

A Prospective Study of Women to Establish a Link Between Pap Smear and Colposcopy Findings in Relation to Histopathological Findings

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Abstract

Aim: To evaluate the correlation of Pap smear and Colposcopic findings in relation to histopathological findings among sexually active women. **Methods:** The present prospective cross-sectional study was carried out in the department of Obstetrics and Gynaecology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India for 1 year. 100 women between 20-60 years of age with H/o abnormal vaginal discharge, pain abdomen and unhealthy cervix were included in this study. After detailed history and examination, Pap smear was taken and Colposcopic examination was done using Colposcope model 150 FC with magnification between 10X to 12.5X followed by Colposcopy guided biopsy. **Results:** Out of 100, 40% of cases were in 30-40 years age group followed in order by 20-30 years (25%), 40-50 years (18%) and 50-60 years (17%). Majority were (52%) multiparous (Para 3 or more) and 35% with para 2 and 13% with para 1. White discharge associated with unhealthy cervix and H/o contact bleeding was the most common clinical symptom (62%) among the cases and others were low backache (19%), pain abdomen (11%) and menstrual disorders (13%). Pap smears were stained and examined, and the findings were recorded as NILM with 67%, ASCUS (Atypical squamous cells of undermined significance) with 13%, LSIL (Low grade squamous intra epithelial lesion) with 10%, HSIL with 6% and carcinoma as 4%. Colposcopic findings were reported as benign inflammatory (RCI:0-2, 60%), low grade (RCI:3-5, 21%), high grade (RCI:6-8, 13%) and carcinoma (RCI:>8,6%). Histopathology reports showed that 56% of study cases had chronic cervicitis with or without metaplasia, 19% with CIN1, 15% with CIN2 and CIN3 and 10% with carcinomas. **Conclusion:** The result on current study give support to the fact that Pap smear is an easy screening tool to identify premalignant and malignant lesions of cervix early in the stage of disease and Colposcopy shows the exact site for biopsy for histopathological diagnosis and for further management. Colposcopy and cytology are not competitive method, but complementary to each other.

Keywords: Pap Smear, Colposcopic Examination, Histopathological, Premalignant and Malignant Lesions.

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Introduction

Cancer of cervix is one of the most common gynaecological malignancy in women in India (80%). Cervical carcinoma still constitutes a great clinical and social problem. The tragedy is worse due to lack of facilities for early detection. Cases are detected late when they are incurable. This results in very high morbidity and mortality. Cancer cervix has been considered preventable because it has a long pre-invasive state and availability of screening programs and treatment of preinvasive lesion is effective[1]. The main cause of cervical cancer is infection by HPV transmitted sexually[2]. The worldwide prevalence of HPV in cervical cancer is 99.7%[3]. It has been well-established that well-organized screening by conventional cytology has substantially reduced the incidence of morbidity and mortality from cervical cancer in developed countries[1]. In developed countries such as the USA, 85% of women had at least one Papanicolaou (Pap smear) test through their lifetime, but this rate is only 5% in the developing countries[4]. The long pre-invasive state of carcinoma of cervix and the availability of treatment options for it make the disease ideal for screening procedures[1]. The Pap smear is a simple, safe, non-invasive and effective method for detection of noncancerous and precancerous changes in the cervix and vagina[5]. In 1925, Hinselman first hypothesized visualization of cervical epithelium under the magnification. Colposcopy provides a unique method to study the benign and premalignant lesions[5]. It is a simple non-invasive in vivo examination of cervix with a binocular microscope, the Colposcope which helps in determining the location, size and extent of abnormal cervical lesions and serves for detecting the site for biopsies. Cytology (Pap smear) is the lab

method while the colposcopy is the clinical method of detection[6]. The final diagnosis must be made on histopathological examination[6]. Pap smears were interpreted according to The New Bethesda System 2014.⁷Colposcopy reporting will be according to the Reid's Colposcopic index (RCI). Histopathological slides were interpreted according to the WHO classification[8].

