



## STUDY OF CYTOMORPHOLOGICAL SPECTRUM OF CERVICAL LESIONS ON PAP SMEAR IN A TERTIARY CARE HOSPITAL.

### Pathology

**Dr. Bhayekar  
Pallavi D**

MD (Pathology), Shrimati Kashibai Navale medical college and general hospital, Pune.

**Dr. Joshi Sourabh\***

MD (Pathology), Shrimati Kashibai Navale medical college and general hospital, Pune\*Corresponding Author

**Dr. Sinai  
Khandeparkar  
Siddhi G**

MD, (Pathology), Shrimati Kashibai Navale medical college and general hospital, Pune.

**Dr Kulkarni  
Maithili M**

MD, (Pathology), Shrimati Kashibai Navale medical college and general hospital, Pune.

**Dr Nesargi Aditya**

MD, (Pathology), Shrimati Kashibai Navale medical college and general hospital, Pune.

### ABSTRACT

**Background:** Worldwide cervical cancer is the fourth most common cancer in females. It is one of the leading cause of cancer mortality and morbidity in developing countries like India. Pap smear examination is an effective, easy and less invasive screening procedure.

**Methods:** This retrospective study includes total 2934 smears collected from patients presented to gynaecology OPD.

**Results:** Out of 2934 smears 5.1% were unsatisfactory for evaluation, 89.22% samples were reported as NILM while ECA was seen in 5.5% cases. In our study ASC/SIL ratio was 2.48.

**Conclusion:** Pap smear cytology is useful diagnostic tool for detection of premalignant lesions of cervical cancer. Histopathological correlation should be carried out in cases of ECA.

### KEYWORDS

Pap Smear, Epithelial Cell Abnormality, Cervical Cytology

#### INTRODUCTION:

Worldwide cervical cancer is the fourth most common cancer in females.<sup>(1)</sup> It is one of the leading cause of cancer mortality and morbidity in developing countries like India.<sup>(2)</sup> India has highest age standardisation incidence of cervical cancer among south asian countries.<sup>(3)</sup>

Dr. George Papanicolaou introduced Papanicolou screen ("PAP smear") for the identification of cervical Lesions in 1941.<sup>(4)</sup> Pap smear examination is a cost effective, easy and less invasive screening procedure. It is used for early diagnosis of cervical lesions so that appropriate treatment of its premalignant lesions can be done.<sup>(5)</sup>

The present study was conducted to know the cytomorphological pattern of various cervical lesions, to find out the distribution of epithelial cell abnormality(ECA) and determination of its diagnostic accuracy by histopathological correlation wherever possible.

#### MATERIAL AND METHODS:

This was a retrospective study carried out in the department of pathology at Smt Kashibai Navale Medical College and General Hospital, Pune, over a period of 2 years i.e. from January 2016 to December 2017. Cervical samples were collected by gynaecology residents using Ayre's spatula and cytobrush. Material was spread over the glass slides and immediately dipped in coplin jar containing 95% ethyl alcohol as fixative. All slides were stained by using Papanicolaou's stain and reported by two pathologists using Bethesda system for reporting cervical cytology (2015). All relevant data was recorded and results were expressed in percentages and proportions. Statistical analysis was done to calculate sensitivity, specificity, positive predictive value(PPV), negative predictive value(NPV) and diagnostic accuracy.

#### RESULTS:

Total 2934 cervical smears were examined over a period of 2 years. Patients age ranged from 20 to 79 years.

Out of 2934 samples 152(5.1%) were unsatisfactory for evaluation either due to scant squamous cell cellularity or obscurement by inflammatory cells and blood. 2618(89.22%) samples were reported as

negative for intraepithelial lesion or malignancy (NILM) while ECA was seen in 164 (5.5%) cases. NILM lesions were further categorised as shown in table no 1.

Total 164 cases of ECA were composed of atypical squamous cells of undetermined significance(ASCUS, n=91,3.1%), atypical squamous cells, cannot exclude a high-grade lesion (ASCH, n=22,0.74%), atypical glandular cells of undermined significance (AGUS, n=4,0.13%), low-grade squamous intraepithelial lesion (LSIL, n=21,0.71%), high-grade squamous cell intraepithelial lesion (HSIL, n=12,0.4%), squamous cell carcinoma (SCC, n=12,0.4%), and adenocarcinomas (n=2,0.06%).

