical examination, all participants undergo a Pap smear test and visual inspection using the VIA method with acetic acid. 3% acetic acid solution was applied to the cervix for 30-60 seconds and observed under adequate lighting to conduct the VIA method. A positive result was noted if the cervix exhibits a whitening reaction (Aceto White) during the acetic acid observation test. The results of a pap smear test are reported according to the Bethesda system. A positive screening result leads to colposcopy and biopsy, the Gold Standard method. Biopsies are taken if a lesion is suspected or randomly from four cervical regions. Colposcopy determines if the test is considered negative or if further biopsy or endocervical curettage is required. Pathology analysis of the samples determines if the result is positive, indicating a CIN lesion or higher. A pathologist reviews all cytology, biopsy, and endocervical samples. The inclusion criteria for this study are sexually active and non-pregnant women with no current cervical disease, no history of cervical conization, cryo, or other invasive cervical cancer treatment, and no history of pre-invasive lesions or cervical cancer. The exclusion criteria were individuals who do not cooperate with other follow-up steps.

Statistical analysis:
After collecting data, frequency tables and statistical indices were mapped according to the background variables. Then, the diagnostic value indices including, Complaints of patients ,finding by speculum examination, positive and negative predictive values for the results of VIA, Pap smear and combination of these two test were analyzed by SPSS. The level of significance was lower than 0.05.

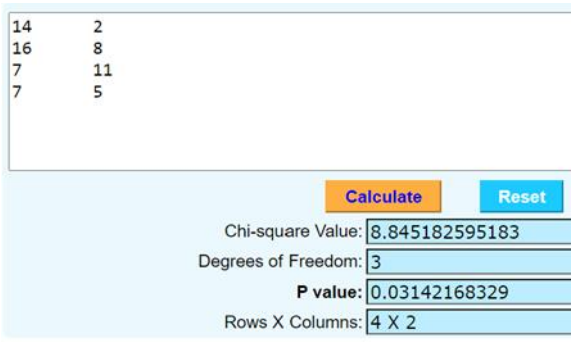
RESULTS

Table 1 displays the results of visual inspections using acetic acid across different age groups, categorizing cases as either normal or positive. The distribution of results is as follows: for the 20-30 years age group, there are 14 normal and 2 positive results; for the 30-40 years age group, 16 normal and 8 positives; for the 40-50 years age group, 7 normal and 11 positives; and for the 50-60 years age group, 7 normal and 5 positives. These results suggest that the proportion of positive outcomes increases with age, highlighting a significant relationship between age and the likelihood of a positive visual inspection result using acetic acid.

Table 1: Age wise distribution of visual inspection using acetic acid

Age	No. cases	Normal (acetic acid)	Positive (acetic acid)	Chi squared test
20 – 30	16	14	2	
30 - 40	24	16	8	8.845
40 – 50	18	7	11	0.0314
50 - 60	12	7	5	s
Total	70	44	26	

S: Significant (p value <0.05)
NS: Non-significant (p value > 0.05)



Chi-Square Test Introduction

Table 2 provides the distribution of results by age group: for ages 20-30, there are 5 normal and 11 positive results; for 30-40 years, 6 normal and 18 positive results; for 40-50 years, 2 normal and 16 positive results; and for 50-60 years, 5 normal and 7 positive results. Despite these variations, the overall Chi-squared test indicates that these differences are not statistically significant. Thus, according to this analysis, age does not appear to be a determinant factor in the likelihood of having a positive Pap smear result.

Table 2: Age wise distribution of pap smear test

Age	No . cases	Normal (pap smear)	Positive (pap smear)	Chi squared test
20 – 30	16	5	11	
30 – 40	24	6	18	3.871
40 – 50	18	2	16	0.275
50 – 60	12	5	7	NS
Total	70	11	52	

S: Significant (p value <0.05)
NS. Non-significant (p value > 0.05)

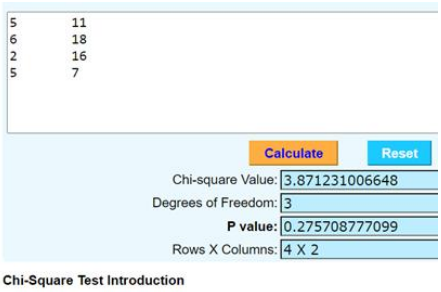


Table 3 shows that the total number of complaints for each age group is relatively balanced, with no single age group displaying a significantly higher or lower prevalence of complaints compared to others. The results imply that age may not be a major factor influencing the occurrence of these complaints among patients.

