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HISTOPATHOLOGICAL SPECTRUM OF PREMALIGNANT AND MALIGNANT LESIONS OF UTERINE CERVIX: A ONE YEAR STUDY IN A TERTIARY CARE CENTRE IN ASSAM

Pathology

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ABSTRACT

Introduction: Cervical cancer is one of the leading causes of cancer-related morbidity and mortality among women in developing countries. Early detection and diagnosis of premalignant lesions through histopathology play a critical role in reducing disease burden. **Objective:** To analyse the histopathological spectrum of premalignant and malignant lesions of the cervix and to determine their frequency and age distribution. **Materials and Methods:** This retrospective study was conducted in the Department of Pathology, Assam medical college and Hospital, Dibrugarh, over a period of one year. A total of 80 cervical biopsy specimens were analysed. The tissues were routinely processed, stained with hematoxylin and eosin, and examined microscopically to categorize lesions as premalignant or malignant. **Results:** Out of 80 cases, 5 cases were premalignant lesions and 75 were malignant. Among premalignant lesions, cervical intraepithelial neoplasia, CIN-I (3.75%) was the most common, followed by CIN-III (2.5%). Among the malignant lesions, squamous cell carcinoma was predominant (83.75%) followed by adenocarcinoma (6.25%), Neuroendocrine carcinoma (2.5%) and adenosquamous carcinoma (1.25%). **Conclusion:** Cervical cancer remains the leading cancer among women in developing countries. Histopathological evaluation is regarded as the gold standard for diagnosing cervical intraepithelial neoplasia and carcinoma. Early detection through histopathology is crucial for ensuring timely treatment, improving prognosis, and preventing progression to invasive cervical cancer.

KEYWORDS

Cervix, SCC, Adenocarcinoma, Neuroendocrine Carcinoma, Adenosquamous

INTRODUCTION

Cervical cancer ranks as the second most prevalent cancer among women globally, claiming the lives of nearly 250,000 women each year. In India alone, approximately 1,30,000 new cases are reported annually, accounting for 86–90% of all gynecological malignancies.[1,2] The transformation zone of the cervix, particularly the area near the squamo-columnar junction, is highly susceptible to infection by Human Papillomavirus (HPV). Persistent infection with high-risk HPV types is a key causal factor in cervical cancer development, though additional cofactors also contribute to carcinogenesis. Specific epithelial cells within the transformation zone are believed to play a central role in the onset of cervical neoplasia.[3] Accurate diagnosis of cervical intraepithelial neoplasia (CIN) is essential for effective cervical cancer prevention; however, histological interpretation can often be challenging and inconsistent. A practical approach to grading CIN involves assessing whether basaloid cell proliferation involves less or more than half of the epithelial thickness, which may offer better reproducibility and clinical relevance.[1] Invasive cervical cancers can exhibit squamous, glandular (columnar), or neuroendocrine differentiation, along with various other forms such as adenosquamous, glassy cell, sarcomatoid, lymphoepithelioma-like, transitional, and undifferentiated types. These diverse patterns of neoplastic differentiation likely reflect either the nature of the cells initially infected by HPV or the differentiation pathways activated during tumor development. Pathological features such as depth of invasion, status of surgical margins, and evidence of lymphovascular invasion are vital for guiding patient management.[4] This study aims to analyze the histopathological spectrum of cervical carcinomas and their precursor lesions, classify them per WHO guidelines, document accompanying morphological features, and evaluate their grades.

AIM

To analyse the histopathological spectrum of premalignant and malignant lesions of the cervix and to determine their frequency and age distribution.

MATERIALS AND METHODS

The retrospective study was done at Department of Pathology, Assam Medical College and Hospital, Dibrugarh, Assam over a period of 1 year from 1st January 2024 to 31st December 2024. A total of 80 cases of cervical biopsies was taken. In each case, a brief history and physical examination was done and relevant investigation was carried out. All histologically confirmed premalignant and primary malignant lesions of the uterine cervix were included in this study. Cases with non-neoplastic lesions, benign tumors, and secondary (metastatic) tumors involving the cervix were excluded. Cervical biopsy and hysterectomy specimens received were first fixed in 10% formalin. Gross features were noted, and the specimens were then processed as follows:

A) Cervical biopsy specimens were entirely embedded.
B) In cases where the cervix showed no gross abnormalities, representative sections were taken from both the anterior and posterior walls, ensuring inclusion of the squamocolumnar junction.