We could retrieve 54 biopsy or hysterectomy specimens for histopathological correlation.

Sensitivity, specificity, PPV, NPV and diagnostic accuracy of our study was 100%, 92.68%, 80%, 100% and 94.34% respectively.

#### DISCUSSION:

Worldwide, cervical carcinoma is the commonest malignancy in females after breast, large intestine and lungs but in developing countries like India, it is the major cause of mortality and morbidity. Various screening tests are available for early detection of its premalignant lesions out of which Pap smear is easy, cost effective and reliable.<sup>(5)</sup>

We examined 2934 pap smears. Most of the patients were in the age group of 40-49 years i.e. 5<sup>th</sup> decade. Other studies also reported maximum number of cases in 4<sup>th</sup> and 5<sup>th</sup> decade.<sup>(1)</sup>

In the present study most common reported category was NILM (89.22%) while ECA was seen in 5.5%. This is in accordance with study by Babu et al who found ECA in 4.03%.<sup>(1)</sup> Similar findings were observed by other studies also.<sup>(6,7)</sup> In contrast Tailor et al found incidence of ECA cases as low as 1.9 while Banik et al found it as high as 8.18%.<sup>(8,9)</sup> Variations in these results may be due to geographic locations of studies and number of cases studied.

In the present study among the NILM cases 17.7%, were normal without any associated pathological findings. Similar findings were

noted by various other studies.<sup>(7)</sup> Non specific inflammation (NSI) was seen in 46.45% cases. Other NILM cases were composed of infections like bacterial vaginosis (BV) (9.4%), candidiasis (7.9%) and trichomonas vaginalis (TV) (0.78%). Smears with atrophic changes were noted in 7.9% cases. One of the study of 7127 cases found 74.99% cases of NSI and BV as most common infection (9.88%) similar to our findings while others reported NSI in 66.5% cases and BV in 1.16% cases.<sup>(3,10)</sup> But study by Babu et al have found TV as most common infection(15.51%).<sup>(1)</sup>

In our study, rate of ASCUS reporting was 3.1%. It is suggested that in low risk population, rate of ASCUS should be less than 5% but better indicator of Quality Control is ASC/SIL ratio within the range of 2-3. In our study, this ratio was 2.48 which may be due to study conducted in high risk population.<sup>(5)</sup> We compared rate of ASCUS and ASC/SIL ratio with various other studies. (Table no :2)

In present study, LSIL was seen in 21(0.71%) cases and HSIL in 12(0.4%) cases. We reported SCC in 12 cases (0.4%) and 2(0.06%) cases of adenocarcinomas. Our findings are in concordance with other study who found LSIL in 0.57%, HSIL in 0.54% ,SCC in 0.48% and adenocarcinoma in 0.03%.<sup>(3)</sup>

Considering the cytohistopathological correlation, in our study, out of 91 ASCUS cases, biopsy was performed in 20 cases. Most of them were reported as chronic cervicitis. This could be because of reactive / regenerative process. In one case biopsy showed changes of mild dysplasia. Rate of ASCUS is usually higher in most studies as every atypical squamous cell is picked by observers in highly sensitive Pap smear test.<sup>(11,12)</sup> In case of ASC-H cases correlation was possible in 11 cases out of which 5 were CIN/IL, 3 each were of koilocytic atypia and chronic cervicitis.

Among LSIL cases, histology correlation was done in 5 cases. CIN I was reported in 2 cases and reactive atypia in others. Out of 12 HSIL cases CIN III was reported in 2 cases. Two cases of HSIL diagnosed on Pap turned out to be squamotransitional carcinoma on histopathological examination. This cytohistological discrepancy might be due to sample collection from superficial areas only. We reported 14 malignancies on Pap out of which 12 were confirmed by biopsy. One case was false negative as it was CIN III on biopsy and in 1 case biopsy was not done.(Table no :3)(Figure 1)

So Sensitivity, specificity, PPV, NPV and diagnostic accuracy of our study was 100%, 92.68%, 80%, 100% and 94.34% respectively. Our findings were comparable with various other studies. (Table no :4)

**CONCLUSION:**

PAP smear is a simple, less invasive screening method for cervical carcinomas. Proper implementation of Pap screening program should begin at early age for early detection of cervical premalignant lesions. All ECA cases should be correlated histologically for proper patient management.

