

Colposcopic evaluation of cervix and its correlation with Papanicolaou smear

Authors:

Dr. Nirmala Sharma¹, Dr. Anushika Kedawat², Dr. Neha Sehra^{3*}

MS, FICOG, Senior professor and Unit head, Department of obstetrics and gynaecology, Government medical college, Kota, Rajasthan¹.

3rd Year Junior Resident, Department of obstetrics and gynaecology, Government medical college, Kota, Rajasthan².

MS, DNB, Associate professor, Department of obstetrics and gynaecology, Government medical college, Kota, Rajasthan³.

Corresponding Author:

Dr. Neha Sehra*

MS, DNB, Associate professor, Department of obstetrics and gynaecology, Government medical college, Kota, Rajasthan³.

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ABSTRACT:

Cervical cancer is a well-known woman's health threat, it ranks second most common gynaecological neoplasm in the developing countries like India. Its long pre-invasive phase provides an opportunistic window to screen and treat the disease. Aim of the study was to compare the sensitivity and specificity of colposcopy over conventional pap's smear. This prospective study was conducted over 200 women in the department of obstetrics and gynaecology, Government medical college, Kota, Rajasthan from march 2021 to September 2022. Methods and Material: Eligible women undergone per speculum examination, pap's smear, colposcopy and colposcopic guided biopsy for histopathological confirmation. Total 37 cases of cervical intra-epithelial neoplasia (CIN) diagnosed. Higher incidence found amongst illiterates; most common presenting complaint was white discharge per vaginum followed by postmenopausal bleeding. On examination cervical erosion was found in maximum 35% of women. A sensitivity of 75.7% and specificity of 95.1% of colposcopy with a positive predictive value of 77.7%, negative predictive value of 94.5% was obtained. To conclude Pap's smear is ideal for mass screening as it is economical but Colposcopy is useful to localise the lesion and evaluate its extent. It helps to differentiate between inflammatory atypia and neoplasm. Our study suggested that colposcopy is definitely more sensitive and accurate than pap smear. we need to cover the target population with a more specific approach with minimum number of visits to reduce the problem of lost to follow up. Colposcopy is definitely a better modality with higher specificity and sensitivity than the conventional pap's smear.

Keywords: *Colposcope, Cervical intra epithelial neoplasia, cervical cancers, pap's smear, prevention.*

INTRODUCTION:

It was Hinselman(Germany) in 1925 who used a front lamp together with a Leitz magnifying glasses to study the vulva, vagina and cervix , and that's how the colposcope was invented. Since then, many modifications were done in the colposcope and now it has proved its role in the screening for carcinoma cervix. Cervical cancer which continues to be a significant health problem, it ranks fourth most common gynaecologic neoplasm in the developed world but in developing countries it is still the second most frequent cause of cancer deaths in women(1)The reported incidence of cervical dysplasia is 15:1000 women who were cytologically screened. Approximately 74,000 women are dying of cancer cervix every year in India, the incidence of invasive cancer is 20-35/1,00,000 women and as per survey

conducted in 1990 by cancer registry ,the incidence of cancer cervix in eastern Rajasthan is reported to be 18.2%. (2) There is a long pre-invasive phase of 10-20 years from cellular atypia through various grades of dysplasia to progress towards the invasive cancer. Early detection and treatment of pre invasive disease in this opportunistic window made cancer cervix a preventable one. The pap smear is a cytological examination of exfoliated cells and is universally used as a screening method. The positive test requires further investigations in the form of colposcopy, cervical biopsy. Whereas colposcopy allows detection as well as treatment of the abnormal lesions, it also helpful in the assessment and evaluation of follow up cases which is not possible with pap;s smear. The rural areas where the high risk population resides, screening by pap's smear demands two visits- one for sampling

second for collection of report, colposcopy on the other hand provides results in a single sitting. Thus there is a need to evaluate the role of colposcope over the pap's smear so that it can be offered in the remote public health centres as a screening modality for cancer cervix so that the target population will be benefitted by the preferred modality.

