

A Retrospective Study of Correlation of PAP Smear with Cervical Biopsy in Malignant and Non-malignant Lesions of Cervix in Our Tertiary Hospital at Hapur Region

Amit Kumar Nirmal¹, Gaurav Gautam²

^{1,2}Assistant Professor, Department of Pathology, Saraswathi Institute of Medical Sciences Hapur (U.P)

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Abstract

Background: Papanicolaou (PAP) smear is a simple, non invasive and cost effective method for detection of precancerous changes in the cervix. It is highly effective screening test for the detection of cervical neoplastic changes so that treatment can be started promptly and thus development of invasive cancer can be prevented.

Aim: To study the correlation between PAP smear and cervical biopsy in malignant and non malignant lesions of cervix.

Materials and Methods: Retrospective cross-sectional study was conducted in our teaching hospital at Hapur Region. It included all cases between 1st November 2020 and 31st October 2021 in which both PAP smear and cervical biopsy were done. Cyto-histopathological correlation was done.

Results: Out of the 188 cases, on PAP smears 85% of cases were reported as inflammatory smears. Premalignant lesions like LSIL and HSIL were reported in 5.81% and 4.2% of cases respectively. 1.0% of cases were directly diagnosed as SCC. 3.1% of cases were reported as ASCUS. Cytohistopathological correlation was done. Sensitivity in the present study was 81.3%, Specificity was 92%. Positive predictive value and negative predictive value were 77.6% and 86.5% respectively. Diagnostic accuracy of Pap smear in the present study was 84.5%.

Keywords: Pap smear, cervical biopsy, cervical cancer, HSIL.

Introduction

Carcinoma of uterine cervix is the third most common cancer among women worldwide¹ and it contributes significantly to cancer related morbidity and mortality². Papanicolaou (PAP) smear is a simple,

non invasive and cost effective method for detection of precancerous changes in the cervix³. It widely used as a screening tool in cervical cancer screening program. Diagnosing precancerous lesions and starting appropriate treatment can prevent development of

Corresponding Author: Amit Kumar Nirmal, Assistant Professor, Department of Pathology, Saraswathi Institute of Medical Sciences Hapur (U.P)

E-mail: doctoramitkumarnirmal@gmail.com

Mobile: 9582088553

invasive cancer⁴. Cyto-histopathological correlation of PAP smear is one of the recommendations of the European guidelines for quality assurance for the development of Cytology Laboratory performance and in particular, to reduce false negative results⁵. The present study has been carried out to evaluate the cyto-histopathological correlation of the cervical lesions. Present study was aimed to evaluate the cyto-histo correlation of precancerous and cancerous lesions of uterine cervix and also calculate the sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of PAP smear in diagnosing malignant and non malignant lesions of uterine cervix.

Material and Methods

This study retrospective cross-sectional study was conducted in our teaching hospital at Hapur Region, Uttar Pradesh, over a period of one and half year (18 months), from 1st November 2020 and 31st October 2021. 188 cases with PAP smears whose corresponding cervical biopsy was also available were included in the study. The PAP smears were taken with the Ayer's spatula on a clean glass slide and fixed immediately using fixative containing 95% ethanol and ether in equal parts. Staining of the slides was performed as per conventional papanicolau staining technique. PAP smears were reported in accordance with the Bethesda system 2001. Cervical biopsy tissue material was fixed in 10% neutral buffered formalin solution and processed routinely and stained with haematoxylin and eosin stains. Both the cytology and histology slides were examined by qualified pathologists. Cyto-histopathological correlation was done.

Results

Total number of cases with both PAP smear and cervical biopsy evaluation was 188. Of this 85% cases

were inflammatory smears reported as NILM (Negative for Intraepithelial Neoplasm) (Table-1). Premalignant lesions like LSIL (Figure-1) and HSIL (Figure-2) were seen in 5.8% and 4.2% of cases respectively. 1.0% cases were diagnosed as malignant on pap smear. 3.1% of cases were diagnosed as ASCUS (Atypical Squamous Cells of Undetermined Significance). Cyto-histopathological correlation (Table-3) showed that of the 6 cases reported as ASCUS, 1 was reported as chronic cervicitis and 5 were reported as CIN-I on cervical biopsy. Of the 8 cases reported as HSIL, 7 were reported as CIN-3 (Figure-3) and 3 cases were malignant SCC (Figure-4) (Table-2).

Sensitivity in the present study was 81.3%, Specificity was 92%. Positive predictive value and negative predictive value were 77.6% and 86.5% respectively. Diagnostic accuracy of Pap smear in the present study was 84.5%.

