

## COMPARISON AND CORRELATION OF PAP SMEAR WITH COLPOSCOPY AND HISTOPATHIOLOGY IN EVALUATION OF CERVIX

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**ABSTRACT: AIMS AND OBJECTIVES:** Correlate pap smear findings with colposcopic findings, To localize the lesion by colposcopy and obtain biopsy and to provide appropriate treatment wherever possible. **MATERIAL AND METHODS:** This was a prospective comparative study of 104 patients who attended the Gynecology OPD of KIMS from may2012 to may2014. **INCLUSION CRITERIA:** 1. Women of age between 20-65 years. 2. Women with symptoms like vaginal discharge, post coital bleeding, postmenopausal bleeding, intermenstrual bleeding and persistent leucorrhoea. 3. Women with normal looking cervix but symptomatic. **EXCLUSION CRITERIA:** 1. Women with bleeding at the time of examination. 2. Women with frank lesions. 3. Women with clinical evidence of acute pelvic infection. 4. Women who was previously treated for carcinoma cervix. 5. Pregnant women. **RESULTS:** Sensitivity of pap smear was found to be very low which was 31.25% compared to its specificity which was 94.44%. Which means pap smear shows higher no. of false negative smears Colposcopy showed a high sensitivity 96.57% and a good specificity 88.55% compared to pap smear. **CONCLUSIONS:** It is evident that colposcopy is definitely more sensitive and accurate than pap smear. By combining pap smear with colposcopy, we can maximize the sensitivity and specificity of cancer cervix screening.

**KEYWORDS:** Colposcopy, Pap smear, Cervical intraepithelial lesions, Suspicious looking cervix.

### ABBREVIATIONS:

- ASCUS - Atypical Squamous cells of undetermined significance.
- AW - Acetowhite lesion.
- CIN - Cervical Intraepithelial Lesion.
- CIS - Carcinoma in situ.
- HSIL - High grade squamous intraepithelial lesion.
- HPV - Human papilloma virus.
- IMB - Intermenstrual bleeding.
- INF - Inflammatory.
- LBC - Liquid based cytology.
- LSIL - Low grade squamous intraepithelial lesion.
- M - Menorrhagia.
- N - Normal.
- PCB - Post coital bleeding.
- PMB - Post menstrual bleeding.
- RCI - Reid colposcopic index.
- SQM - Squamous metaplasia.
- VIA - Visual inspection with acetic acid.
- VILI - Visual inspection with lugol's iodine.
- WD - Whitish discharge.

## ORIGINAL ARTICLE

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**INTRODUCTION:** Unhealthy cervix is a very common finding in our country due to poor genital hygiene, malnutrition and multiparity.<sup>1</sup> The naked eye evaluation of unhealthy cervix is deceptive sometimes and it so happens that intra-epithelial lesions are considered as simple cases of erosion due to inflammation.

Cancer uterine cervix is a serious health problem in India.<sup>2</sup> India which accounts for one sixth of the world's population also bears one fifth of the world's burden of cervical cancer. There are approximately 1,30,000 new cases of cervical cancer in India each year and the disease is responsible for almost 20 percent of all female deaths. India's cervical cancer age standardized incidence rate (30.7 per 1,00,000) and age standardized mortality rate (17.4 per 1,00,000) are the highest in South Central Asia.<sup>3</sup>

Invasive cancer of cervix has been considered a preventable cancer because it has a long pre-invasive state, cervical cytology screening programs are available and the treatment of pre-invasive lesions is effective.<sup>4</sup> The unique accessibility of the cervix to direct visualization and the possibility of cellular and tissue sampling has permitted extensive investigations on lesions of cervix. There is excellent evidence that invasive cancer of the cervix develops, from carcinoma in situ or dysplasia.

Therefore screening of the cervix by cytology and colposcopy can significantly reduce the rate of invasive cancers.

### **AIMS AND OBJECTIVES:**

1. Correlate pap smear findings with colposcopic findings.
2. To localize the lesion by colposcopy and obtain biopsy.
3. To provide appropriate treatment wherever possible.

### **DETAIL RESEARCH PLAN:**

**MATERIAL AND METHODS: Source of Data:** This was a prospective comparative study of 104 patients who attended the Gynecology OPD of KIMS from May 2012 to May 2014 (24 months).

Methods of collection of data Informed consent was taken from each patient relevant obstetrics & gynecology history was taken and recorded

Women of age between 20-65 years.

Women with symptoms like vaginal discharge, post coital bleeding, postmenopausal bleeding, intermenstrual bleeding and persistent leucorrhoea.