The purpose of the present study is to compare the sensitivity and specificity of colposcopy over the conventional pap's smear.

MATERIAL AND METHODS:

This prospective clinical study "Colposcopic evaluation of cervix and its correlation with Papanicolaou smear" was conducted in the department of Obstetrics and Gynaecology J. K. Lon Hospital & Govt. Medical College, Kota, Rajasthan over the duration of 18 months between March 2021 to September 2022. Following inclusion and exclusion criteria were applied –

Inclusion criteria:

- Age 18-60 years
- Women with symptoms like - white discharge, post coital bleeding, inter-menstrual bleeding.
- Women with clinically unhealthy cervix on per speculum examination (erosion, cervicitis, cervical polyp, bulky cervix, bleeding on touch, ulcer, simple leukoplakia, keratinisation)

Exclusion criteria:

- Women with age >60 years <18 years
- Women with bleeding per vaginum at the time of examination.
- Women with frank invasive cancer.
- Women underwent hysterectomy.
- Pregnant women

Patients attending routine Gynaecology outdoor were screened for the above criteria and in the above duration total 216 women found to be eligible but 16 patients lost to follow up thus total 200 women were included in the study. After taking informed consent all the enrolled women were subjected to a detailed history, clinical and Gynaecological examination and per speculum examination of cervix, Vulval infections, vaginal inflammation, discharge- its characters (colour, odour, amount, type), cervical inflammation, any growth or bleeding looked for. PAP smear and Colposcopy done for all these women. Result observed on the basis of various parameters like age, socio-economic status of patient, Per speculum examination, Pap's smear findings and colposcopic findings.

METHODOLOGY:

A simple colposcope with magnifications 7.5 and 10X with inbuilt green filter was used. A written informed

consent and counselling done, after emptying the bladder, Physical and local examination done in dorsal lithotomy position, after Speculum examination of cervix and vagina, Pap smear taken by Conventional method using Ayre's spatula and sent for cytopathology after fixing. Normal saline colposcopy examination through green filter followed by Inspection of cervix after application of 3- 5% acetic acid and the application of Lugol's iodine done. Colposcope directed biopsy using a cervical punch biopsy forceps if needed, Application of Monsel's paste for haemostasis if needed, Odell's diagram; photographs were taken in necessary cases for record keeping.

STATISTICAL ANALYSIS:

The data collected was entered in Microsoft Excel spread sheet in coded form. Relevant variables were created and suitable coding was done for each one of them. The data was analysed using licenced version of Statistical Package for Social Sciences (SPSS version 21). All the variables were analyzed using descriptive statistics to calculate frequency of categorical variables; mean, standard deviation and range, were used to describe continuous variables. Univariate analyses were performed first and the results were presented in the form of tables, text, bar-diagrams and pie-charts. Finally, analytical statistics were formulated based on objectives and hypothesis of the study. Bivariate analysis was done using chi square test (or Fischer's exact test wherever applicable). A p value of less than 0.05 was considered significant.

Ethical Clearance:

Institutional ethical committee clearance as obtained before conducting the study.

RESULTS:

Out of 200 women, 18% belonged to 20-29 years, 39% belonged to 30-39 years, 31% women belonged to the age group of 40-49 years and 12% were between 50-60 years. 74% (148/ 200) belonged to rural area and 26% (52/200) were from urban area. Overall, the incidence of CIN was 19.5% (29/148) among the rural population and 15.3% (8/52) among the urban population.

Out of the 200 study participants, 17% were illiterate, 70% had primary / high school education and 13% of women had higher education. Among the illiterates, 73.5% had CIN, but among those studied upto 10th standard, the incidence was only 7.86% and among those with higher education, it was only 3.84%. This showed a higher incidence of CIN among the illiterates than the literates. The association between educational status and CIN was found statistically significant. ($p < 0.01$).

