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ORIGINAL RESEARCH

Correlation of pap smear and colposcopy with biopsy in abnormal cervical cytology

Dr. Bharti Maheshwari[1], Dr. Preeti Sharma[2], Dr. Vidushi Chauhan[3], Dr. Ruchi Karishma[4]

[1]Professor& Head, [2]Associate Professor, [3,4]Junior Resident, Department of Obstetrics & Gynecology, Muzaffarnagar Medical College & Hospital, Muzaffarnagar, Uttar Pradesh, India

Corresponding Author
Dr. Vidushi Chauhan
Junior Resident, Department of Obstetrics & Gynecology, Muzaffarnagar Medical College & Hospital, Muzaffarnagar, Uttar Pradesh, India
Email: vidushi.chauhan96@gmail.com

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ABSTRACT

Background: The most common cancer of the genital area among Indian women is cervical cancer. It accounts for 80% of all women with cervical cancer. Early detection of preinvasive disease and treatment of cervical intraepithelial neoplasia may improve patient outcomes. Cervical cancer is preventable due to its long preinvasive state, the anatomy of the cervix that allows re-examination, and the availability of good screening methods for preinvasive treatment of the disease. **Aim & Objectives:** To evaluate the relationship between Pap smear and colposcopy in the detection of cervical premalignant lesions and to investigate the role of colposcopy in the evaluation of abnormal cervical cytology and its relationship with cancer diagnosis. **Material and Methods:**80 women with abnormal pap smear participated in this hospital-based observational research which lasted for 12 months at Muzaffarnagar Medical College & Hospital in Muzaffarnagar, Uttar Pradesh. Chi square and t test were used in the statistical analysis of the data. **Results:**Mean age in our study was 41.7 years. Total 80 abnormal pap smear cases underwent into biopsy in which 40% ASCUS results into 17.5% nonspecific chronic cervicitis, 13.8% CIN I, 8.8% CIN II cases. 37.5% patient of LSIL results in to 17.5% nonspecific chronic cervicitis, 7.5% CIN I, 12.5% CIN II. 7.5% ASC-H cases results in 2.5% CIN I, 3.8% CIN III, 1.3% SCC. 15% HSIL results into 1.3% CIN II, 11.3% CIN III, 2.5% SCC. **Conclusion:** Colposcopy is better tool for the evaluation of women with abnormal Pap smears, unhealthy cervix, and seems to be more accurate in detecting CIN. Colposcopy eliminates the need for repeated follow up as in pap smear which has defined low sensitivity. Hence, colposcopy with biopsy should be incorporated in women with abnormal cervical cytology. Colposcopy using RCI (Reid Colposcopic index) has satisfactory diagnostic efficacy and the good correlation with histopathology makes it a valid tool in order to detect timely changes that precedes the cancer cervix.

Keywords: Pap smear, CIN, ASCUS.

INTRODUCTION

The most common cancer of the genital area among Indian women is cervical cancer (1). It accounts for 80% of all women with cervical cancer. Early detection of preinvasive disease and treatment of cervical intraepithelial neoplasia may improve patient outcomes. Cervical cancer is preventable due to its long preinvasive state, the anatomy of the cervix that allows re-examination, and the availability of good screening methods for preinvasive treatment of the disease (2). It turns out that the decline in cervical cancer cases in developing countries is the result of widespread screening.

There are now many types of cervical cancer tests and tests that require a lot of expertise, cost and time. These are visual examination with acetic acid (VIA) and visual examination with Lugol's iodine (VILI), PAP test, liquid-based cytology (LBC) and HPV DNA testing, colposcopy and histopathology.

PAP Smear is Cytological examination of exfoliated cell to detect dysplasia(3), Result of abnormal Pap smear include the following Atypical Squamous cells of undetermined significance (ASCUS), ACS-H(atypical squamous cell in which high grade lesion must not be excluded), low grade Squamous intraepithelial lesions (LSIL) and HSIL(high grade Squamous intraepithelial lesion) require further investigation like Colposcopy and Cervical Biopsy. Colposcopy involves examining the genital area with special attention to the epithelium and vascular structure of the stroma tissue. Reid and Scalzi proposed the Reid Colposcopy Index to reduce the learning curve of diagnostic colposcopy (4). According to REID SCORE, colposcopy is divided into CIN 1 [score 0-2], CIN 2 [score 3-4], CIN 3

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[score 5-8] (5). The diagnosis result of biopsies take were tagged as chronic cervicitis,CIN 1, CIN 2, CIN 3 and Squamous cell carcinoma (SCC)according to WHO. WHO promotes Screening strategy with cytology by PAP smear followed by colposcopic examination and directed biopsies.

