

Correlation of PAP Smear with Cervical Biopsy In Malignant and Non Malignant Lesions of Cervix

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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 effectively used as a screening tool in cervical cancer screening program to identify precancerous lesions 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:** Prospective cross sectional study was conducted in a tertiary care hospital in Chennai. It included all cases between September 2012 and September 2017 in which both PAP smear and cervical biopsy were done. Cyto-histopathological correlation was done. **Results:** Out of the 377 cases, on PAP smears 85% of cases were reported as inflammatory smears. Premalignant lesions like LSIL and HSIL were reported in 6.1 % and 4.5% of cases respectively. 0.7% of cases were directly diagnosed as SCC. 3.1% of cases were reported as ASCUS. Cyto-histopathological 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 cancer, HSIL, Cervical biopsy, SCC.

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INTRODUCTION

Papanicolaou (PAP) smear is a simple, non invasive and cost effective method for detection of precancerous changes in the cervix [1]. It's been widely used as a screening tool in cervical cancer screening program. Diagnosing precancerous lesions and starting appropriate treatment can prevent development of invasive cancer [2]. 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 results [3]. With the above view, the present study has been carried out to evaluate the cyto-histopathological correlation of the cervical lesions.

Aim

The aim of this study is to find the sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of PAP smear in diagnosing malignant and non malignant lesions of cervix

MATERIALS AND METHODS

This prospective cross-sectional hospital based study was conducted in a tertiary care hospital located in Chennai, over a period of 5 years, from September 2012 to September 2017. The study was approved by hospital based ethical committee. 377 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 377. 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 6.1% and 4.5% of cases respectively. 0.7% cases were diagnosed as malignant on pap smear. 3.1% of cases were diagnosed as ASCUS

(Atypical Squamous Cells of Undetermined Significance) (Figure-3). Cyto-histopathological correlation (Table-3) showed that of the 12 cases reported as ASCUS, 3 were reported as chronic cervicitis and 9 were reported as CIN-I on cervical biopsy. Of the 17 cases reported as HSIL, 13 were reported as CIN-3 (Figure-4) and 3 cases were malignant SCC (Figure-5) (Table-2).