Women with normal looking cervix but symptomatic.

### **Exclusion Criteria:**

- Women with bleeding at the time of examination.
- Women with frank lesions.
- Women with clinical evidence of acute pelvic infection.
- Women who was previously treated for carcinoma cervix.
- Pregnant women.

**OBSERVATIONS AND RESULTS:** 104 Patients as per the inclusion and exclusion criteria attending KIMS GYNAECOLOGY OPD were considered for the study and patients were subjected to pap smear, colposcopy and biopsy after taking informed consent.

## ORIGINAL ARTICLE

Presenting Complaints	Number of Patients= 104	Percentage	No. of CIN Cases
Whitish discharge	48	46.15%	CIN1=14 CIN2=1
Menorrhagia	20	19.23%	CIN1=3
Inter menstrual bleeding	24	23.07%	CIN1=3 CIN2=2
Post coital bleeding	10	9.61%	CIN1=6 CIN3=1
Post-menopausal bleeding	2	1.92%	CIN2=1 Sq cell ca=1
<b>Total</b>	<b>104</b>	<b>100%</b>	<b>32</b>

Table 1: Presenting complaints

**Presenting Complaints:** Among the complaints, majority of women complaint of excessive white discharge per vagina. Excessive vaginal discharge playing a role in contributing to the development of CIN was proved in many studies in our study, 46.15% patient had pv discharge and high incidence of CIN 46.87% (15/32) was seen in this group. Post coital bleeding was found in 9.61% of cases. Among these women who had post coital bleeding, 70% had benign findings Intermenstrual bleeding was seen in 23.07% of cases Post-menopausal bleeding was present in 1.92% (2/104) of cases only, but out of which one patient was diagnosed with squamous cell carcinoma and other with CIN2

Cervical Examination	Number of cases=104	Percentage	Total No. of CIN Cases
Normal	14	13.46%	CIN1=11
Cervical erosion	88	84.61%	CIN1=15 CIN2=3 CIN3=1
Suspicious looking cervix	2	1.92%	CIN2=1 Sq cell ca=1
<b>Total</b>	<b>104</b>	<b>100%</b>	<b>32</b>

Table 2: Per speculum examination of cervix

Regarding the clinical appearance of cervix, the most common finding was cervical erosion in which the squamous epithelium of ectocervix was replaced by columnar epithelium of endocervix. Erosion was seen in 84.6% of cases out of which, 21.59% had CIN Suspicious looking cervix was seen in 1.92% (2 / 104) of cases.

## ORIGINAL ARTICLE

Age	Number of cases=104	Percentage	No. of CIN cases=31
< 20	16	15.38%	0
21 to 30	25	24.03%	CIN1=7 CIN2=1
31 to 40	43	41.34%	CIN1=8 CIN2=1 CIN3=1 Sq cell ca=1
41 to 50	12	11.53%	CIN1=10 CIN2=1
51 and above	8	7.69%	CIN1=1 CIN2=1
<b>Total</b>	<b>104</b>	<b>100%</b>	<b>32</b>

**Table 3: Age wise distribution**

Regarding age distribution, high incidence of CIN was found among the age group of 31 to 50 years.

Parity	Number of Cases	Percentage	No. of CIN cases
Nulliparous	3	2.33%	CIN1=1
Para1	18	17.30%	CIN1=2
Para2	42	40.38%	CIN1=10 CIN2=2 Sq cell ca=1
Para3	26	25%	CIN1=7 CIN2=1 CIN3=1
para4	8	7.69%	CIN1=4
Para5 or more	7	6.73%	CIN1=2 CIN2=1
<b>Total</b>	<b>104</b>	<b>100%</b>	<b>32</b>

**Table 4: Parity wise Distribution**

Regarding parity, our study showed increased incidence of CIN among multiparous women. 40.62% were para2, 28.12% were para3, 12.5% were para4 and 9.37% were para5 and more.

NO. 5 Socio economic status.

## ORIGINAL ARTICLE

Socio Economic Status	Number=104	Percentage
Lower class= <1000 rupees	28	26.9%
Upper lower class= 1000 to 2000 rupees	22	21.10%
Lower middle class= 2000 to 5000 rupees	48	46.15%
Upper middle class= >5000	6	5.76%
<b>Total</b>	<b>104</b>	<b>100%</b>

Table 5: Socio Economic Status

Socio economic status had always been playing an epidemiological role in genesis of dysplasia. In our study, the incidence of CIN was found to be higher among the lower middle class.