The tissues were processed routinely to obtain 4-5 microns thick paraffin sections and stained with Haematoxylin and Eosin. Cervical lesions were categorized as premalignant or malignant and further subtyped based on the World Health Organization (WHO) histological classification of tumors of the uterine cervix.[5] The histopathological parameters assessed included: the pattern of invasion, nuclear pleomorphism, nature of the tumor-stromal interface or mode and extent of invasion, intensity of stromal inflammatory infiltrate, presence or absence of lymphovascular invasion, mitotic activity, and the degree of tumor differentiation.

RESULTS:

Table:1. Age Distribution of Cervical Lesions:

Age Group (in years)	Number (n)	Percentage (%)
Upto 30	4	5.00
31–40	11	13.75
41–50	28	35.00
>50	37	46.25
TOTAL	80	100.00
Mean ± S.D.	50.53 ±10.76 years	

In our study, both premalignant and malignant lesions were observed from the age group of 15 years, patients were classified into 4 groups: upto 30 years, 31-40 years, 41-50 years, > 50 years. In our present study, most cervical lesions were observed in the age group of >50 years of age followed by 41-50 years of age.

Table 2: Parity Distribution

Parity	Number (n)	Percentage (%)
Nulliparity	3	3.75
1–2	39	48.75
>2	38	47.50
TOTAL	80	100.00

In our present study, when the cases were distributed in relation to parity, it was observed that the number of cases with parity of 1-2 and >2 were almost the same constituting 48.75% and 47.50% respectively

Table 3: Symptoms Observed in Both Premalignant and Malignant Lesions:

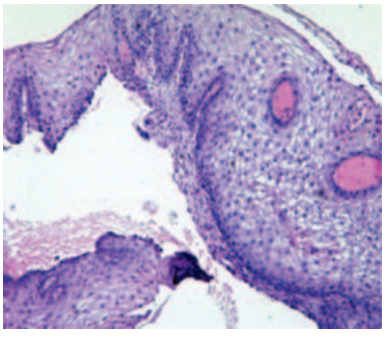
Symptoms	Number (n=80)	Percentage (%)
Cervical Growth (per speculum examination)	70	87.50
White Discharge	63	78.75
Post Menopausal Bleeding	46	57.50
Post Coital Bleeding	34	42.50
Menorrhagia	26	32.50

In our study when the number of cases was classified based on the presenting symptoms, most cases presented with white discharge (78.75%) followed by post menopausal bleed seen in 57.50% of cases. On per speculum examination 70 cases out of 80 (87.50%) showed a growth on the cervix.

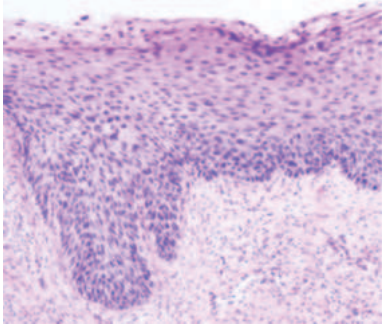
Table 4: Distribution of Cases Based on HPE Diagnosis:

HPE Diagnosis	Number (n)	Percentage (%)
CIN-I	3	3.75
CIN-II	0	0.00
CIN-III	2	2.50
Squamous Cell Carcinoma	67	83.75
Adenocarcinoma	5	6.25
Others:		
• Adenosquamous Carcinoma	1	1.25
• Neuroendocrine Carcinoma	2	2.5
TOTAL	80	100.00

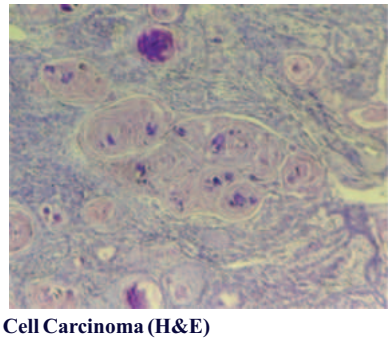
In our study, the cases were distributed based on the histopathological diagnosis, and it was observed that 3 cases of CIN-I (LSIL), 2 cases of CIN-III (HSIL), 67 cases of Squamous cell carcinoma, 5 cases of Adenocarcinoma, 1 case of Adenosquamous carcinoma and 2 cases of neuroendocrine carcinoma was noted.