Table no.1-Distribution of study participants according to complaints presented (N=200)-

Complaints	Total cases (200)		CIN cases(37)	
	No.	%	No.	%
White discharge	140	70	25	17.85
Post coital bleeding	10	5	3	30
Intermenstrual bleeding	12	6	3	25
Postmenopausal bleeding	22	11	6	27.27
Loss of weight/appetite	5	2.5	-	-
Others	11	5.5	-	-
Total	200	100	37	18.5

Table no.2. Distribution of study participants according to Colposcopic appearance of cervix (N=200)

Appearance	No. of cases (n=200)	%
Normal	5	2.5
Cervical erosion	70	35
Inflammatory changes	43	21.5
Polyps	10	5
Leukoplakia	3	1.5
Fine punctate pattern of vessels	14	7
Fine mosaic pattern of vessels	17	8.5
Atypical or coarse vessels	5	2.5
Malignant features (intense acetowhite lesions, coarse irregular punctations, cork screw vessels)	2	1
Unsatisfactory	2	1

Grading was done as per swede scoring system and score of 2,3,4 were graded as CIN 1, score of 5,6,7 graded as CIN II and score of 8,9,10, graded as CIN III.

Table no.3 -Correlation between PAP smear report and colposcopy findings-

Paps smear	Colposcopic findings				
	CIN I	CIN II	CIN III	Normal	Total
Normal	15	4	0	141	160
ASCUS	0	0	0	0	0
LSIL	3	3	1	22	29
HSIL	2	6	2	1	11
Squamous cell carcinoma	0	0	0	0	0
Total	20	13	3	164	200

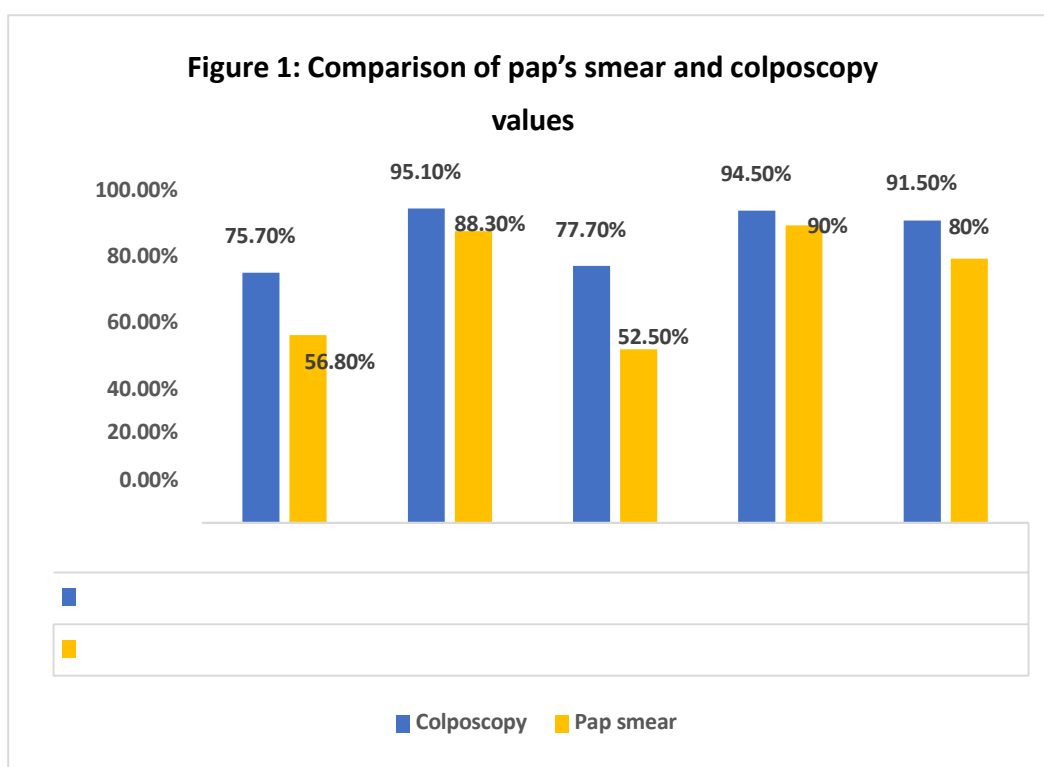
Out of 40 women positive PAP smear, 21 women were positive on histopathology as and 19 were identified as falsely positive. Of the 160 normal on PAP smear, 144 had normal histo-pathological findings. However, 16 were false negative on pap smear. The PAP smear had low sensitivity, high specificity and high accuracy.

