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Original Research Article

Comparision of efficacy of visual inspection of cervix with acetic acid, Pap smear and colposcopy for prevention of cervical cancer

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ABSTRACT

Background: Cervical cancer is second most common cancer in women globally. Overall 80% cases occurs in developing countries. An important reason for the high incidence of cervical cancer in developing countries is the lack of effective screening programs to detect precancerous conditions and treat before it progresses to invasive cancer due to severe restrictions on the availability of infrastructure, resources and funding. Aim of this study was to compare the sensitivity, specificity, PPV, and NPV of VIA, Pap smear and colposcopy with colposcopic directed biopsy (as a gold standard).
Methods: This prospective analytical study was conducted on 200 women's (age>19 years) with abnormal cervix in the Department Of Obstetrics and Gynaecology, Government Medical College Kota from 1 august 2020 to 31 July 2022 who fulfil the Inclusion criteria. All the Symptomatic patients with symptoms like vaginal discharge postcoital bleeding, itching, and other gynaecological problems along with asymptomatic patients with accidental finding of bad cervix (cervical erosion).
Results: Maximum cases had common complaint of discharge per vaginum (60.55%), followed by post coital bleeding (11.5%). VIA when compared with HPR, had sensitivity 94.85% and specificity 74.76% and corresponding PPV 78% and NPV 94%. Paps smear when compared with HPR, the sensitivity was 62.89% and specificity was 89.32% and corresponding PPV 84.72% and NPV 71.88%. Colposcopy when compared with Histopathological report, the sensitivity was 70% and specificity was 91.26% and corresponding PPV 88.3% and NPV 76.4%.
Conclusions: Best result for early detection of pre-invasive lesions could be with combined use of Pap smear, VIA, colposcopy and colposcopy guided biopsy rather than any individual diagnostic procedure. It will immensely reduce the morbidity and mortality.

Keywords: Cervical cancer, Colposcopy, Pap smear, Sensitivity, Specificity

INTRODUCTION

Worldwide cervical cancer is the fourth most common cancer among women with an estimated 528000 new cases occurring annually and 275000 deaths each year. Overall 80% of cases occurs in developing countries.[1]

Factors like easy accessibility of cervix, propensity of cervical epithelial cell to exfoliate and their rapid turnover, evidence of a wide spectrum of histopathological changes ranging from mild atypia through nonmalignant lesion to frank malignancy and apparently prolonged natural history of disease provide the best potential for control of progression of cervical epithelial abnormality to frank carcinoma by selective screening of population. Various sophisticated methods, are available for screening the cervix for epithelial abnormalities, such as cytology, colposcopy and directed biopsy. Since early detection

predicts better prognosis, one of the most effective ways of preventing and controlling cervical cancer is regular screening. Well organized and well implemented cytology based screening programs have reduced mortality due to cancer cervix in the developed countries but however not feasible to implement in country like India, due to severe restrictions on the availability of infrastructure, recourses, and funding. Down-staging for the cancer is the method of screening in developing countries like India.[2]

METHODS

This prospective analytical study was conducted on 200 women's (age>19 years) with abnormal cervix in the department of obstetrics and gynaecology, government medical college Kota from 1 august 2020 to 31 July 2022 who fulfil the Inclusion criteria. All the Symptomatic patients with symptoms like vaginal discharge postcoital bleeding, itching, and other gynaecological problems along with asymptomatic patients with accidental finding of bad cervix (cervical erosion).

Inclusion criteria

Inclusion criteria were the suspicious symptoms like vaginal/clinical discharge, postcoital or intermenstrual bleeding and postmenopausal bleeding. Suspicious cervix such as hypertrophied, unhealthy, eroded, torn and/or bleeds on touch. Abnormal cytology report in apparently healthy cervix. Abnormal Pap smear report.

Exclusion criteria

Exclusion criteria were pregnancy, vaginitis, patient on intravaginal medication, patient in menses, post hysterectomy, obvious cervical growth at the time of examination, post radiation.

RESULTS

In our study oldest patient reported was of 72 yrs and youngest was of 19 yrs. The mean age of overall population in present study was (38.48±12.10) yrs. In the present series majority of cases belonged to age group of 31 to 40 yrs. Maximum number of VIA +ve, Paps smear and colposcopy +ve were seen in 31 to 40 yrs of age (Table 1).

Table 1: Age wise distribution.

Age (in yrs)	P/S	VIA	Paps smear	Colposcopy
20-30	42	23	19	11
31-40	85	51	23	29
41-50	36	22	15	22
51-60	27	16	11	9
>60	10	6	4	6
Total	200	118	72	77

In present study mean parity was found as 3.14±1.4 yrs. It is evident from above table that maximum no. of VIA positive 39 (70.90%), Paps Smear 25 (45.45%) and Colposcopy 26 (47.27%) were seen in women parity =3 (Table 2).

Table 2: Distribution of cases according to parity.