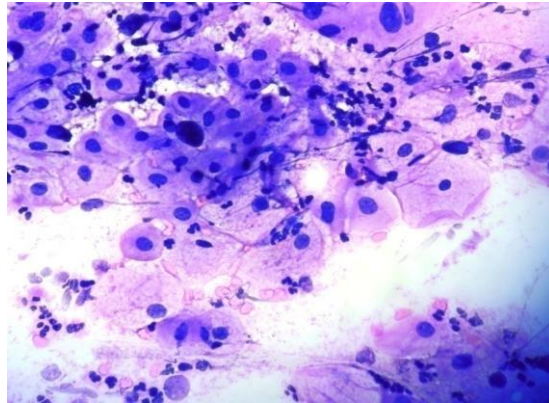


Fig-1: LSIL

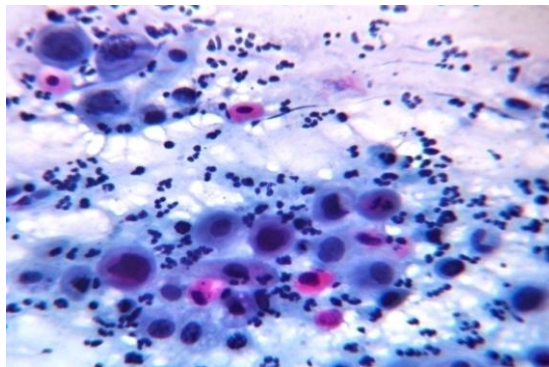


Fig-2: HSIL

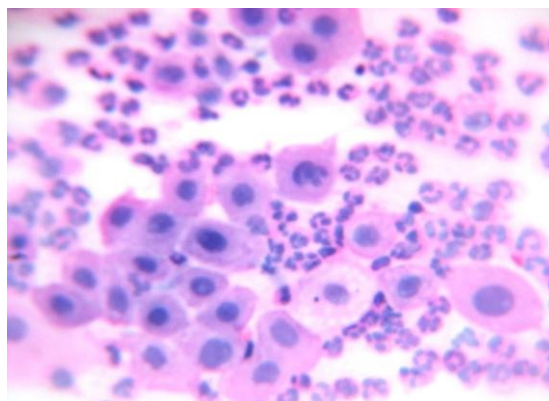


Fig-3: ASCUS

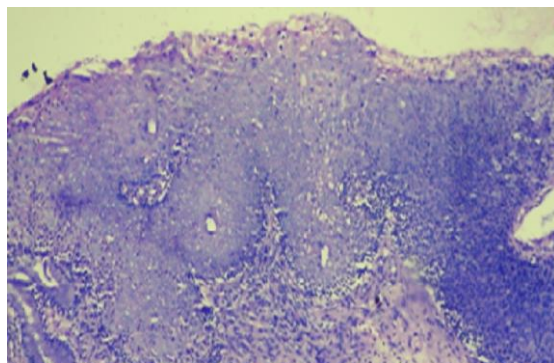


Fig-4: CIN 3

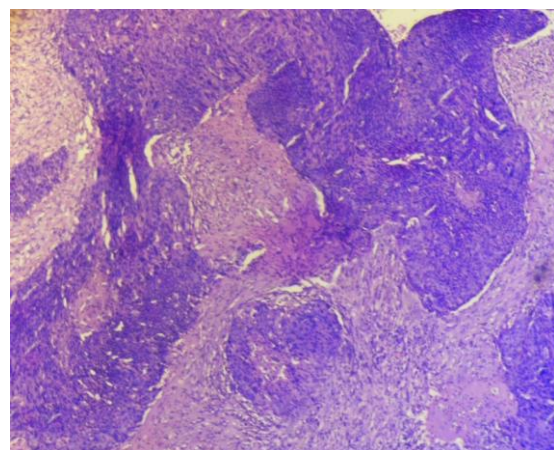


Fig-5: Squamous cell carcinoma cervix

Table-1: Distribution of cases in Pap smear

Cytology diagnosis	Distribution of cases(n=377)	
	No of cases	Percentage%
NILM	322	85
ASCUS	12	3.1
LSIL	23	6.1
HSIL	17	4.5
SCC	3	0.7

Table-2: Distribution of cases in cervical biopsy

Biopsy diagnosis	Distribution of cases(n=377)	
	No of cases	Percentage%
Chronic cervicitis	325	86
CIN-1	22	5.8
CIN-2	10	2.6
CIN-3	14	3.7
SCC	6	1.5

Table-3: Cyto-histopathological correlation

Histopathological diagnosis	No of cases	Cytological diagnosis				
		NILM	ASCUS	LSIL	HSIL	SCC
Chronic cervicitis	325	322	3	-	-	-
CIN-1	22	-	9	13	-	-
CIN-2	10	-	-	10	-	-
CIN-3	14	-	-	-	14	-
SCC	6	-	-	-	3	3
Total	377	322	12	23	17	3

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%

DISCUSSION

Pap smear is accepted worldwide as the best screening tool in cervical cancer screening programmes [4]. Although the sensitivity and specificity of the present study were 81.3% and 92% respectively, 3 cases of SCC were underdiagnosed as HSIL on pap smear. Also 10 cases of CIN-2 were underdiagnosed 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 blood. Collecting material for cytology with an endocervical brush and the new Pap smear screening techniques using liquid based cytology (thin-prep Pap, autocyte PREPTM System) appear to increase sensitivity as this techniques prevent air drying artifact, have minimum background material and increase the cellularity. It also offers the possibility of HPV, DNA testing with hybrid capture technology which appears to be most cost effective [5]. 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% [6]. The diagnostic accuracy of the present study was 84.5% which was in comparison to study done by Jain V *et al.*, [7] in 2010 in which diagnostic accuracy was 73.2%. 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%. 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.*, [9] 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 3 cases and they were later on upgraded as squamous cell carcinoma. According to Abli *et al.*, [10] differentiation of regenerative changes from neoplastic lesions in PAP smear requires taking a biopsy only after 3 positive results in cases where ASCUS is found. 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

In conclusion we believe that the success of screening for cervical cancer is based on collection of adequate materials and correct interpretation of abnormal cells. Therefore better awareness, motivation programs alongwith the use of thin-Prep Pap liquid based cytology technique to reduce inadequate sampling errors and the HPV, DNA testing for early detection of cervical lesions is recommended for a virtual 100% prevention of cervical cancer in the years to come.

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