Table 3: Complaints of patients

Age	Vaginal discharge	Postcoital bleeding	Intermenstrual bleeding	Past menopausal bleeding	Chi squared test
20 – 30	10	1	1	1	5.8909 0.7507 NS
30 – 40	20	3	2	3	
40 – 50	12	2	2	2	
50 – 60	5	4	1	1	
Total	42	10	6	7	

S: Significant (p value <0.05)
NS: Non-significant (p value > 0.05)

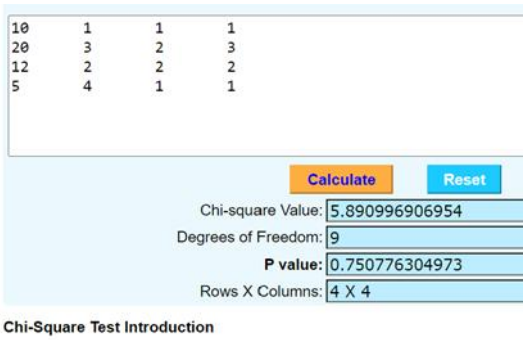


Table 4 provides an overview of findings from speculum examinations across different age groups. The data shows that the total number of cases with normal findings, cervical erosion, and chronic cervicitis is fairly consistent across age groups. Specifically, the age group 30-40 years has the highest number of cases with cervical erosion and chronic cervicitis, but these differences are not statistically significant when compared to the other age groups. Overall, the findings suggest that age does not significantly influence the likelihood of normal findings, or the presence of cervical abnormalities as detected by speculum examination.

Table 4: Finding by speculum examination

Age	Normal	cervical erosion	Chronic cervicitis	Chi squared test
20 – 30	**2**	**7**	**5**	**3.4678** **0.7482** **NS**
30 – 40	**7**	**10**	**13**	
40 – 50	**4**	**3**	**8**	
50 – 60	**2**	**5**	**4**	
Total	**15**	**25**	**30**	

S: Significant (p value <0.05)
NS: Non-significant (p value > 0.05)

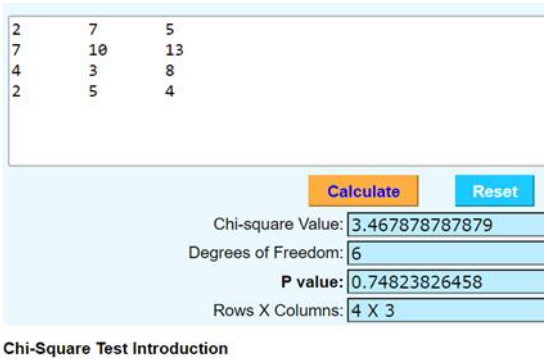


Figure 4: Finding by speculum examination

DISCUSSION

Cervical cancer is the most common type of gynecological cancer. Indeed, it is one of the major public health problems in the world and one of the top causes for disability-adjusted life-years [10]. Cervical cancer continues to be a major public health problem, where 70% of the affected patients present late and, also, because screening programs have not been effective in detecting preinvasive lesions and early cancer [13]. In this study, all women regardless of screening test underwent colposcopy and biopsy. Evaluation of screening tests in different settings is important because the results of these tests are valuable for screening policies [2]. These studies have shown that VIA is an adequate and acceptable screening method for cervical cancer. Furthermore, in low-resource areas, VIA can be better than PAP smears for its ease of use and low cost [7]. Visual inspection with acetic acid was abnormal in (26) women.[11] They aimed to evaluate the test parameters of VIA [12]. Seventy women underwent both tests. Which showed that (26) of screened women were positive when screened by VIA [8]. It was noted that (52) of Pap smear was abnormal in this study which was close to study [9].VIA-positive cases were limited to those with clear, well-defined, dense (oyster white or opaque/dull) The acetowhite may or may not have elevated edges that contact the squamocolumnar junction. Therefore, cases with a weak acetowhite region or a poorly defined border reaching the squamocolumnar junction were deemed negative VIA test cases, which increased the test's specificity and decreased its sensitivity. We can conclude that the VIA test has comparable results to the PAP test and can be used as an alternative primary test to screen for premalignant cervical lesions of the cervix, especially in poor developing countries, because the results of the comparison of the sensitivity, specificity, positive predictive value, negative predictive value, and accuracy of the two tests showed no significant differences[14].

CONCLUSION

Cervical cancer is the fourth most common cancer in women worldwide, with approximately 530,000 cases per year [11]. The Pap test had low sensitivity but high specificity, whereas VIA had a high sensitivity in addition to being easy and low-cost. Adjuvant methods of screening such as VIA can be a valuable alternative to the Pap test for cervical cancer screening in low-resource settings[5].

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