

Correlation of Cervical Pap Smear with Histopathological Diagnosis in Cervical Lesions: A 2 Years Retrospective Study

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ABSTRACT

Introduction: Cervical cancer is one of the most common forms of cancer worldwide. In developing countries, cancer of uterine cervix is ranked second with a relative frequency of 15% of all cancers in women. Screening women with regular Pap smears allows diagnosis of treatable pre-invasive lesions. The objective of the study was to correlate the Pap smear diagnosis with histopathology and to know the accuracy of Pap smears, so as to assess the efficacy of Pap smears in diagnosing cervical lesions.

Material and methods: This two year retrospective study was done in the department of Pathology in a tertiary care centre, which includes 250 Pap smears for which histopathological diagnosis was also done. Detailed clinical history of patients was taken from requisition forms received in cytology department along with Pap smears. The cervical biopsies or hysterectomies received from the same patients were also studied and then correlated with the diagnosis of Pap smears.

Results: Out of 250 Pap smears, maximum patients (32%) belonged to the age group of 41-50 years and were multipara. Maximum cases were reported as NILM (59%), followed by ASCUS (16%), LSIL (15%), HSIL (7%), squamous cell carcinoma (1.6%) and 0.8% cases of adenocarcinoma were diagnosed. On histopathology, 41.2% cases were diagnosed as chronic cervicitis, 27.2% cases as chronic cervicitis with squamous metaplasia, CIN I (22.4%), CIN II (4.0%), CIN III (2.8%), squamous cell carcinoma (1.6%) and (0.8%) cases of adenocarcinoma. Overall sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy was 75.24%, 97.98%, 96.20%, 85.38% and 88.8%.

Conclusion: As per our study, maximum number of cases diagnosed on Pap smears correlated on histopathology, thereby concluding that Pap smears have an important role in diagnosis of cervical lesions.

Keywords: Cervix, Pap Smears, Cytology, NILM, LSIL, HSIL

history of progression from mild dysplasia to carcinoma cervix makes this cancer as relatively early preventable disease and provides the rationale for screening as early cervical epithelial changes can be identified by a Pap smear test, which is the primary screening test for detection of precancerous cervical intraepithelial neoplasia and the early stages of invasive cervical cancer.^{3,4} Pap test is acknowledged world-wide as being the most successful cervical cancer screening test, yet women continue to die of carcinoma of the cervix, because of unawareness of people.⁵ Pap smear is a simple, safe, non invasive, outdoor and effective method for detection of lesions of the cervix. Cervical biopsy, on the other hand is a gold standard but invasive technique.⁶ This study was done to evaluate the pattern of cervical pap smear cytology at a tertiary care hospital and to correlate with histopathological diagnosis and to determine accuracy of pap smears. Cytological and histopathological correlation of cervical smear is best way of internal quality assurance and also sometimes helpful to find out the factors responsible for discrepant cases.⁷ The objective of the study was to correlate the Pap smear diagnosis with histopathology and to know the accuracy of Pap smears, so as to assess the efficacy of Pap smears in diagnosing cervical lesions.

MATERIAL AND METHODS

This was a retrospective study conducted in the Department of Pathology, MMMCH, Solan over a period of two years from March 2016 to March 2018. A total of 400 Pap smears were studied, out of which 250 patients were selected that had undergone both Pap smear and cervical biopsy or hysterectomy. Hence the data score is 250. Detailed clinical history including parity and complaints like discharge through vagina, post coital bleeding, post menopausal bleeding, pain in lower abdomen, intermenstrual bleeding etc. was taken from the requisition forms send along with the samples from the gynaecology department. The Pap

INTRODUCTION

Carcinoma of the uterine cervix is a major health problem faced by the Indian women and other developing countries. There were an estimated 528,000 cases and 266,000 deaths from cervical cancer worldwide in 2012, accounting for 7.5% of all female cancer deaths. India accounts for about 20% of cervical cancer cases reported from the world. Every year in India, 122,844 women are being diagnosed with cervical cancer and 67,477 die from the disease.¹ It is the second most common cancer in women aged 15–44 years. India also has the highest age-standardized incidence of cervical cancer in South Asia.² Cervical cancer is a preventable disease due to the long preinvasive stage. The usual 10-20 years of natural

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smears were taken with the Ayer's spatula on a clean glass slide and fixed immediately in 95% ethanol and ether equal parts. Staining of the slides was performed by means of the conventional Pap staining. Pap smears were reported as per the Bethesda System 2001 classification. The cervical biopsies or hysterectomy specimens received from the same patients were fixed in 10% neutral buffered formalin solution and processed routinely with final embedding in paraffin blocks and stained with haematoxylin and eosin (H and E) stain. The histopathological findings were correlated with Pap smear findings taking histopathological diagnosis of biopsies as the gold standard.