AIM & OBJECTIVES

This study aims to evaluate the relationship between Pap smear and colposcopy in the detection of cervical premalignant lesions and to investigate the role of colposcopy in the evaluation of abnormal cervical cytology and its relationship with cancer diagnosis.

MATERIAL AND METHODS

This is a prospective clinical study of 80 women with abnormal pap smear report or bad cervix attending the Gynecology OPD of Muzaffarnagar medical college, Muzaffarnagar UP, after taking approval from the Ethical committee. Informed consent was taken from each woman. Relevant obstetrics & gynecology history was taken and recorded.

Inclusion criteria

- Women in age group between 20-60 years
- Women having symptoms like discharge from vagina, intermenstrual bleeding, postcoital bleeding,
- Women having clinically unhealthy Cervix on naked eye examination (erosion, simple leukoplakia, hypertrophied cervix,
- keratinisation, bleeding on touch ulcer)
- Women who underwent PAP smear testing, only those women who had abnormal cytology reports were included as further study subjects.
- Women who showed dysplasia on PAP smear report

Exclusion criteria

- Women with bleeding at the time of examination.
- Unsatisfactory smear for examination.
- Pregnant women.
- Women with hysterectomy
- Women with invasive cancer

Colposcopy was performed after the menstrual period for women whose Pap smear test report is abnormal. Woman underwent colposcopy on BORZE model DVC 14, 000 machine, equipped with green filter, TV camera and CTV monitor, focal length 25 mm, magnification 7.5 * 10 *, working distance 25 cm. Analyzed abnormal colposcopy results such as white acetic acid area, abnormal blood vessels and abnormal iodine stained area were classified as CIN 1 (score 0-2), CIN 2 (score 3-4) and CIN 3 (rating 5-8), based on Reid score. All patients were identified and biopsied. Biopsies were performed by punch biopsy forceps from suspicious lesions while four quadrant biopsy was taken in normal Colposcopic cases with sedation and paracervical block with 1% lignocaine injection in those with either pap smear or colposcopy or both or any were abnormal. Colposcopic biopsies were performed and histopathology sections were prepared, stained with hematoxylin and eosin, and examined under light. Biopsy results were classified as chronic cervicitis, cervical intraepithelial neoplasia CIN 1, CIN 2, CIN 3, carcinoma in situ, squamous cell carcinoma and adenocarcinoma.

RESULTS

In our study total 80 patients as per the inclusion and exclusion criteria attending Gynecology OPD of Muzaffarnagar Medical College, Muzaffarnagar, Patients with abnormal cervical cytology reports were subjected to colposcopy and further biopsy.

Table 1: Distribution Of Women According To Age, Socio- economic Status, region, education, married Life, Obstetric History

Variables	Categories	No of Patients	%
Age	20-30 years	6	7.5%
	31-40 years	30	37.5%
	41-50 years	36	45.0%
	51-60 years	8	10.0%
Socio economic Status	Upper	2.0	2.5%
	Upper middle	18.0	22.5%
	Lower middle	38.0	47.5%
	Upper lower	9.0	11.3%
	Lower	13.0	16.3%
Region	Rural	64	80.0%
	Urban	16	20.0%
	Total	80	100.0%
Education	Illiterate	58	72.5%
	Literate	22	27.5%
Married Life	<5	1	1.3%
	6-10	16	20.0%
	11-15	19	23.8%
	15-20	16	20.0%

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	>20	28	35.0%
Obstetric history	Para 1	2	2.5%
	Para 2	18	22.5%
	Para 3	43	53.8%
	Para 4 & above	17	21.3%

In our study, out of 80 women with abnormal pap smear maximum no of woman belongs to 41-50 years,mean age in our study was 41.7 years. Majority of patients belong to lower middle class of socioeconomic status. Majority of women belong to rural area that was 80% and mostly women were illiterate. Maximum no of women with married life >20 years and maximum of them were multiparous i.e. para 3.