The aim of this study was to find a correlation of Pap smear and Colposcopy in detecting the premalignant and malignant lesions of the cervix with histopathological findings.

Material and methods

The present prospective cross-sectional study was carried in the department of Obstetrics and Gynaecology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India for 1 year after taking the approval of the protocol review committee and institutional ethics committee.

Methodology

The study population in the present study included women aged between 20-60 years of age attending the Gynaecology OPD with clinical history and symptoms suggestive of cervical involvement. A thorough history taking, and pelvic examination was done with the help of a speculum and subjects with an unhealthy cervix i.e., erosion of cervix, inflammatory cervix etc. were included in the study. The socio-demographic data including age, parity, age at marriage, socio economic status was noted in a separate predesigned questionnaire sheet.

Inclusion criteria

- Sexually active women of age group 20-60 years

- Patients with unhealthy cervix - erosion, chronic cervicitis, healed lacerations hypertrophied cervix, bleeding on touch
- suspicious growth/ulcer/polyp
- abnormal discharge

Exclusion criteria

- Frank carcinoma cervix
- Pregnant females
- Patients with bleeding per-vaginum at time of examination
- Those who had used vaginal medications, vaginal contraceptives or douches in the last 48 hours of examination.
- Women >60 year and <20 years

Collection of Material

Pap smear was taken using Ayer's spatula and the scrapings were fixed by dipping the slide in a jar containing 95% ethyl alcohol and ether. Pap smears were examined by a pathologist and scored based on Revised Bethesda scoring system[9]. Colposcopic examination was done using Colposcope model 150FC with magnification between 10X to 12.5X.

Examination of cervix was done with green filter for vasculature. Then 5% acetic acid was applied to cervix and Colposcopic evaluation done at 1min, and 5 min followed by application of lugol's iodine. Colposcopically directed biopsy was taken from areas with abnormal

vasculature, abnormalities like punctuations, mosaic pattern, raised edges, cotton wool appearances, iodine negative areas abutting transformation zone. ECC was done in indicated cases and all specimens were subjected to histopathological examination. Findings on Colposcopic examination findings were recorded according to Reid's Colposcopic Index[10].

Colposcopic biopsies were stained by hematoxylin and eosin. Findings of the slides were categorized as chronic cervicitis, cervical intraepithelial neoplasia I, II and III, squamous cell carcinoma and adenocarcinoma according to WHO.

Statistical analysis

The data was entered in a Microsoft excel spread sheet and checked for any corrections. Sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) was calculated.

Results

In the present prospective study, a total of 100 cases were enrolled based on the inclusion and exclusion criteria. 40% of cases were in 30-40 years age group followed in order by 20-30 years (25%), 40-50 years (18%) and 50-60 years (17%). Majority were (52%) multiparous (Para 3 or more) and 35% with para 2 and 13% with para 1 (Table 1).

Table 1: Demographic profile of the patients

Age in years	No. of cases	%
20-30	25	25
30-40	40	40
40-50	18	18
50-60	17	17
Parity		
Para 1	13	13
Para 2	35	35
Para 3 and more	52	52

Abnormal discharge in association with unhealthy cervix and postcoital bleeding was the most common clinical symptom (62%) among the cases and others were low backache (19%), pain abdomen (11%) and menstrual disorders (13%) (Table 2).

