



COMPARATIVE EVALUATION OF VISUAL INSPECTION WITH ACETIC ACID AND PAP SMEAR FOR SCREENING OF CERVICAL CANCER

Obstetrics & Gynecology

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ABSTRACT

Objective: To compare the efficacy of VIA and PAP smear as a screening method for diagnosis of premalignant lesions of cervix in high risk patient in relation to colposcopic examination.

Material & Methods: This Prospective comparative analytical study was conducted in the department of Obstetrics and Gynecology at a tertiary care hospital. Our study included 100 high risk women attending obstetrics and gynaecology out patient department full-filling the inclusion and exclusion criterions. General, systemic and gynaecological examination was done and information was filled in pretested proforma. Pap smear was taken, prepared Pap smear slides were fixed in 95% ethyl alcohol and ether and sent for staining and cytological examination by expert cytopathologist. Then patients were subjected for visual inspection of cervix with 5% acetic acid followed by examination with colposcopy. Sensitivity, specificity, positive predictive value, negative predictive value and accuracy were calculated for VIA, Pap smear with colposcopy and Chi square test was applied to compare the diagnostic efficacy of the tests.

Result: VIA was proved to be the better test for identification of premalignant lesion of cervix, as it had a very high sensitivity.

KEYWORDS

VIA, PAP smear, Cervical cancer

INTRODUCTION

Cancer of the cervix, a potentially preventable disease and fourth most frequent cancer in women of all female cancers. It is the commonest cause of cancer deaths among women and most common malignancy of the female genital tract in the developing countries. Disparities of health and poverty play a major role in this high mortality rate. In contrast to the developed countries, cervical cancer is a public health problem in developing countries like India. India alone accounts for one-quarter of the worldwide burden of cervical cancers. (1),(2),(3) It is worrisome as all sexually active women are at risk for the development of cervical cancer.

Sexually transmitted Human Papilloma Virus (HPV) infection leads to the development of cervical intraepithelial neoplasia (CIN) and cervical cancer. Women with multiple sexual partners are at risk of developing the disease. Early detection and prompt treatment of precancerous conditions provide the best possible protection against cancer.(4) In developed countries with well-established screening programs, the incidences of cervical cancer have been reduced by 70-90%. The different methods of cervical cancer screening include Papanicolaou (Pap) smear, visual inspection of the cervix with acetic acid (VIA), HPV DNA test, and colposcopy. (5) Colposcopy is not used as a primary screening test but it is combined with other tests. All these techniques have their own merits and demerits.

In developing countries like India, high burden of cervical cancer is due both to a high prevalence of HPV infection and the lack of effective cervical cancer screening programmes. An important strategy towards the reduction of the incidence and mortality associated with cervical cancer is by increasing the screening rate of women who have not screened or those who screen infrequently.

So the Present study was aimed to compare the efficacy of VIA and PAP smear as a screening method for diagnosis of premalignant lesions of cervix in high risk patient in relation to colposcopic examination and to study the efficacy of VIA as a primary screening test for detection of premalignant lesions of cervical cancer.

MATERIAL AND METHODS:

Study Design - This Prospective comparative analytical study was conducted in the department of Obstetrics and Gynecology at a tertiary care hospital for a period of 18 months- from 1st November 2017 to 30th April 2019. Women with unhealthy cervix attending outpatient department in the department of Obstetrics and Gynecology at a tertiary care hospital were included.

Inclusion Criteria - Women In Age Group 21-65 Years With :

1.Postmenopausal bleeding. 2.Intermenstrual spotting 3.Postcoital bleeding 4.Early sexual exposure 5. Women with clinically unhealthy cervix 6. Persistent vaginal discharge. 7. Cervical erosion or ulceration 8. Unexplained occasional foul smelling discharge per vaginum. 9. Cervix bleed on touch.10. Hypertrophied cervix.

Exclusion Criteria:-

1. Women <21 year and > 65 years 2. Patient who had undergone recent endometrial curettage, hysterosalpingography, cervical biopsy or hysterectomy. 3. Pregnant or postpartum women 4. Patient having any history of treatment for either cervical dysplasia or vulval warts. 5. Immunocompromised patients. 6. Women with frank invasive cancer

Sample Size And Data Collection:

Before commencement of the study, informed consent was taken from the patients of the study sample. The study was initiated only after obtaining the approval from Institutional Ethics Committee (IEC). 100 high risk women attending obstetrics and gynaecology out patient department full-filling the inclusion and exclusion criterions who were willing to participate and gave written informed consent were enrolled in the study. General, systemic and gynaecological examination was done and information was filled in pretested proforma. Pap smear was taken, prepared Pap smear slides were fixed in 95% ethyl alcohol and ether and sent for staining and cytological examination by expert cytopathologist. Slides were stained with modified Papanicolaou staining method and examined under light microscope. Cytological interpretation of the smears were made according to the Bethesda system 2014. Then patients were subjected for visual inspection of cervix with 5% acetic acid followed by examination with colposcopy.