Inclusion criteria

- Sexually active married women
- Discharge from vagina, abdominal pain, irregular menstrual bleeding, post menopausal bleeding and post coital bleeding

Exclusion criteria

- Unmarried women

- Women without sexual exposure
- Pregnant women
- Unsatisfactory smears

STATISTICAL ANALYSIS

Information about patients obtained from requisition forms and their cyto-histopathological diagnosis were taken in the tabulated form and statistically analysed. Sensitivity, specificity, positive predictive value, negative predictive value and accuracy were calculated considering histopathological diagnosis of cervical biopsy as the gold standard.

RESULTS

A total of 250 pap smear cases were studied which also undergone biopsy or hysterectomy during the period from March 2016 to March 2018 retrospectively. Most of the patients (32%) were in age group of 41-50 yrs and belong to para 2 (40%) followed by para 3 (24.8%). The majority of patients presented with complaints of whitish discharge per

Cytological diagnosis	No. of cases on Pap smear(%)	Chronic cervicitis	Chronic cervicitis with squamous metaplasia	CIN I	CIN II	CIN III	Adeno Carcinoma	SCC
NILM	149 (59.6)	99	47	3	-	-	-	-
ASCUS	39 (15.6)	4	17	18	-	-	-	-
LSIL	37 (14.8)	-	3	34	-	-	-	-
HSIL	19 (7.6)	-	1	1	10	7	-	-
SCC	4 (1.6)	-	-	-	-	-	-	4
Adeno-Carcinoma	2 (0.8)	-	-	-	-	-	2	-
Total (%)	250 (100)	103 (41.2)	68 (27.2)	56 (22.4)	10 (4.0)	7 (2.80)	2 (1.6)	4 (0.8)

Table-1: Cyto-histopathological correlation of Pap smears and cervical biopsies/ hysterectomies

Histopathology Pap smear	Positive	Negative	Total
Positive	76	25	101
Negative	03	146	149
Total	79	171	250

Table-2: Correlation between Pap smear and histopathological diagnosis

Sensitivity	75.24%
Specificity	97.98%
Positive predictive value (PPV)	96.20%
Negative predictive value (NPV)	85.38%
Accuracy	88.80%

Table-3: Sensitivity and Specificity of Pap smear

Study	Sensitivity (%)	Specificity (%)	Positive predictive value(PPV) (%)	Negative predictive value (%)	Accuracy (%)
Present Study	75.24	97.98	96.20	85.38	88.80
Patil et al ⁸ (2016)	77.7	84.2	70.0	88.8	82.1
Bamanikar et al ⁹ (2016)	89.47	88.70	82.92	-	-
Dhakal et al ¹⁰ (2016)	77.80	100	100	97	-
Atla et al ¹¹ (2015)	94.11	64.28	82.75	85.0	83.33
Joshi et al ¹² (2015)	65.38	95.83	94.4	71.8	80.0
Chaudhary et al ¹³ (2014)	79.37	81.02	65.79	89.52	-

Table-4: Comparison of present study with similar studies

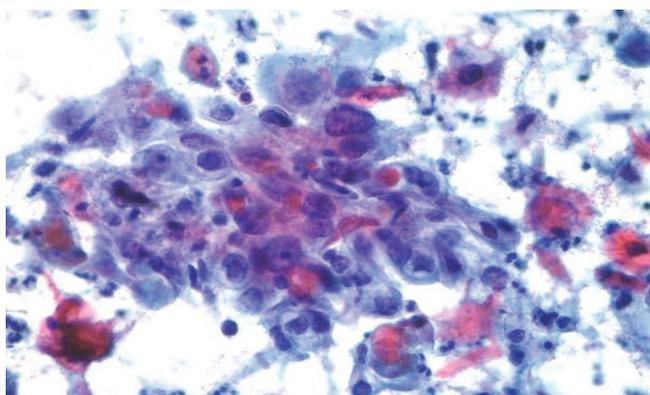


Figure-1: Shows Pap smear diagnosed as squamous cell carcinoma

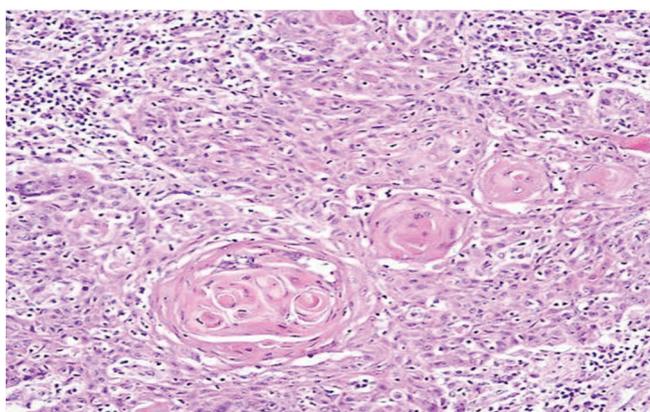


Figure-2: Shows cervical biopsy exhibiting features of squamous cell carcinoma

vaginum (46%) and pain lower abdomen (30%) followed by intermenstrual bleeding, menorrhagia, postcoital bleeding and postmenopausal bleeding in 23.25%, 19.2%, 9.2% and 2.4% cases respectively.

