Original Article

Cytohistological correlation of conventional Papanicolaou smears in cervical neoplasia at a tertiary care hospital of Nepal

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ABSTRACT

Background: Conventional Cervical Cytology is the most widely used cervical cancer screening test. The incidence of cervical carcinoma is incredibly high in developing countries due to lack of proper knowledge. The extensive use of cervical screening with Papanicolau smears had considerably increased the detection of precancerous and cancerous lesion of uterine cervix. Study was conducted to evaluate cytohistological correlation and to calculate concordance and discordance of Pap smear in detection of precancerous and cancerous lesions of uterine cervix.

Materials and Methods: A total of 54 samples reported in Pap smear as cervical intraepithelial lesions and suspicious for invasive malignancies were selected and correlated with corresponding histopathological findings. It was an observational study done for a period of 18 months from November 2016 to May 2018. All the statistical evaluation was done by using SPSS version 20.

Results: During the study period 54 cases were evaluated. Atypical Squamous Cell of Undetermined Significance was the common abnormal findings in the Pap smear with frequency of 26 (48.1%). Out of total 54 cases of Pap smears, 30 (55.55%) were concordant while discrepancies occurred in 24(44.44%) cases with cervical biopsy

Conclusions: The study revealed a good correlation between cervical cytology and cervical biopsy. We also concluded that conventional Pap smear is a cost effective test for the early detection of precancerous and cancerous cervical lesions.

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INTRODUCTION

Cervical cancer is fourth common cancer affecting women and also fourth common cause of cancer death in women, worldwide. Seventy percent of it occurs in developing countries.[1] However, it is most common cancer among Nepalese women.[2] According to the International Agency for Research on Cancer, the incidence of cervical cancer can be reduced by 90 % through periodic screening.[3] The human papillomavirus (HPV) plays a central role in cervical carcinogenesis, and around it revolve various factors that directly or indirectly influence whether or not changes in the cervical squamous epithelium occurs that can evolve into

cancer. Among the factors most studied are immunological factors, smoking, age, pregnancy (multiple child birth), use of hormonal contraceptives and microbiota.[4]

Cervical cytology has been successful in reducing the incidence and mortality but several reviews of the efficacy of cervical cytology suggested a high false negative rate because of the error occurring at various stages like sampling preparation, interpretation of cervical smears.[5] The uterine cervix, being the most exposed part of the female reproductive system, is more vulnerable to get diseased, particularly in peri- & post-menopausal age group women. The lesion may be inflammatory, pre-neoplastic and neoplastic. Neoplastic as well as preneoplastic lesions if detected in time can be treated. The treatment is effective in reducing the chance of progression to malignant disease.[6]

Pap smear is a screening test only. Positive test requires further investigation like colposcopy, cervical biopsy and fractional curettage. Pap smear can detect 70-95% of cancer of the cervix and about 70% of endometrial cancer shown in different studies.[7] Monitoring cytohistologic discrepancies is a useful quality assurance tool in cytology laboratory. As a part of continuous quality improvement program, cytohistologic correlation may help laboratories to refine diagnostic criteria and improve diagnostic accuracy and reproducibility.[8] Although high-risk Human Papillomavirus (HR-HPV) test and HPV genotyping have certain role in cervical cancer screening nowadays, these tests are not widely available in developing countries. Cervical cytology is still the principal screening method.[9]

Hence, this study was undertaken to classify lesions of abnormal Pap smear according to The Bethesda System 2014 and to study the concordance and discordance between abnormal Pap smear findings and corresponding histopathological findings.

MATERIALS AND METHODS

 This is a hospital based analytical study conducted among patients attending Obstetrics/Gynaecology(OBS/GYN) outpatient department(OPD) and inpatient department(IPD) at UCMS-TH, Bhairahawa, Nepal whose cervical biopsy was taken to correlate precancerous and cancerous cervical lesion on Pap smear. The ethical approval for study was taken from Institutional Review committe, Universal College of Medical Sciences (UCMS-TH) before sample collection.

Correlation study between Pap smear findings and cervical biopsies findings over an 18 months period from November 2016 to May 2018 were conducted in patients suspected as premalignant or malignant cervical lesion.

Cervical exfoliative cytology slides were transferred directly from alcohol -ether fixative without drying and stained with conventional Papanicolau staining technique. Cervical biopsy specimen were fixed in formalin (10%), processed and stained with Hematoxylin and Eosin for histopathological examination. Abnormal cervical Pap smear findings were reported as per guidelines by The Bethesda System 2014 and biopsies were advised for correlation.