Statistical Analysis:

Statistical analysis was performed by using Graph Pad Prism software. Results were compiled and analysed. Sensitivity, specificity, positive predictive value, negative predictive value and accuracy were calculated for VIA, Pap smear with colposcopy. Chi square test was applied to compare the diagnostic efficacy of the tests.

RESULTS –

Table 1: Age-wise Distribution Of The Study Population

AGE (YEARS)	NO. OF CASES (n)	PERCENTAGE (%)
21-30	13	13%
31-40	38	38%
41-50	35	35%

51-60	11	11%
> 60	3	3%
TOTAL	100	100%

- Maximum number of cases were found in the age group 31-40 years forming 38 % total study population.
- Second commonest age group was 41-50 years which constituted 35 % of total study population.
- Mean age of the study population was 40.94 years.

Table 2: Distribution Of Study Population As Per Visual Inspection Of Acetic Acid (VIA) Result

VIA	NO. OF CASES (n)	PERCENTAGE (%)
VIA POSITIVE	78	78%
VIA NEGATIVE	22	22%
TOTAL	100	100%

- 78% of the cases showed positive results on examination with VIA (visual inspection with acetic acid).
- 22% cases were negative on examination with VIA.

Table 3: Distribution Of Study Population As Per PAP Smear Results

PAP SMEAR FINDING	NO. OF CASES (n)	PERCENTAGE OF CASES (%)
NORMAL	31	31%
INFLAMMATORY	31	31%
ASCUS	0	0%
AGUS	0	0%
ASCUS-H	0	0%
LSIL	20	20%
HSIL	18	18%
TOTAL	100	100%

- 31% of the cases were normal on PAP smear evaluation and another 31% showed inflammatory smear.
- 38% cases were having abnormal PAP smear, of which 20% cases were having report suggestive of LSIL, and 18% of the cases were having reports suggestive of HSIL.

Table 4: Distribution Of Study Population As Per Colposcopy Result

COLPOSCOPY RESULT	NO. OF CASES (n)	PERCENTAGE (%)
NORMAL	46	46%
CIN I	28	28%
CIN II	15	15%
CIN III	11	11%
TOTAL	100	100%

- 46% of the cases showed normal results on colposcopic examination.
- 28% cases had CIN I lesion.
- 15% of the cases were having CIN II lesion while 11% of the cases were having CIN III lesion on colposcopic examination.

Table 5: Correlation Between VIA And Colposcopy Results In Study Population

COLPOSCOPY ➡ VIA ↓	NORMAL	CIN I	CIN II	CIN III	TOTAL
POSITIVE	27	27	14	10	78
NEGATIVE	19	1	1	1	22
TOTAL	46	28	15	11	100

- VIA was positive in 78 cases out of which 51 (65.38%) cases were diagnosed premalignant lesions on colposcopy.
- Colposcopy was abnormal in 54 cases out of which 51 (94.44%) cases were VIA positive whereas VIA failed to diagnose 3 (5.56%) cases which were premalignant on colposcopy.

Table 6: Correlation Between PAP Smear And Colposcopy Results In Study Population

COLPOSCOPY ➡ PAP ↓	NORMAL	CIN I	CIN II	CIN III	TOTAL
NORMAL (31)	20	9	2	0	31
INFLAM. (31)	20	8	3	0	31

ASCUS	0	0	0	0	0
AGUS	0	0	0	0	0
ASCUS-H	0	0	0	0	0
LSIL (20)	4	9	3	4	20
HSIL (18)	2	2	7	7	18
TOTAL	46	28	15	11	100

- Pap smear was normal in 62 cases out of which 22 (35.48%) cases showed premalignant lesions on colposcopy.
- Out of 38 abnormal pap results, 32 cases (84.21%) were also abnormal on colposcopy and 6 (15.79%) cases were normal on colposcopy.
- Colposcopy was positive in 54 cases out of which 32 (59.26%) cases were diagnosed abnormal on Pap smear and 22 (40.74%) cases were normal on Pap smear.

Table 7: Analysis Of VIA Vs Colposcopy

COLPOSCOPY ➡ VS VIA ↓	POSITIVE	NEGATIVE	TOTAL	
POSITIVE	51	27	78	
NEGATIVE	3	19	22	
TOTAL	54	46	100	
SENSITIVITY	SPECIFICITY	PPV	NPV	ACCURACY
94.44%	41.30%	65.38%	86.36%	70%

Table 8: Analysis Of PAP vs Colposcopy

COLPOSCOPY ➡ VS PAP ↓		POSITIVE	NEGATIVE	TOTAL
POSITIVE		31	7	38
NEGATIVE		23	39	62
TOTAL		54	46	100
SENSITIVITY	SPECIFICITY	PPV	NPV	ACCURACY
57.41%	84.78%	81.58%	62.90%	70%

Table 9: Analysis Of Screening Tests In Relation To Colposcopy

TEST	SENSITIVITY	SPECIFICITY	PPV	NPV	ACCURACY
VIA	94.44%	41.30%	65.38%	86.36%	70%
PAP	57.41%	84.78%	81.58%	62.90%	70%
COLPOSCOPY	86.50%	76.92%	77.78%	86.96%	82%

DISCUSSION

The present study was an analytical study for evaluation of two diagnostic tests with sample size of 100 high risk women fulfilling inclusion and exclusion criteria.