Table 2: Distribution Of Women According To Abnormal Pap Smear, Colposcopic And Histopathological Findings

Variables	Categories	No of Patients	%
PAP Smear	ASCUS	32	40.0%
	LSIL	30	37.5%
	HSIL	12	15.0%
	ASC-H	6	7.5%
Colposcopic findings	Normal	30	37.5%
	CIN I	21	26.3%
	CIN II	17	21.3%
	CIN III	12	15.0%
Histopathology findings	Non- specific Cervicitis/Inflammatory	28	35.0%
	CIN-1	19	23.8%
	CIN-2	18	22.5%
	CIN-3	12	15.0%
	Squamous cell Carcinoma	3	3.8%

In our study according to PAP smear report, out of 80 women cases of ASCUS were 40%, LSIL cases were 37.5%, HSIL cases were 15% and ASC-H cases were 7.5%. All these women underwent colposcopic examination. It was found that 37.5% were normal, 26.3% were CIN I, 21.3% were CIN II and 15% were CIN III. Whereas Histopathological examination of these women showed that Non-specific Cervicitis/Inflammatory were 35%, CIN 1 were 23.8%, CIN 2 were 22.5%, CIN 3 were 15% and squamous cell carcinoma cases were 3.8%.

Table 3: Correlation Of Pap Smear and Colposcopic Finding (based On Reid Index)

PAP SMEAR	COLPOSCOPIC FINDING (Based on reid index) Likely to be				Total
	NORMAL	CIN I	CIN II	CIN III	
ASCUS	17 (21.3%)	13 (16.3%)	2 (2.5%)	0 (0%)	32 (40%)
LSIL	13 (16.3%)	7 (8.8%)	10 (12.5%)	0 (0%)	30 (37.5%)
ASC-H	0 (0%)	1 (1.3%)	3 (3.8%)	2 (2.5%)	6 (7.5%)
HSIL	0 (0%)	0 (0%)	2 (2.5%)	10 (12.5%)	12 (15%)
Total	30 (37.5%)	21 (26.3%)	17 (21.3%)	12 (15%)	80 (100%)
p-value (Fisher Exact test) & significance	0. 072×10-14 (<0. 05) Significant				

In our study, 40% ASCUS results on colposcopic findings as 21.3% normal, 16.3% CIN I, 2.5% CIN II. 37.5% LSIL cases detected on colposcopy as 16.3% normal, 8.8% CIN I, 12.5% CIN II. 7.5% ASC-H revealed as 1.3% CIN I, 3.8% CIN II and 2.5% CIN III. 15% HSIL cases results into 2.5% CIN II, 12.5% CIN III.

Table 4: Correlation of Pap Smear And Histopathological Examination

Histopathological Examination	PAP smear				Total
	ASCUS	LSIL	ASC-H	HSIL	
Benign	14 (17.5%)	14 (17.5%)	0 (0%)	0 (0%)	28 (35%)
CIN I	11 (13.8%)	6 (7.5%)	2 (2.5%)	0 (0%)	19 (23.8%)
CIN II	7 (8.8%)	10 (12.5%)	0 (0%)	1 (1.3%)	18 (22.5%)
CIN III	0 (0%)	0 (0%)	3 (3.8%)	9 (11.3%)	12 (15%)
SCC	0 (0%)	0 (0%)	1 (1.3%)	2 (2.5%)	3 (3.8%)
Total	32 (40%)	30 (37.5%)	6 (7.5%)	12 (15%)	80 (100%)

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p-value (Fisher Exact test) & significance	0. 028×10-11 (<0. 05) Significant

Total 80 abnormal pap smear cases underwent into biopsy in which 40% ASCUS results into 17.5% nonspecific chronic cervicitis, 13.8% CIN I, 8.8% CIN II cases. 37.5% patient of LSIL results in to 17.5% nonspecific chronic cervicitis, 7.5% CIN I, 12.5% CIN II. 7.5% ASC-H cases results in 2.5% CIN I, 3.8% CIN III, 1.3% SCC. 15% HSIL results into 1.3% CIN II, 11.3% CIN III, 2.5% SCC.

Table 5: Correlation Between Histopathological Findings With Colposcopic Finding

Histopathological findings	COLPOSCOPIC FINDING				Total
	Normal	CIN I	CIN II	CIN III	
Benign	24 (30%)	4 (5%)	0 (0%)	0 (0%)	28 (35%)
CIN I	6 (7.5%)	11 (13.8%)	2 (2.5%)	0 (0%)	19 (23.8%)
CIN II	0 (0%)	6 (7.5%)	12 (15%)	0 (0%)	18 (22.5%)
CIN III	0 (0%)	0 (0%)	2 (2.5%)	10 (12.5%)	12 (15%)
SCC	0 (0%)	0 (0%)	1 (1.3%)	2 (2.5%)	3 (3.8%)
TOTAL	30 (37.5%)	21 (26.3%)	17 (21.3%)	12 (15%)	80 (100%)
p-value (Fisher Exact test) & significance	0. 022×10-14 (<0. 05) Significant				

Out of total 80 cases, underwent histopathological examination, 35% patients detected as non-specific cervicitis, 23.8% detected as CIN 1, 22.5% detected as CIN 2, 15% as CIN 3, 3.8% patient detected as Squamous cell carcinoma.