Education	No. of Cases	Percentage	No. of CIN Cases	Percentage
Illiterate	53	50.96%	CIN1=9 CIN2=2 CIN3=1 Sq cell ca=1	40.62%
Up to 10 <sup>th</sup> standerd	44	42.30%	CIN1=12 CIN2=1	40.62%
degree	7	6.73%	CIN1=5 CIN2=1	18.75%
<b>Total</b>	<b>104</b>	<b>100%</b>	<b>32</b>	<b>100%</b>

Table 6: Education

Regarding the literacy, CIN was more prevalent among the illiterates, in our study, 40.62% (13 out of 32) of CIN was found among the illiterates. And, 40.62% (13 out of 32) was found in patients studied up to std. 10<sup>th</sup>. This was attributed to lack of awareness of symptoms and failure to seek medical care.

Duration	No. of Cases	Percentage	No. of CIN Cases
Less than 5 years	13	12.5%	CIN1=6
5 to 10 years	37	35.57%	CIN1=7 CIN2=1
10 to 20 years	34	32.69%	CIN1=10 CIN2=2 CIN3=1
More than 20 years	20	19.23%	CIN1=3 CIN2=1 Sq cell ca=1
<b>Total</b>	<b>104</b>	<b>100%</b>	<b>32</b>

Table 7: Duration of Marriage

## ORIGINAL ARTICLE

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 40.62% among 10 to 20 years duration of marriage. The severity of underlying CIN increased with increase in the duration of marital life and hence the increase in the duration of sexual intercourse.

Findings	Number of Cases=104	Percentage
Sq metaplasia	58	55.76%
Fine punctations	11	10.57%
Aceto white area	23	22.11%
Coarse punctations	10	9.61%
Mosaic pattern	2	1.92%
<b>Total</b>	<b>104</b>	<b>100%</b>

Table 8: Colposcopy findings

Findings	Number of Cases=104	Percentage
Normal	22	21.15%
Inflammatory	68	65.38%
LSIL	9	8.65%
HSIL	4	3.84%
Malignancy	1	0.96%
<b>Total</b>	<b>104</b>	<b>100%</b>

Table 9: Pap smear findings

Findings	Number of Cases=104	Percentage
Cervicitis	72	69.23%
CIN1	24	23.07%
CIN2	6	5.76%
CIN3	1	0.96%
Sq cell ca	1	0.96%
<b>Total</b>	<b>104</b>	<b>100%</b>

Table 10: Biopsy findings

Colposcopic findings	Biopsy Findings					
	Total no.	Cervicitis	CIN1	CIN2	CIN3	Sq cell ca
Sq metaplasia	59	58	1			
Fine punctations	10	4	4	1	1	
Aceto white	23	8	13	2		
Coarse punctations	10	2	6	2		
mosaic	2			1		1
<b>Total</b>	<b>104</b>	<b>72</b>	<b>24</b>	<b>6</b>	<b>1</b>	<b>1</b>

Table 11: Correlation of colposcopy with biopsy

**Correlation of Colposcopy with Biopsy:**

- Sensitivity= $31/32 \times 100 = 96.87\%$ .
- Specificity= $58/72 \times 100 = 88.55\%$ .
- PPV= $32/46 \times 100 = 69.56\%$ .
- NPV=  $58/58 \times 100 = 98.30\%$ .
- Accuracy=  $32+58/100 = 86.53\%$ .

This data suggested that with colposcopy as a screening tool, the rate of false negative cytology could be significantly reduced. Colposcopy enhanced cervical screening particularly in women with otherwise negative smear.

Correlation between pap smear and biopsy was poor as far as CIN1 was concerned. But was good for CIN2 and CIN3.

Correlation between colposcopy findings and biopsy showed a good correlation for higher grade lesions.

Colposcopy showed a high sensitivity and a low specificity compared to pap smear. Low specificity was due to high incidence of acetowhite area which might be due to inflammation, immature metaplasia or latent HPV infection.

PAP SMEAR FINDINGS	BIOPSY FINDINGS					
	Total	Cervicitis	CIN1	CIN2	CIN3	Sq cell ca
Normal	22	22				
Inflammatory	68	46	21	1		
LSIL	9	4	3	2		
HSIL	4			3	1	
malignancy	1					1
<b>Total</b>	<b>104</b>	<b>72</b>	<b>24</b>	<b>6</b>	<b>1</b>	<b>1</b>

**Table 12: Correlation of pap smear with biopsy**

**Correlation of Pap smear with Biopsy:**

- Sensitivity=  $10/32 \times 100 = 31.25\%$ .
- Specificity=  $68/72 \times 100 = 94.44\%$ .
- PPV=  $10/14 \times 100 = 77.42\%$ .
- NPV=  $68/90 \times 100 = 75.55\%$ .
- Accuracy=  $10+68/104 \times 100 = 75\%$ .