The aim of the present study was to do a comparative analysis of VIA and Pap smear in relation to colposcopy for diagnosis of premalignant lesions of cervix and also to compare sensitivity, specificity, positive predictive value, negative predictive value and accuracy of VIA and Pap smear in relation to colposcopy for diagnosis of premalignant lesions of the cervix.

DISTRIBUTION OF STUDY POPULATION AS PER AGE GROUP-

In this study, majority of the cases were belonging to the age group 31-40 years i.e. 38% followed by 35% cases in the age group 41-50 years (Table 1). It was comparable with the studies done by Joshi et al and by P.S. Basu et al. In study done by Joshi et al, majority of the age group was between 41-50 years. (9) In study done by Hend S. Saleh, mean age of the study population was 36.2 years. (10) In a study done by Agrawal A et al. highest 43.6% population was from 31-40 years age group, followed by 36.4% in 20-30 year age group. (11)

VISUAL INSPECTION WITH ACETIC ACID-

In this study 78 (78%) of the study population had positive lesions on visual inspection with acetic acid. Out of 78 (78%) VIA positive cases, 51 cases (65.38%) were having premalignant lesions on colposcopic examination (true positive) and 27 cases (34.61%) were normal on colposcopic examination (false positive). 3 (13.63%) women who were negative on VIA examination had positive results for premalignant lesions on colposcopic examination (false negative). 19% women were negative on both examinations with VIA and colposcopy (true negative). (Table 5)

Sensitivity, specificity, positive predictive value, negative predictive

value and ac-curacy of VIA when compared with colposcopy was 94.44%, 41.30%, 65.38%, 86.36% and 70% respectively.(Table 7)

Results of this study were comparable with the studies done by Goel et al and by Hend S. Saleh. As VIA has very high NPV, which means that when the test is negative, the woman can go home reassured that she is not likely to have a premalignant cervical lesion.

In this study VIA test had a high sensitivity and low specificity probably because of some faint acetowhite lesion might have been labelled as positive and also because of infections and inflammations that might not have treated. In the present study, the results are in comparison with that of above-mentioned studies, suggesting that VIA may find a place as an alternative to Pap smear in low-resource technology and as an economic method of screening and picking up positive cases.(12)

• PAPSMEAR–

In the present study Pap smear test results were normal in 31 (31%) of the cases and was inflammatory in 31 (31%) cases.

Pap smear test was having abnormal cytology (LSIL+HSIL) in total 38 (38%) of the study population, of which 20 (52.63%) women were positive for LSIL and 18 (47.36%) were positive for HSIL lesion. (Table 3)

Out of 38 cases with abnormal cytology, 31 (81.57%) patients were also having premalignant lesion on colposcopy (true positive) and 7 cases (18.42%) were normal on colposcopic examination. Pap smear could not identify 23 patients, who were having premalignant lesions on colposcopy. (false negative) 39 patients were negative on both Pap smear and colposcopy (true negative). (Table 8)

Sensitivity, specificity, positive predictive value, negative predictive value and accuracy of Pap smear when compared with colposcopy as a gold standard was 57.41%, 84.78%, 81.78%, 62.90% and 70% respectively.

Results of the present study were comparable with the results of studies done by Joshi et al, and with Agrawal A et al. Results of these studies showed that Pap smear test has low sensitivity and moderate specificity for diagnosis if premalignant lesions of the cervix.(9,11) Hence it concluded that, VIA as compared to Pap smear can be better screening test due to its ease of use and low cost.

• COLPOSCOPY-

In the present study, 46 (46%) of the cases showed normal results on colposcopic examination. Out of 54 (54%) abnormal colposcopy results, 28 (51.85%) cases had CIN I lesion. 15 (27.77%) of the cases were having CIN II lesion while 11 (20.37%) of the cases were having CIN III lesion on colposcopic examination. (Table 4)

The performance and accuracy of colposcopy depends largely on the training, experience, and skills of the colposcopist. It has high negative predictive value and accuracy which makes colposcopy as a very good diagnostic tool for diagnosis of premalignant lesions.(Table 9)

So in the present study, VIA has high sensitivity and negative predictive value as compared to Pap smear test for diagnosis of premalignant lesions, which makes VIA a better screening test for diagnosis of the disease than Pap test.

Colposcopy has more sensitivity, negative predictive value and accuracy of all the screening tests which makes colposcopy as the best diagnostic tool for the disease. Colposcopy provides precise visual localisation of micropathological changes and site for subsequent histopathological diagnosis of early cervical disease. Hence, colposcopic assessment is a critical stage in diagnosis as well as in management of early cervical neoplasia.

CONCLUSION:

The present research work suggests that suggests that VIA may find a place as an alternative to Pap smear in low-resource technology and as an economic method of screening and picking up positive cases and colposcopy could be considered as a good diagnostic test for diagnosis of premalignant lesions of cervix.

LIMITATIONS:

The relatively small number of participants in the study may not fully

reflect the overall situation. So, further studies are necessary on large number of data.

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