For the purpose of calculating concordant and discordant cases following entities were considered equivalent:

• ASCUS in Pap smear was considered concordant with HPE diagnosis of CIN I/ Koilocytic atypia.

• LSIL in Pap smear was considered concordant with HPE diagnosis of CIN I/ Koilocytic atypia.

• HSIL in Pap smear was considered concordant with HPE diagnosis of CIN II/CIN III.

• HSIL suspicious of invasion was considered concordant with HPE diagnosis of SCC.

The study population consisted of women with abnormal Pap smear findings who underwent cervical biopsy examination excluding all the cases of Negative for Intraepithelial Lesion or Malignancy (NILM). Statistical analysis was performed using Microsoft Excel 2010 and SPSS version 20.

RESULTS

A total of 54 cases were enrolled in the study. All these patients had abnormal Pap smear finding that felled in category of Epithelial Cell abnormality according to the criteria of TBS-2014. All patients were interviewed in detail as per proforma. The data recorded were analyzed statistically and following observations and results were obtained.

Among the study population Atypical squamous cell of undetermined significance was the most common abnormal findings (n=26;48.1%) followed by LSIL (n=19; 35.2%) and HSIL (n=6; 11.1%). HSIL with suspicious of invasion was the least common seen only in 3 (5.6%) cases.

Out of 26 cases of ASCUS, 14 cases were diagnosed as chronic cervicitis followed by 10 cases of CIN I. (Table 1) Five cases of LSIL cases in Pap smears were CIN II in biopsy specimen. All 3 suspicious cases of invasive carcinoma in Pap smears were invasive squamous cell carcinoma. (Table1) When the cyto-histological diagnoses were correlated, it was found that all 3 cases of HSIL suspicious of invasion were concordant with histopathological diagnosis of squamous cell carcinoma followed by HSIL in which 4 out of 6 cases were concordant with HPE diagnosis of CIN II. (Table 2) Out of total 54 cases, 30 (55.55 %) were concordant while discrepancies occurred in 24 (44.44 %)

Table 1: Comparison between histopathological diagnosis with pap smear (n=54).

		Histopathological diagnosis					Total
		Chronic Cervicitis	Koilocytic atypia	CIN I	CIN II	Squamous Cell Carcinoma	
PAP smear diagnosis	ASCUS	14	2	10	0	0	26
	LSIL	2	0	11	5	1	19
	HSIL	1	1	0	4	0	6
	suspicious of invasion	0	0	0	0	3	3
Total		17	3	21	9	4	54

Table 2: Concordance and discordance cases between Pap smear and cervical biopsy in different categories (n=54).

Pap Smear Diagnosis	Concordant Cases	Discordant Cases	Total cases
ASCUS	12	14	26
LSIL	11	08	19
HSIL	04	02	06
HSIL SUSPICIOUS OF INVASION	03	00	03
TOTAL	30 (55.55%)	24(44.44%)	54 (100%)

cases which is shown in table 2.

When discrepant cases were analyzed it was found that 14 cases of ASCUS, 2 cases of LSIL and 1 case of HSIL on Pap smear, 3 were downgraded as Chronic cervicitis on cervical biopsy. Similarly, 5 cases of LSIL were upgraded as CIN II and 1 case was upgraded as SCC. One case of HSIL was downgraded as Koilocytic atypia on histopathology.

DISCUSSION

Cancer cervix is considered to be an ideal gynecological malignancy for screening as it meets both test and disease criteria for screening. It has a long latent phase during which it can be detected as identifiable and treatable premalignant lesions which precede the invasive disease and the benefit of conducting screening for carcinoma cervix exceeds the cost involved.[10]

In this study, among abnormal Pap smear findings ASCUS was most common accounting for 48.1 % of cases. Similar results were seen in study by Fazia HAQ Nwaz et al,[11] Chaudhary RD et al,[12] Yeoh G et al.[13] and Bodal V et al.[14] where most common abnormal Pap smear finding was also ASCUS accounting for 47.08%, 50.0 % , 65.9 % and 25.67 % cases respectively.