Table 1: Distribution of cases in Pap smear

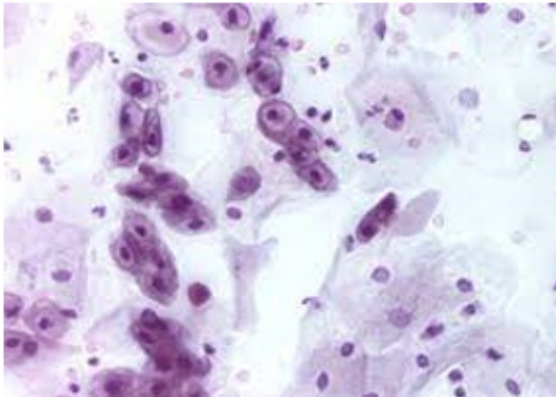
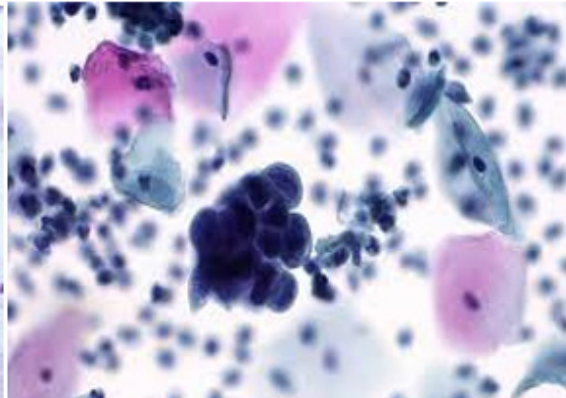
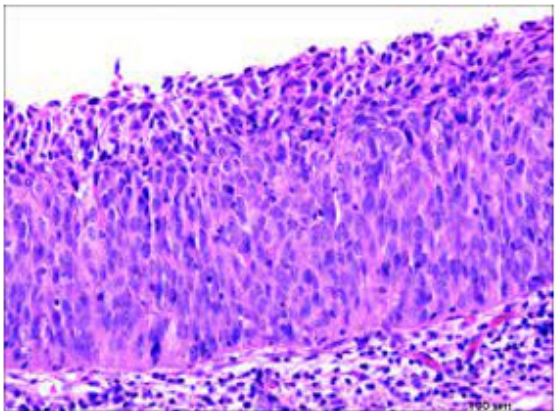
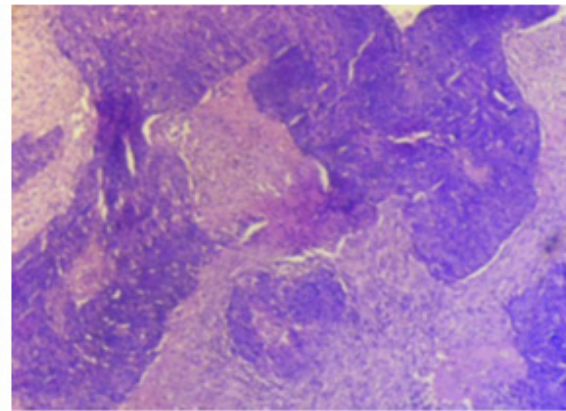
Cytology diagnosis	Distribution of cases (n=188)	
	No. of cases	Percentage (%)
NILM	161	85
ASCUS	6	3.2
LSIL	11	5.8
HSIL	8	4.2
SCC	2	1.06

Table 2: Distribution of cases in cervical biopsy

Biopsy diagnosis	Distribution of cases (n=188)	
	No. of cases	Percentage (%)
Chronic Cervicitis	162	86
CIN-1	11	5.8
CIN-2	5	2.6
CIN-3	7	3.7
SCC	3	1.5

Table 3: Cyto-histopathological correlation

Histopathological diagnosis	No. of cases	Cytological diagnosis				
		NILM	ASCUS	LSIL	HSIL	SCC
Chronic Cervicitis	162	161	1	-	-	-
CIN-1	11	-	5	6	-	-
CIN-2	5	-	-	5	-	-
CIN-3	7	-	-	-	7	-
SCC	3	-	-	-	1	2
Total	188	161	6	11	8	2

**Fig-1: LSIL****Fig-2: HSIL****Fig-3: CIN 3****Fig-4: Squamous cell carcinoma cervix**

Discussion

Pap smear is accepted worldwide as the best screening tool in cervical cancer screening programmes⁶. Although the sensitivity and specificity of the present study were 81.3% and 92% respectively, 1 case of SCC were under-diagnosed as HSIL on pap smear. Also 5 cases of CIN-2 were under-diagnosed as LSIL on Pap smear. These variations may be due to difference in cytological expertise, variation in sampling techniques and preparation of the smear. The other factors which contribute to under calling include air drying, inflammatory reaction and obscuring blood⁷. Diagnostic accuracy of the present study can also be compared to study done by Naik *et. al.*,⁸ in which the overall accuracy of Pap smear reporting was 84.6%. The diagnostic accuracy of the present study was 84.5% which was in comparison to study done by Jain V *et. al.*,⁹ in 2010 in which diagnostic accuracy was 73.2%. In our experience, the clinical impact of discordance is limited, because a repeat Pap smear was routinely recommended in

those cases with epithelial abnormalities before any further therapy such as cone biopsy or hysterectomy was done. The main factor for underreporting SCC as HSIL and CIN-2 as LSIL was less cellularity and hemorrhagic background. In a similar study done by Dhakal *et. al.*,¹⁰ in 2016 concluded that in cytology, false negative results and under reporting of precancerous and cancerous lesions were due to technical errors like air drying and fixation artifact, inflammation and obscuring of the cellular details by blood. Repeat smears from patients with HSIL showed frank malignancy in 1 case and they were later on upgraded as squamous cell carcinoma. According to Abli *et. al.*,¹¹ differentiations of regenerative changes from neoplastic lesions in PAP smear requires taking a biopsy only after 1 positive result in case where ASCUS is found. The sensitivity and specificity of our study was 81.3% and 92% respectively. This was in comparison to study done by Purwa Rangrao Patil *et. al.*, in which the sensitivity was 77.7% and specificity was 84.2%¹². However due to the low socioeconomic status of the patient population,

follow-up is not possible hence usually we proceed with cervical biopsy with colposcopy even after a single positive result. It should be kept in mind that it may lead to an increased false positivity rate.

Conclusion

The study revealed a good correlation between cervical cytology and cervical biopsy. Pap smear is an important screening tool for detection of precancerous and cancerous lesions of cervix. In conclusion we believe interpretation of abnormal cells. However, it is necessary to perform cervical biopsy which is a gold standard, if any epithelial abnormalities are detected in cervical cytology for correlation and confirmation prevented due to early detection of cervical premalignant lesions that the success of screening for cervical cancer is based on collection of adequate materials and correct.

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Ethical Permission: Taken from Institute ethical committee.

Conflict of Interest: None

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