Pap smear was taken for all cases. It showed inflammatory smear for 65% of cases, LSIL was seen in 8.65% and HSIL in 3.84%

Sensitivity of pap smear was found to be very low which was 31.25% compared to its specificity which was 94.44%. Which means pap smear shows higher no. of false negative smears.

Pap Smear findings	Colposcopic Findings					
	Total	Sq metaplasia	Aceto white	fine punctations	Coarse punctations	Mosaic Pattern
Normal	22	20	2			
Inflammatory	68	38	5	18	7	
LSIL	9		4	3	2	
HSIL	4			2	1	1
Malignancy	1					1
<b>Total</b>	<b>104</b>	<b>58</b>	<b>11</b>	<b>23</b>	<b>10</b>	<b>2</b>

Table 13: Correlation of pap smear with colposcopy

**Correlation of Pap smear with Colposcopy:**

- Sensitivity=  $14/46 \times 100 = 30.43\%$ .
- Specificity=  $58/58 \times 100 = 100\%$ .
- PPV=  $14/14 \times 100 = 100\%$ .
- NPV=  $58/90 \times 100 = 64.44\%$ .
- Accuracy=  $14+58/104 \times 100 = 71.28\%$ .

Correlation	Sensitivity	Specificity	PPV	NPV	Accuracy
Colposcopy with biopsy	96.87%	88.55%	69.56%	98.30%	86.53%
Pap smear with biopsy	31.25%	94.44%	77.42%	75.55%	75%
Pap smear with colposcopy	30.43%	100%	100%	64.44%	71.28%

Table 14: Correlation of pap smear, colposcopy and biopsy findings

Efficacy of colposcopy and pap smear.

**DISCUSSION:** Cervical cancer is the second most frequent cancer worldwide, in women after breast cancer. However, invasive cancer of the cervix was considered to be preventable condition as it is associated with a long pre invasive stage (CIN) making it amenable to screening and treatment.

In the present study, screening was done in 104 women with symptoms like vaginal discharge, post coital bleeding, postmenopausal bleeding, intermenstrual bleeding and persistent leucorrhoea. Women with unhealthy cervix, with persistent inflammatory smear were included.

Regarding age distribution high incidence of CIN was found among the age group of 31 to 50 years.

Anujabhalerao et al, in their study showed the prevalence of CIN was higher in women over 30 years.<sup>5</sup>

Pradhan B, mital V P et al showed in their study than CIN was more prevalent in age group of 41 to 50 years.<sup>6</sup>

## ORIGINAL ARTICLE

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Ashmita D et al showed maximum patient of CIN between the age group 30 to 50 similar results were seen in following studies.<sup>7</sup>

Regarding parity, our study showed increased incidence of CIN among multiparous women. 40.62% was para 2, 28.12% were para 3, 12.5% were para4 and 9.37% were para5 and more.

Similar study by anujabhalerao et al showed the mean parity 2.6 in patient with higher no. on CIN.<sup>5</sup>

N gopal, prashant s joshi, showed increased incidence of CIN in para 2.<sup>8</sup>

S sharma, M saini et al showed maximum CIN in para 2.<sup>9</sup>

Regarding the literacy, CIN was more prevalent among the illiterates, in our study, 40.62% (13 out of 32) of CIN was found among the illiterates. And, 40.62% (13 out of 32) was found in patients studied up to std. 10<sup>th</sup>. This was attributed to lack of awareness of symptoms and failure to seek medical care.

Socio economic status had always been playing an epidemiological role in genesis of dysplasia. In our study, the incidence of CIN was found to be higher among the lower middle class.

D hegde, H shetty n et al had showed that lower middle class had a higher incidence of CIN.<sup>10</sup>

Vaidya had showed that low socio economic status had a definite role in development of dyskaryosis.<sup>11</sup>

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 40.62% among 10 to 20 years duration of marriage. The severity of underlying CIN increased with increase in the duration of marital life and hence the increase in the duration of sexual intercourse.

Kushtagi et al 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.<sup>12</sup>

Among the complaints, majority of women complaint of excessive white discharge per vagina.

Excessive vaginal discharge playing a role in contributing to the development of CIN was proved in many studies.

In our study, 46.15% patient had pv discharge and high incidence of CIN 46.87% (15/32) was seen in this group.