Table 6: Validity Of Colposcopy Using Reid Index with Histopathology:

Reid Index	Over Estimation	Under Estimation	Accurate Estimation	Total
Normal	0 (0%)	6 (7.5%)	24 (30%)	30 (37.5%)
CIN I	3 (3.8%)	6 (7.5%)	12 (15%)	21 (26.3%)
CIN II	2 (2.5%)	2 (2.5%)	13 (16.3%)	17 (21.3%)
CIN III	2 (2.5%)	0 (0%)	10 (12.5%)	12 (15%)
Total	7 (8.8%)	14 (17.5%)	59 (73.8%)	80 (100%)

In present study, accurate estimation of Colposcopy occurs in 73.8% cases, in 8.8% patient colposcopically overestimated, and in 17.5% cases underestimated.

DISCUSSION

In our study the majority of patients belong to the age group of 41-50 yrs. Mean age in the present study was 41.7 yrs which was comparable to the study of Chandrakala Joshi et al (2015)(7) and Dinesh Kumar et al(2021)(8). All these studies indicate that carcinoma Cervix is common in elderly age groups. majority of patients belongs to rural areas and lower middle class, Similarly studied by Nagaramadevi et al(2012)(9).

There was higher incidence of CIN, when duration of exposure of sexual intercourse to the woman increases, so duration of marriage and intercourse had a distinct role in the geneis of cervical dysplasia. In our study, incidence of CIN is maximum in women with married life > 20 years, Similaryl , Saha Thapa et al(2005) [10] study shows mean age of marriage was 21 years, Nagarmadevi et al [9] study shows mean age was 19 years. In our study, maximum patients 54% were in parity 3 group. Similarly, Pooja Gupta et al (2020)[11] shows as parity increases chances of malignancy increases, Kirtipal subedi et al(2019)[12] study shows maximum patients were in 3-4 parity.

All patients with abnormal cervical cytology reports were included in our study. In which ASCUS in 40% cases, LSIL in 37.5% cases, HSIL in 15% cases and ASC-H in 7.5% patient which was comparable to study of Kirtipal subedi (2019)et al (12)All women with abnormal cervical cytology was taken for Colposcopic examination and further biopsy was taken. In our study, based on Reid Colposcopic index score all abnormal Colposcopic findings was categorized as CIN I in 26.3% cases, CIN II in 21.3% cases, CIN III in 15% cases. Normal Colposcopic findings seen in 37.5% patients. Kirtipal subedi (2019) et al (12) study shows normal in 45%, CIN 1 in 23%, CIN 2 in 16%, CIN 3 in 15% cases. In our study, histopathology reports for all abnormal cervical cytology shows 35% non specific cervicitis/inflammatory, 23.8% CIN 1, 22.5% CIN 2, 15% CIN 3 and Squamous cell carcinoma in 3.8% cases. In our study, accurate estimation for benign lesion was 30% and underestimation was 7.5%. For CIN 1 accurate estimation was 15%, under estimation 7.5%, over estimation 3.8%. For CIN 2, 16.3% accurate estimation done, 2.5% over estimation and 2.5% under estimation done. For CIN 3, 12.5% accurate estimation, and 2.5% over estimation done. While evaluating the validity of Colposcopy with histopathology, colposcopy seems to make an

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accurate diagnosis in 73.8% cases, overestimating in 8.8% cases, and underestimating in 17.5% cases. Kirtipal subedi et al (2019) (12) study shows validity of Colposcopy with histopathology, colposcopy seems to make an accurate diagnosis in 75% of cases, overestimating in 15% cases, and underestimating in 8% of cases.

CONCLUSION

Earlier diagnosis of Cervical intraepithelial neoplasia (CIN) in adult women is a desirable objective. CIN lesions and early invasive cancers should be diagnosed in an early stage for appropriate management. In India and other developing countries, social, educational, and medical resources lag. Colposcopy is better tool for the evaluation of women with abnormal Pap smears, unhealthy cervix, and seems to be more accurate in detecting CIN. colposcopy eliminates the need for repeated follow up as in pap smear which has defined low sensitivity. Hence, colposcopy with biopsy should be incorporated in women with abnormal cervical cytology. Colposcopy using RCI (Reid Colposcopic Index) has satisfactory diagnostic efficacy and the good correlation with histopathology makes it a valid tool in order to detect timely changes that precedes the cancer cervix.

Limitations of the study

In our study, patients were included only from one hospital that represented a sample from a single geographical area.

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