Table no.4. Sensitivity & Specificity of Colposcopy in Diagnosing CIN

COLPOSCOPY	HISTOPATHOLOGY		Total
	Positive	Negative	
Positive	28	8	36
Negative	9	155	164
Total	37	163	200

Parameter	Percentage %
Sensitivity	75.7 %
Specificity	95.1%
Positive Predictive Value	77.7%
Negative Predictive Value	94.5%
Accuracy Of Colposcopy	91.5%

out of the 36 women that were likely to have CIN on colposcopy, 28 were found to be positive and 8 were found to be negative on histopathology. Among 164 women who were normal on colposcopy, 155 were truly negative as confirmed by histopathology and 9 were found to be false negative. The findings suggest colposcopy as a diagnostic test to have high sensitivity, specificity, PPV, NPV and accuracy when compared to PAP smear test.



	Sensitivity	Specificity	PPV	NPV	Accuracy
Colposcopy	75.70%	95.10%	77.70%	94.50%	91.50%
Pap smear	56.80%	88.30%	52.50%	90%	80%

Figure 2- VILI- Mustard yellow colour after applying lugol's Iodine



DISCUSSION:

Cervical cancer although a preventable disease, yet tragically remains the second most common cancer in Indian women, pap's smear has long been a screening tool but negative cytology does not always rule out CIN. Colposcopy as a clinical method has been of proven accuracy in evaluating patients with abnormal cervical cytology, but its value as a screening tool has long been disputed. over the duration of 18 months , 200 women were studied, pap's smear, colposcopy and biopsy done in all women to determine sensitivity and specificity of these methods in detecting CIN. Regarding age distribution, high incidence of CIN was found in the age group 30- 49 years with mean age as 44.24 ± 8.06 . In the studies conducted by Kalyankar VY et al (3), Patil P et al (4), and Durdi G et al (5), the maximum patients were in the age group of 31-40 years (39%, 39.2% and 43.7%). Thus, this age group od 30-40 years is at maximum risk of acquiring sexually transmitted HPV infections and CINs. Thus, screening for CINs in this age group is important and we should never miss the opportunity to screen the women in this age group. Socioeconomic status plays an epidemiological role in the genesis of dysplasia. Poor personal hygiene, poor living conditions, unstable marriages, and early age at first intercourse are key factors associated with both low socio-economic conditions and cervical cancer. In our study 74% population belonged to rural area out of which 19.5% was diagnosed with CIN as compared to 15.3% cases of CIN in women from urban area, maybe because of lack of awareness and facilities to get screening tests done on time in rural settings. In our study, the incidence of CIN was found to be higher among the low-income group (20.7%). Regarding the literacy, CIN was more prevalent among the illiterates. In our study, 67.5% (25 out of 37) of CIN was found among the illiterates. Vaidya et al (6) had showed that low socio-economic status had a definite role on the development of dyskaryosis. In his study 80% of CIN I and 50% of CIN II were from the low-income group. Duration of marriage and duration of exposure to sexual intercourse had a distinct role in genesis of cervical dysplasia. In our study, the incidence of CIN was 21% in women who were married for 11-25 years, and 24.59% among women who were married for ≥ 26 years. Kushtagi et al (7) had demonstrated the severity of underlying CIN increased with increase in the

duration of marital life and hence the increase in the duration of sexual intercourse. Our study demonstrated an increased incidence of CIN among multiparous women. Regarding parity, our study showed, increased incidence of CIN among multiparous women. 13.5 % were para 2, 25 % were para 3 and 22.64% were para 4 or more.