Parity	P/S	VIA	Paps smear	Colposcopy
P0	5	1	0	0
P1	24	10	5	8
P2	46	18	12	15
P3	55	39	25	26
P4	45	33	18	17
P5 and above	25	17	12	11
Total	200	118	72	77

It is evident from above table that most common finding on per speculum was normal looking cervix 92 (46%) and the most common abnormality detected was erosions 64 (32%) followed by hypertrophied cervix 28 (14%) (Table 3).

Table 3: Findings on per speculum examination.

Finding	No. of patients	Percentage (%)
Normal cervix	92	46
Erosions	64	32
Hypertrophied	28	14
Torn cervix	10	5
Bleeds on touch	6	3

It is evident from above table that most common complaint was discharge per vaginum, 121 (60.5%) followed by post coital bleeding (11.5%) (Table 4).

Table 4: Association with various clinical complaints.

Complaints	Total no. of cases	% Age
Discharge per vaginum	121	60.5
Pain abdomen	18	9
Itching in private parts	3	1.5
Menstrual irregularities	11	5.5
Post coital bleeding	23	11.5
Post-menopausal bleeding	15	7.5
Asymptomatic	9	4.5
Total	200	100

In the present study Pap smear was positive (ASCUS or worse) in 72 cases (36%). It was normal in 16(8%) women and inflammation in 112 (56%) women (Table 5).

Out of all the 200 women who underwent colposcopic examination, 77 (38.5%) were positive (CIN 1 or above). Thirty one had normal colposcopy while 79 (39.5%) had

chronic cervicitis and 13 had unsatisfactory colposcopy (Table 6).

Table 5: Paps smear findings.

Paps smear	No. of patients	Percentage (%)
Normal	16	8
Inflammation	112	56
ASCUS	20	10
LSIL	28	14
HSIL	21	10.5
Invasive	3	1.5
Total	200	100

Table 6: Colposcopic findings.

Colposcopy finding	No. of patients	Percentage (%)
Normal	31	15.5
Unsatisfactory	13	6.5
Chronic cervicitis	79	39.5
CIN-I	39	19.5
CIN-II	25	12.5
CIN-III	10	5
Invasive carcinoma	3	1.5
Total	200	100

In present study, the sensitivity and specificity were 94.85% and 74.77%, positive predictive value 77.97% and negative predictive value 93.9% in VIA positive cases on subjecting to biopsy (Table 7).

Table 7: Correlation between VIA and cervical biopsy.

VIA	Total No. of cases	Biopsy	
		Positive	**Negative**
VIA positive	118	92	26
VIA negative	82	5	77
Total	200	97	103

X^2=100.04, p <0.0001-statistically significant

Table 8: Correlation between Paps smear and cervical biopsy.

Paps smear	Total no. of cases	Biopsy	
		Positive	**Negative**
Paps smear positive	72	61	11
Paps smear negative	128	36	92
Total	200	97	103

X^2=59.0954, p<0.00001-statistically significant

In present study, the sensitivity and specificity were 62.89% and 89.32% respectively and positive predictive value 84.72% and negative predictive value 71.88% in Paps smear positive cases on subjecting to biopsy (Table 8).

In present study, the sensitivity and specificity were 70.10% and 91.26% respectively and positive predictive value 88.31% and negative predictive value 76.42% in Colposcopy positive cases on subjecting to biopsy (Table 9).

Table 9: Correlation between colposcopy and cervical biopsy.

Colposcopy	Total no. of cases	Biopsy	
		Positive	**Negative**
Colposcopy positive	77	68	9
Colposcopy negative	123	29	94
Total	200	97	103

X^2=79.4489, p <0.00001-statistically significant

DISCUSSION

Influence of age

In present study, mean age of women was 38.48±12.10 years comparable to 38.2 years Singh et al (2010).[3] In a study by Bharti et al at Indore, the mean age of women was 39.93 years.[4] Incidence of cervical cancer low in women under age of 24 years, but the incidence increases aged 35-40 and reaches a maximum in forties and fifties years of age.

Impact of parity on cervical lesion

In present study, mean parity found to be 3.14±1.4 years comparable to Were et al (2010).[5] In present study in parity ≥3 maximum number of VIA positive were 89 (71.2%), Paps smear +ve 55(44%) and colposcopy positive 54 (43.2%), out of those 64(65.97%) cases had dysplasia and invasive cancer. Out of 75 cases who were nulli to second para only 29 (38.6%) VIA positive, Paps positive 17(26.6%) and 23 (30.6%) colposcopy positive, out of that 33 (34.02 %) had dysplasia. This may be due to increase trauma to the cervix as parity increases. Melissa et al conducted that >3 vaginal deliveries were associated with higher risk of CIN II and III.[6]

Association with various clinical complaints

In present study discharge per vaginum was most common complaint in 121 (60.5%) women. Second most common presenting complaint was post coital bleeding in 23(11.5%) cases followed by pain abdomen in 9% and Post-menopausal bleeding in 15 (7.5%). In the study by Bhatla et al, the presenting complaint was vaginal discharge in 80% cases, irregular vaginal bleeding in 30.0% cases and post coital bleeding in one woman.[8] Similarly in Patiala study by Sareen et al, leucorrhoea was the commonest overall complaint.[8]

Distribution of cases according to finding on per speculum examination

In this study, the commonest finding on per speculum examination was a normal looking cervix (seen in 92/200; 46%) and the most common abnormality was erosion (seen in 64/200; 32%) and second most common was hypertrophied cervix (28/200; 14%).