Table2: Distribution of cases based on symptoms

Presenting symptoms	No of cases	%
Abnormal discharge	62	62
Pain abdomen	11	11
Low backache	19	19
Menstrual disorders	13	13
Total	100	100

Table3: Distribution of Colposcopic findings

Reid Colposcopic score	No of cases	%
0-2(Benign Inflammatory)	60	60
3-5(Low grade)	21	21
6-8(high grade)	13	13
>8carcinoma	6	6
Total	100	100

All the cases were examined by Colposcope and graded as per Reid Colposcopic score as benign inflammatory (Score 0-2), low grade (score 3-5), high grade (Score 6-8) and if >8 considered as carcinoma. Based on the scoring system, majority were benign inflammatory (60%), low grade (21%), high grade (13%) and 6% as carcinoma (Table3). Pap smears were reported according to Bethesda as NILM (Negative for intraepithelial lesion

or malignancy) in 67%, ASCUS (Atypical squamous cells of undermined significance) in 13%, LSIL (Low grade squamous intra epithelial lesion) in 10%, HSIL (High grade squamous intra epithelial lesion) in 6% and carcinoma in 4% (Table 4). Table 5 summarizes histopathological findings being reported as 56% with chronic cervicitis with or without metaplasia, 19% as CIN1, 15% as CIN2 and CIN3 and 10% as carcinomas.

Table 4: Distribution of various grades of cytology (Pap smear).

Cytology findings	No of cases	%
NILM	67	67
ASCUS	13	13
LSIL	10	10
HSIL	6	6
Carcinoma	4	4
Total	100	100

Table 5: Distribution of various grades of histopathology

Histopathological finding	No of cases	%
Chronic cervicitis	56	56
CIN 1	19	19
CIN2 and CIN3	15	15
Carcinoma	10	10
Total	100	100

CIN: Cervical intraepithelial lesion

The overall sensitivity of Pap smear for detecting lesions above LSIL was 30%, specificity 99%, PPV was 93%, negative

predictive value 75% and accuracy of Pap smear in our study was 77%. Table 6 summarizes the correlation between Pap

smear and histopathological findings in our study.

Table 7 shows the correlation between colposcopic findings and histopathological findings of our study. In the present study, the sensitivity of colposcopy in detection of low-grade lesions and above came out to be 80%, specificity 82%, positive

predictive value 66%, negative predictive value 86% and accuracy of colposcopy in our study was 84%.

The incidence of pre-invasive lesions (LSIL (CIN1) and HSIL (CIN2, CIN3) was 34% with LSIL (CIN1-19%) and HSIL (CIN2, CIN3-15%). The incidence of invasive lesions in our study was 10%.

Table 6: Correlation between Pap smear report and histopathological report.

Pap Smear	Histopathological report				
	Chronic cervicitis	CIN1	CIN 2 and CIN3	Carcinoma	Total
NILM	49(49%)	10(10%)	5(5%)	3(3%)	67
ASC(US)	2(2%)	6(6%)	3(3%)	2(2%)	13
LSIL	4(4%)	2(2%)	2(2%)	2(2%)	10
HSIL	1(1%)		4(4%)	1(1%)	6
Carcinoma		1(1%)	1(1%)	2 (2)	4
Total	56(56%)	19(19%)	15(15%)	10(10%)	100

Table7: Correlation between Colposcopic findings and histopathological report.

Colposcopic finding	Histopathological report				
	Chronic cervicitis	CIN1	CIN2 and CIN3	Carcinoma	Total
Abnormal					
0-2 (Benign Inflammatory)	49(49%)	7 (7%)	4(4%)	0	60
3-5(Low grade)	6 (6%)	9(9%)	5(5%)	1(1%)	21
6-8(high grade)	1(1%)	3(3%)	6(6%)	3 (3%)	13
>8carcinoma				6(6%)	6
Total	56(56%)	19(19%)	15(15%)	10(10%)	100

Discussion

In the present study, 40% of cases were in 30-40 years’ age group followed in order by 20-30 years (25%), 40-50 years (18%) and 50-60 years (17%) indicating that premalignant lesions (dysplasia) precede the development of malignancy by a decade and prompt identification by appropriate screening technique reduces the morbidity and mortality associated with cervical cancer. Multiparous women were more common in our study (52%) supporting that woman with early sexual exposure in early life and more children are associated with more chance of abnormal findings in screening for cervical premalignant lesions. The mean parity of women in our study was 3 which is similar

to findings of Goel et al.[11] Abnormal colposcopic findings were more common in women with history of post coital bleeding, post-menopausal bleeding and abnormal discharge with unhealthy cervix which indicate that they are significant risk factors for malignancy of cervix. All these findings in our study correlates with the findings of Arora Retal[12].