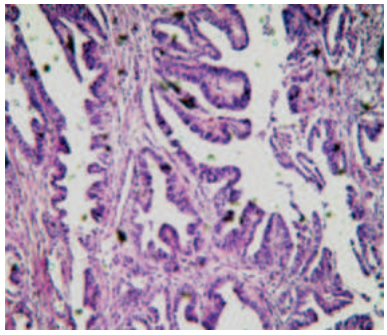
LSIL (CIN-I; H&E)



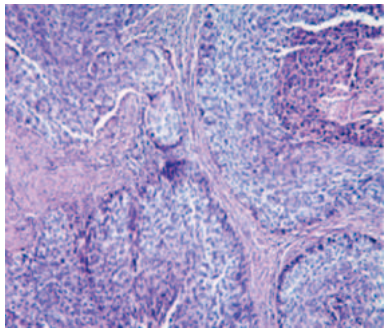
HSIL(CIN-III; H&E)



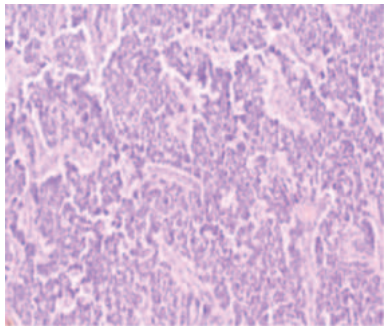
Squamous Cell Carcinoma (H&E)



Adenocarcinoma of Cervix (H&E)



Adenosquamous Carcinoma of Cervix(H&E)



Neuroendocrine Carcinoma of Cervix (H&E)

DISCUSSION

Cervical cancer is one of the leading causes of morbidity and mortality among women worldwide. Numerous investigations demonstrated the connection between human infection with the papilloma virus in cervical cancer, both invasive and precancerous. The majority of HPV infections are temporary; if they continue, there is a chance that increases in preneoplastic lesions and the chance of developing cervical cancer.[6]

In our study, age group above 50 years were the most commonly affected followed by 41-50 years women with a mean age of 50.53 years and median was 50 years. The present observation almost aligns with the findings of a study conducted by Umar et al., showing a mean age of 53.2 years. The youngest age in our study was 25 years and the oldest was 82 years which almost aligns with the data given by Umar et al., where the youngest age was 27 years and the oldest was 80 years.[7]

Majority of the patients in our present study were multipara with highest parity of 6. Many studies have shown a correlation between multiparity and cervical cancer.[8] In the meta-analysis conducted by Tekalegn et al., it revealed that women with high parity had 2.65 times higher odds of developing cervical cancer compared to their counterpart.[9] In Urmila et al study majority of the patient was parity of > 5 with abnormal cervical smears.[10]

In our present study of 80 cases, the number of premalignant lesions were outnumbered when compared to other studies as only 5 cases of CIN lesions were identified. Of which 3 cases were of CIN-I (LSIL) and other 2 cases were of CIN-III (HSIL). There were 67 cases of SCC, 5 cases of Adenocarcinoma, 1 case of adeno-squamous carcinoma and 2 cases of Neuroendocrine Carcinoma. In a study conducted by Priyadarshini et al. they did a study on 53 samples where 15 cases of

LSIL, only 1 cases of HSIL , and 11 cases of SCC was observed.[11]

CONCLUSION

Cervical cancer remains the most prevalent cancer among women in developing countries. A major advancement in its management has been the recognition that cervical intraepithelial lesions represent progressive stages within a biological continuum that can eventually lead to invasive carcinoma.

Histopathological examination remains the gold standard for diagnosing both intraepithelial neoplasia and cervical cancer. In most cases, diagnosis through light microscopy is adequate, with histochemical stains and immunohistochemistry required only in select instances, such as poorly differentiated carcinomas and neuroendocrine tumors.

Early histological evaluation of intraepithelial neoplasia and cervical carcinoma is crucial for ensuring timely diagnosis, improved treatment outcomes, and effective prevention of invasive disease. With recent progress in molecular diagnostics, further research comparing various histological patterns and biomarkers is essential to support the development of targeted therapies and preventive strategies against invasive cervical cancer.

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