In study by Ghosh et al, the most common finding was a normal looking cervix (44%) and the most common abnormality was an ectopy (25.4%).[9] According to study by Khan et al found cervix to be healthy in 39.3% and unhealthy in 60.7%.[10] Patil et al found that out of the total study population (200), 112 (56%) has suspicious looking cervix which is at par to our study.[11]

Distribution of cases according to Paps smear findings

In the present study out of 72 (36%) paps smear positive cases 20 (10%) were ASCUS, 28(14%) were LSIL, 21(10.5%) were HSIL and 3 (1.5%) were invasive carcinoma. In a study conducted by Patil et al, among the 36 women with abnormal Paps smear, there were 19 LSIL, 15 HSIL, 1 case of Invasive Ca and 1 case of AGUS.[11] In study by Krishengowda et al, out of 100 women, LSIL 8%, HSIL 9% and Invasive Ca were in 2% patients, while Inflammation was found in 68% cases.[12]

According to study by Ghosh et al, Paps smear was positive in 13 cases, including 10 cases of LSIL and 3 cases of HSIL, while 38 cases were reported as inflammatory smears.[9]

Distribution of cases according to colposcopy findings

All the 200 women who underwent colposcopic examination, out of them 77 (38.5%) were positive (CIN 1 or above). Amongst them 39 were CIN 1, 25 were CIN 2, 10 CIN 3 and 3 cases were invasive carcinoma. Chronic cervicitis was found in 39.5% and in 6.5% colposcopy was unsatisfactory. In a study by Patil et al, out of 200, 70 were found to have positive results. Among them 33 LSIL, 33 HSIL and 4 cases of invasive carcinoma.[11]

Colposcopically, 130 (65%) had abnormal finding, LSIL was in 30 (15%) cases, HSIL in 15(7.5%), CIS in 10 (5%) and invasive carcinoma in 3 (1.5%) by Rageshwar et al.[13]

Correlation between VIA positivity and cervical biopsy for pre-invasive and invasive lesion

In present study sensitivity of VIA was 94.85% and specificity 74.75%, positive predictive value 78% and negative predictive value 94%. On applying chai square test between VIA positive and cervical biopsy correlation was statistically significant.

Table 10: Comparison of sensitivity, specificity, positive predictive value and negative predictive value of VIA in various studies.

Name of study	Year	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
Ghosh et al[9]	2012	89.5	91.2	36.9	99.3
Singh et al[3]	2010	93.1	86.6	22.1	99.0
Patil at el[11]	2011	86.95	72.51	62.5	91.34
Rana et al[14]	2010	93.0	90.0	62.5	98.0

Table 11: Correlation b/w Paps smear and cervical biopsy for preinvasive and invasive lesion.

	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
Patil et al[11]	37.68	92.36	72.22	73.78
Singh et al[3]	70.02	97.02	51.2	97
Sankarnarayan[15]	62	90	25	97
Jyothi[13]	65.2	96.3	89.3	-

Table 12: Correlation b/w colposcopy and cervical biopsy for preinvasive and invasive lesion.

	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
Ghosh et al[9]	84.2	97.8	66.6	99.1
Patil et al[11]	94.2	94.65	90.27	96.87
Pretorius et a1[16]	62.4	93.7	-	-

The present study showed that sensitivity of Paps smear was 62.89% and specificity 89.32%, PPV 84.72% and NPV 71.88% (Table 10).

From the above mentioned Indian studies the sensitivity of Pap smear ranges from 37.68-70%. The sensitivity of Paps smear has been found to be lower in developing countries probably due to large percentage of inflammatory smear

which may mask mild dysplasia and the technique chosen for Pap smear (Table 11).

In the present study, sensitivity of colposcopy was 70.10% and specificity was 91.26%, PPV 88.31%, NPV 76.42% (Table 12).

In some studies by different colposcopists, false +ve results were high (8.74%). The major factor responsible for false +ve results include benign lesion of the cervix example, syphilitic ulcer, benign granulomatous lesion in which colposcopic differentiation from a malignant lesion is difficult and sometimes impossible. These lesions may represent epithelium with potential risk of malignancy and requires careful observations and follow ups for the possible SIL or carcinoma in situ in the future.[17,10]

This study has several limitation. Rural patients screening was difficult as rural patients did not much aware about screening. For this screening a well trained staff and well equipped centre are required

CONCLUSION

Best result for early detection of pre-invasive lesions could be with combined use of Pap smear, VIA, Colposcopy and Colposcopic guided biopsy rather than any individual diagnostic procedure. It will immensely reduce the morbidity and mortality. Colposcopy and Cervical biopsy need skill and can be done at high resource setting and Colposcopy gold standard for CIN. As majority of women in India belong to low socioeconomic, rural area low education level screening with per speculum and VIA would help in early detection of preinvasion lesion.

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