Abnormal discharge per vaginum associated with unhealthy cervix was the most common symptom in our study (55%) as compared with the studies of Chaudhary RD et al.[13] Few studies reported post coital bleeding as one of the major complaint, which is contrary to the finding in our study, however the study group in that study was age group >60years.In the present study, Colposcopy

findings were graded as per Reid colposcopic score as, benign inflammatory (Score 0-2), low grade (score 3-5), high grade (Score 6-8) and if >8 considered as carcinoma. Based on the above scoring system, majority were benign inflammatory 60%, low grade lesions in 21%, high grade lesions in 13% and 6% as carcinoma. Findings of our study correlate with the findings of Krishnegowda and Veena[14]. Colposcope has the ability to localize and determine the extent of all lesions which will not be visible to the naked eye and can be detected in single setting. It also helps in determining the site of biopsy, patients for conservative treatment of CIN, follow up of intraepithelial neoplasia and invasive lesions. On Pap smear, Pap smears were stained and examined, and the findings were recorded as NILM (Negative for intraepithelial lesion or malignancy) in 67%, ASCUS (Atypical squamous cells of undermined significance) in 13%, LSIL (Low grade squamous intra epithelial lesion) in 10%, HSIL (High grade squamous intra epithelial lesion) in 6% and carcinoma in 4% of study population. Findings of our study coincide with the findings of Bal MS et al.[15] However findings in the study of Shastri SS et al, 95.4% were normal, 0.026% had LSIL, 0.01% has HSIL and 0.007% had invasive carcinoma[16]. These differences in Pap smear reporting's are due to differences in sampling, staining, fixation techniques and reporting errors.

On Histopathological examination, majority of the cases in the present study were found to be of chronic cervicitis with or without metaplasia (56%), CIN1 (19%), CIN2 and CIN3 (15%) and carcinomas (10%). Findings of our study coincide with the reports of Bodal and Brar who reported malignancy in 8.5% of cases in this study[17]. In the present study, overall sensitivity of Pap smear for detecting lesions above LSIL was 30% and accuracy was 77%. Findings of our study coincide with findings of Joshi et al who reported

the same with a sensitivity of 30%, PPV of 94% and accuracy of 79% in his study[18]. A few studies with different sample size, age group reported a sensitivity of up to 45%. In the present study, the sensitivity of Colposcopy in detection of low-grade lesions and above came out to be 80%, specificity 82%, positive predictive value 66%, negative predictive value 86% and accuracy of Colposcopy was 84%. Study by Ramesh G et al also reported the same in their study but our findings were contrary to the reports of Mallur PR et al who reported sensitivity of Colposcopy in detection of low-grade lesions as high as 90% and accuracy of 78% with specificity of 76% in their study[19,20].

Hence the present study strongly suggests that Colposcopy and Colposcopic directed biopsy of cervix should be included along with the Pap smear in screening of cases for early detection of cervical cancer as this increases the accuracy of detection of cervical abnormalities when used complementarily.

Conclusion

Cervical cancer is a preventable and curable malignancy if identified and managed early. Since early lesions of cervical cancer, i.e., CIN and early invasive stages are asymptomatic, regular screening as per protocol should be made mandatory and a best screening procedure to detect early lesions should be made available in low resource settings. In India, Pap smear still remains as the best screening tool because of low resources and settings. Our study indicates that colposcopy is more sensitive tool and Pap smear is more specific in identification of early lesions of the cervix. So, screening at low resource settings with Pap smear should be encouraged and if this is combined with colposcopy, it will increase the chances of identifying premalignant and malignant lesions of cervix.

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