**TABLE NO:1** –Categorisation of cervical lesions on Pap smear with percentage

Cytological findings	Number of cases	Percentage
<b>Unsatisfactory for evaluation</b>	<b>152</b>	<b>5.1%</b>
<b>NILM (n=2618)</b>	521	<b>89.22%</b>
<b>A. No pathology</b>	2097	17.7%
<b>B. Inflammatory</b>	276	71.47%
• Bacterial vaginosis	233	9.4%
• Atrophic smear	202	7.9%
• Candidiasis	23	6.88%
• Trichomonas vaginalis	1364	0.78%
• Non specific inflammation		46.45%
<b>Epithelial cell abnormality</b>	<b>164</b>	<b>5.5%</b>
• ASCUS	91	3.1%
• ASCH	22	0.74%
• AGC	4	0.13%
• LSIL	21	0.71%
• HSIL	12	0.40%
• SCC	12	0.40%
• Adenocarcinoma	2	0.06%
<b>Total</b>	<b>2934</b>	<b>100%</b>

(ASCUS-Atypical squamous cells of undetermined significance, ACSH-Atypical squamous cells, cannot exclude a high-grade lesion,

AGC-Atypical glandular cells, LSIL- Low-grade squamous intraepithelial lesion , HSIL-High-grade squamous cell intraepithelial lesion, SCC- Squamous cell carcinoma).

**TABLE NO :2** Comparison of various parameters of Pap smear

Diagnosis	Present study	Sankaranarayana et al <sup>(11)</sup>	Narasimha et al <sup>(12)</sup>
ASCUS	3.1%	8.8%	4.14%
LSIL	0.7%	6.2%	2.7%
HSIL	0.4%	1.6%	2.5%
ASC/SIL Ratio	2.48	2.75	0.9

**TABLE NO :3** Pap smear showing correlation with histopathology.

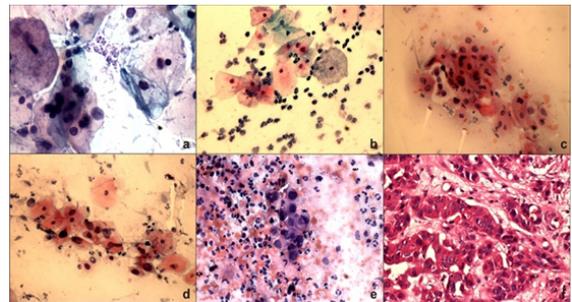
Pap report	Histopathology diagnosis (n=54)
ASCUS (n=20)	Chronic cervicitis (19) CIN I (1)
ASCH (n=11)	CINI/II (5) Chronic cervicitis (3) Koilocytic atypia (3)
AGUS (n=1)	Chronic cervicitis (1)
LSIL (n=5)	CIN I (3) Reactive tytipa (2)
HSIL (n=4)	CIN III(2) Squamotransitional carcinoma(2)
Malignancy(SCC/ Adenocarcinoma) (n=13)	Malignancy(SCC/ Adenocarcinoma) (13)

**TABLE NO:4** Comparison of various parameters of statistical analysis.

	Sensitivity (%)	specificity (%)	PPV (%)	NPV (%)	Diagnostic accuracy (%)
Naik et al <sup>(13)</sup>	79.4	58.3	86.1	46.6	74.5
Malpani G et al <sup>(3)</sup>	86.61	73.33	96.49	32.29	85.21
Chaudhary R et al <sup>(14)</sup>	25.4	99.27	94.12	74.32	76
<b>Present study</b>	100	92.68	80	100	94.34

(PPV-Positive predictive value,NPV-Negative predictive value)

**FIGURE 1:**



**Legends:**

**FIGURE 1:** Photomicrograph showing a) Yeast forms of candida (PAP, 1000x), b) Clue cells (PAP, 400x); c) features of LSIL (PAP, 400x); d) features of HSIL (PAP, 400x), e) features of SCC (PAP, 400x); f) Keratinising SCC on cervix biopsy (PAP, 400x).

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