According to the Pap smear findings out of 250 cases, maximum number of cases 149 (59.6%) were categorised as Negative for Intraepithelial lesion or malignancy (NILM). Epithelial cell abnormalities (ECA) were found in 101 cases (40.4%). Most common epithelial cell abnormality was Atypical squamous cells of undetermined significance (ASCUS) seen in 39 (15.6%) cases followed by low grade squamous intraepithelial lesion (LSIL) and high grade squamous intraepithelial lesion (HSIL). 6 cases (2.4%) of malignancy were reported which included 4 (1.6%) cases of squamous cell carcinoma and 2 (0.8%) cases of adenocarcinoma (Table1) (Figure1).

According to histopathological diagnosis of biopsies or hysterectomies, out of 250 cases 41.2% cases were diagnosed as chronic cervicitis, followed by chronic cervicitis with squamous metaplasia (27.2%), CIN I (22.4%), CIN II (4.0%) and CIN III (2.8%). Malignancy was diagnosed in 6 patients which includes 4(1.6%) cases of squamous cell carcinoma and 2 (0.8%) cases of adenocarcinoma (Table 1) (Figure2).

As per our study, maximum number of cases 222/250 (88.8%) diagnosed on Pap smears correlated on histopathology, thereby concluding that Pap smears have an important role in screening different types of cervical lesions (Table 2).

Sensitivity, specificity, positive predictive value, negative

predictive value and accuracy of pap smear was 75.24%, 97.98%, 96.20%, 85.38% and 88.8% respectively (Table 3).

DISCUSSION

Malignant lesions of the cervix have a long premalignant latent phase which precedes the invasive disease and can be detected on cytological examination and are treatable. In the present retrospective study 250 cases were studied for cervical cytology and to find its correlation with histopathological diagnosis. Findings were recapitulated and compared with the results of other studies.

In our study, the majority of patients were of the age group of 41-50 years(32%) which was comparable to other studies done by Joshi et al⁸ (50%), Bamanikar et al⁹ (28.46%) and Parija et al¹⁰ (37.15%) and belong to para 2(40%) which was similar to studies done by Atla et al.¹¹ The commonest complaint was whitish discharge per vaginum (46%) which was similar to studies done by Joshi et al⁸ (40%), Atla et al¹¹(41%), Dhakal et al¹² (40%) and Alakananda et al¹³ (51%). NILM(59.6%) was similar to studies done by Alakananda et al¹³ (55%), Atla et al¹¹ (53%) and Joshi et al⁸ (64%) but differ from Malpani et al¹⁴ (97.96%) because in our study sample size was small and moreover we have patients mostly with specific complaints and not came for routine screening. In our study 98% cases of NILM on Pap smear correlated on histopathology which was comparable to the studies done by Atla et al¹¹ (93%) and Alakananda et al¹³ (91%).

The incidence of Epithelial cell abnormality (ECA) in the present study was seen in 40.4% cases which was higher when compared to studies by Malpani et al¹⁴ and Sachan et al³ but similar to study by Alakananda et al¹³ as this can be attributed to the fact that we had small sample size and patients with specific complaints were included in this study.

In our study 46.15% cases of ASCUS correlated on histopathology which revealed CIN I on biopsy findings while 53.85% cases revealed cervicitis with or without metaplasia similar to studies by Alakananda et al¹³ (45%). The reason behind this discrepancy of cytology on histopathology was that those cases had cervical erosions or ulcers, hence there was inflammatory atypia and these cells on Pap smears were considered as atypical squamous cells.

In our study, 91.8% cases of LSIL correlated with histopathological diagnosis which was similar to other studies.¹¹ Out of 37 cases of LSIL, 34 cases showed CIN I while 3 cases showed chronic cervicitis with metaplasia. All cases of HSIL correlated with the cervical biopsy diagnosis which was comparable to the diagnosis made by Atla et al¹¹ (99%).

On Pap smears 2 cases and 4 cases were diagnosed as adenocarcinoma and squamous cell carcinoma respectively which showed 100% correlation on histopathology.

In our study, the overall accuracy in our study was comparable to Atla et al¹¹ (83.33%), Patil et al¹⁵ (82.1%) and Joshi et al⁸ (80.0%) (Table 4). This study shows a good correlation between Pap smear and cervical histology.

CONCLUSION

Pap smear test is sensitive and cost effective modality for screening premalignant and malignant lesions of cervix. Cytological features significantly correlate with histopathological findings. Thus, screening procedures should be implemented in early age in sexually active females to detect the lesions in an early stage and appropriate management. Community should be educated about the Pap smear test, including its goal and the required frequency of screening, by widespread educational and media programs to help prevent mortality and morbidity due to cervical cancer.

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