Whereas in studies by Naik R et al,[4] Jyothi R et al,[15] Sachan PL et al.[16] Jones B et al,[17] Vidhyadhar S et al.,[18] Verma I et al,[19] Malpani G et al,[10] Joshi C et al,[20] Laxmi RC et al[21], Meenai FJ et al.[22] and Bhavani K et al.[23] most common epithelial cell abnormality was LSIL accounting for 45 %, 48.93%, 60%, 62.5%, 38.88%, 41.7%, 28.16%, 47.22%, 49.43%, 33.92% and 44.26% respectively among all pre invasive and invasive cases. Contrast to all of these studies including our study, HSIL was the most common epithelial cell abnormality in study by Dhakal R et al.[24]

In the present study, most common HPE diagnosis among women with abnormal Pap smear diagnosis is CIN I which accounts for 39 % of cases. Similar findings with most common HPE diagnosis of CIN I in women with abnormal Pap smear were observed in studies by Vidhyadhar S et al,[18] Malpani G et al,[25] accounting for 54.68% and 26.05 %, cases respectively. Contrary to these, SCC was most common HPE findings among women with abnormal Pap smear accounting for 69.5 % of cases in a study by Vaishali Jain et al.[26]

Even though we excluded the NILM cases in Pap smear, we still found 31.5 % cases of chronic cervicitis. Similar type of findings were also observed in a study by Meenai FJ et al.[22] where even after excluding NILM in Pap smear 49 (17.5 %) cases of chronic cervicitis, single case of chronic cervicitis with squamous metaplasia and 6 cases of papillary endocervicitis were found.

In our study, 4 cases of SCC were observed in HPE accounting for 7.4 % of total cases. Similar finding was seen in a study by Laxmi RC et al.[21] where SCC accounts for 8.98 % of cases in women with abnormal Pap smear. Whereas in a study by V. Bodal et al.[14] and Jain V et al,[26] SCC accounts for 35.13 % and 69.5 % cases respectively among women with abnormal Pap smear.

In the present study 68.51 % of women with abnormal Pap have abnormal histopathology of CIN and SCC. Similarly, in a study by Sahida Akhter et al.27 58.3 % of patients had abnormal histopathology.

Twelve cases of ASCUS correlated with CIN I/Koilocytic atypia and 14 cases were downgraded as chronic cervicitis in the present study. Similar finding was also observed in a study by Meenai F J et al.[22] where 55 cases belonging to ASCUS category reported on cervical cytology were

diagnosed as CIN I (27 cases), 24 cases were downgraded as chronic cervicitis and 4 cases were upgraded as CIN II on cervical biopsy.

In a study by Ramadevi E et al.[28] Pap smear correctly estimated CIN in 78%, underestimated in 10 % and overestimated in 12 % of cases. Whereas in our study Pap smear correctly estimated CIN in only 60 % of cases, underestimated in 16 % and overestimated in 24 % of cases.

In this study for diagnosis of SCC in cervical biopsy three out of four cases had previous Pap diagnosis of HSIL suspicious of invasion. Similar finding was observed in a study by Miller RA et al.[29] where for diagnosis of SCC most frequently observed previous Pap test diagnosis was HSIL or above before or at the time of tissue diagnosis.

Concordance rate for SCC in our study was 100 percent. It is consistent with a study by Naik R et al4 where concordance rate for malignancy was 100 percent. Whereas in a study by Vaishali Jain et al.[26] corcordance rate for SCC was 83.6 % and in a study by Meenai FJ et al.[22] concordance rate for SCC was 90.47 percent.

In our study concordance and discordance between Pap smear and HPE diagnosis is 55.55 % and 44.44 % respectively. In other studies concordance is quite higher than our study. In a study by Meenai FJ et al.[22] total number of concordant cases were 68.57% and discordant cases were 31.43 % respectively.

Similarly, in a study by Vaishali Jain et al.[26] overall concordance rate was 70.7 % and concordance of cytology and histopathology was 89.3 % in a study by Jyothi R et al.[15]

CONSLUSION

Pap smear is important screening tools for detection of precancerous and cancerous cervical lesions of the cervix. However, it is necessary to perform cervical biopsy which is gold standard if any epithelial abnormalities are detected in cervical cytology for confirmation. The study revealed a good correlation between cervical cytology and cervical biopsy. In the present study, we have correlated abnormal Pap smear findings with that of HP diagnosis, considering HPE as gold standard. We conclude that conventional Pap smear is a cost effective method for early detection of premalignant and malignant cervical lesions and secondary prevention of carcinoma cervix.

Conflict of interest: None

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