In our study, we found that none of the 43 women who practised barrier contraception had CIN. Among the 10.5% of OCP users, almost 19.04% (4/21) showed features of CIN. Out of 8% of IUCD users, the incidence of CIN was 16.21% (6/37). Out of 37.5% of women who had undergone sterilization permanently the incidence of CIN was 17.33% (13/75). 31.11% women who had no history of contraception had features of CIN. Similarly, In the study by Mohanty et al (8), 80% of cases did not practise any form of contraception at all, leading to 93% multiparity rate which, according to author jointly contributed to the risk. 10% of the patients were oral pill users. The relationship between oral contraceptives and development of CIN had been investigated by IARC – International agency for Research in Cancer and they concluded that the use of OCP increased the risk of CIN upto 4-fold after 5 or more years among the HPV DNA positive women (9). Our colposcopy findings suggested, 2.5% patients had normal cervix. 35% patients had erosion of cervix and 21.5% have inflammation of cervix. 15.5% women had fine vascular pattern on cervix. 2.5% women had coarse or atypical vessels when examined under blue-green filter and 1% had frank malignant features i.e., Intense acetowhite lesions, coarse irregular punctations, corkscrew vessels. 1% women had unsatisfactory colposcopy.

On application with 5% acetic acid, 26.5% (53/200) had shady, milky acetowhite area out of which 33.96% (18/ 53) had CIN. Distinct opaque acetowhite area was seen in 19% patients and all of them were diagnosed with CIN. Singh Swati et. al (10) had acetowhitening of 48% in their study which was similar to our study (45.5%) and Ramesh G., et al (11) had 64% patients with acetowhitening which was more than what was observed in our study.

Lugol's iodine application produced iodine positivity in 61% patients out of them 3.3% (4/122) had CIN. Among patients with partial iodine positivity, 18.5% (10/54) had CIN and among women with iodine

negativity, 95.8% (23/24) had CIN. Goel A et al (12) in their study concluded that VILI has sensitivity of 84.2%, specificity of 97.6%, false negative rate of 15.7% and accuracy of 96.8%. Pap smear was taken for all cases. It showed LSIL in 14.5% (29/200) and HSIL 5.5% (11/200) patients. Pap smear correctly estimated CIN in 21 patients and underestimated in 16 patients and overestimated in 19 patients (false positivity). Sensitivity of pap smear was found to be 56.8% which was low as compared to the specificity which was 88.3%. This was attributed to the high number of false negative smears. Correlation between cytology and HPE was poor as far as mild dysplasias were concerned. But the correlation was good for moderate and severe dysplastic lesions.

Correlation between colposcopic findings and biopsy showed a good correlation for higher grade lesions (CIN II and CIN III). Sensitivity was found to be 75.7% and specificity was 95.1%. This showed a high sensitivity and a higher specificity when compared to Pap smear. Sampling variation and difference in inclusion criteria may produce disparity in colposcopic findings of different studies. Colposcopy and biopsy were positive in 28 out of 37 (75.7%) cases while pap smear and biopsy were positive in only 21 out of 37 (56.75%) cases. This indicates the usefulness of colposcopy in diagnosing lesions missed by pap smear. Colposcopy helps to reduce false negative cases seen by cytology and has a wide spectrum of diagnosis as compared to pap's smear.

CONCLUSION:

The earlier diagnosis of CIN and of invasive cervical cancer in adult women is a desirable goal. Pap's smear is ideal for mass screening, economical as it can be done by non-medical staff. It is useful for detecting lesions in endocervical canal and adenocarcinoma. But, Pap smear had low sensitivity and it fails to localise the lesion. Colposcopy is useful as it helps to localise lesion, evaluate its extent. It differentiates between inflammatory atypia and neoplasm and also between invasive and non-invasive lesions of cervix. But it is costly, needs more experience and training as compare to Pap's smear. It is inadequate for detection of endocervical lesions and need endocervical curettage. From the results of this study, it is evident that colposcopy and colposcopy guided biopsy is definitely more sensitive and accurate than pap smear.

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