Anujabhalerao et al, showed that the most common symptom was vaginal discharge which was 71%.<sup>5</sup>

Asmita D, showed complaints of pv discharge in 30% of cases.<sup>7</sup>

Post coital bleeding was found in 9.61% of cases. Among these women who had post coital bleeding, 70% had benign findings cell carcinoma and other with CIN2.

Ramesh G, sudha R et al, showed 3.75% of cases having post-menopausal bleeding. Ramesh G, sudha R et al, among the complaints, 6.25% cases had post coital bleeding. Intermenstrual bleeding was seen in 23.07% of cases.

Ramesh G, sudha R et al, showed 16.25% of cases with intermenstrual bleeding.<sup>13</sup>

Post-menopausal bleeding was present in 1.92% (2/104) of cases only, but out of which one patient was diagnosed with squamous.

Regarding the clinical appearance of cervix, the most common finding was cervical erosion where the squamous epithelium of ectocervix was replaced by columnar epithelium of endocervix. Erosion was seen in 84.6% of cases out of which, 21.59% had CIN.

Suspicious looking cervix was seen in 1.92% (2 / 104) of cases.

## ORIGINAL ARTICLE

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When 5% acetic acid was applied to suspicious area, one showed coarse punctations while the other showed mosaic pattern. On pap smear, one was diagnosed as CIN2 and the other as sq cell ca.

This data suggested that with colposcopy as a screening tool, the rate of false negative cytology could be significantly reduced. Colposcopy enhanced cervical screening particularly in women with otherwise negative smear.

Correlation between pap smear and biopsy was poor as far as CIN was concerned. But was good for CIN2 AND CIN3.

Correlation between colposcopic findings and biopsy showed a good correlation for higher grade lesions.

Colposcopy showed a high sensitivity and a good specificity compared to pap smear.

**SUMMARY:** This study was a comparative study conducted in the department of obstetrics and gynaecology during the period from may2012 to may2014 in 104 women who fulfilled the inclusion criteria.

Pap smear, colposcopy and biopsy were done for all the cases after proper counseling.

The results were tabulated and analyzed majority of CIN 68.75% occurred in the age group of 31 to 50 years.

Regarding parity, our study showed increased incidence of CIN among multiparous women. 40.62% were para2, 28.12% were para3, 12.5% were para4 and 9.37% were para5 and more in our study, the incidence of CIN was found to be higher among the lower upper class 34.37% (11/32) the incidence of CIN was 40.62% among 10 to 20 years and 15.67% in duration of marriage more then 20years 46.15% patient had pv discharge and high incidence of CIN 46.87% (15/32) was seen in this group.

Post coital bleeding was found in 9.61% of cases. Among these women who had post coital bleeding, 70% had benign findings.

Post-menopausal bleeding was present in 1.92% (2/104) of cases only, but out of which one patient was diagnosed with squamous cell carcinoma and other with CIN2.

Erosion was seen in 84.6% of cases out of which, 21.59% had CIN.

Suspicious looking cervix was seen in 1.92% (2/104) of cases.

Pap smear was taken for all cases. It showed inflammatory smear for 65% of cases, LSIL was seen in 8.65% and HSIL in 3.84%.

Sensitivity of pap smear was found to be very low which was 31.25% compared to its specificity which was 94.44%. Which means pap smear shows higher no. of false negative smears Colposcopy showed a high sensitivity 96.57% and a good specificity 88.55% compared to pap smear.

**CONCLUSION:** Early diagnosis of CIN in adult women is a desirable goal. CIN lesions and early invasive cancers should be diagnosed in an earlier stage for instituting.

Appropriate management. Invasive cancer of cervix is considered to be preventable since it is associated with a long pre-invasive stage (CIN) making it amenable to screening and treatment.

From the results of this study, it is evident that colposcopy is definitely more sensitive and accurate than pap smear. By combining pap smear with colposcopy, we can maximize the sensitivity and specificity of cancer cervix screening.

## ORIGINAL ARTICLE

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Colposcope in general has a role in the evaluation of women with abnormal pap smears, unhealthy cervix, and seems to be more accurate in detecting CIN. Hence, primary colposcopy may be incorporated into screening at first visit.

Thus colposcopy offers an excellent tool in evaluating cervical lesions. It is an easy and perspective method and its importance lies in teaching, diagnosis and management of cervical lesions, both neoplastic and non-neoplastic. There is a need to introduce and encourage the practice of colposcopy, in all medical institutions to evaluate and to manage patients with clinically suspicious cervix and abnormal pap smears.

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## ORIGINAL ARTICLE

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**COMPETING INTERESTS:** None

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