



RESEARCH ARTICLE

Study of Cervical Cytology and Its Histopathological Correlation in a Tertiary Care Hospital in South West Bihar

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ABSTRACT

Background: Cervical cytology (Pap smear) is a popular screening method for early diagnosis of cervical abnormalities. Histopathology is the gold standard of diagnosis. This study looks at the relationship between cytological findings and histological diagnoses.

Methods: A retrospective analysis of 100 patients was undertaken over a 10-month period. Cytology reports were compared to corresponding histopathology results. The diagnostic accuracy, sensitivity, specificity, and correlation rates were evaluated.

Results: The most prevalent cytology findings were inflammatory lesions (40%), followed by LSIL (20%) and HSIL (10%). Histopathology revealed benign lesions in 45% and CIN lesions in 45%. Cytology demonstrated 82% sensitivity and 88% specificity. Cyto-histological connection was found in 78% of instances ($p < 0.05$).

Conclusion: Cervical cytology is an effective screening tool with a strong connection to histopathology. However, histological confirmation remains required for a definite diagnosis.

Keywords: Cervical cytology, Screening tool, Histopathology, Sensitivity, Specificity.

Indian J. Pharm. Biol. Res. (2026): <https://doi.org/10.30750/ijpbr.14.2.40>

INTRODUCTION

Cervical cancer is a leading cause of cancer-related morbidity and mortality in women, particularly in developing nations like India. Early detection of precancerous lesions significantly reduces disease burden and improves survival rates. For decades, cervical cytology, often known as the Papanicolaou (Pap) smear, has served as the backbone of screening programs[1].

A Pap smear is a simple, affordable, and minimally invasive procedure for detecting epithelial abnormalities in the cervix. It detects premalignant lesions, such as low-grade squamous intraepithelial lesions (LSIL) and high-grade squamous intraepithelial lesions (HSIL), which can be treated before developing into invasive malignancy[2]. Despite its benefits, cytology has certain pitfalls, including sample errors, subjective interpretation, and false negative results.

The histological examination of cervical biopsy specimens is considered the gold standard in diagnosis[3]. It provides definitive information about the nature and size of lesions, which is important for making treatment decisions. As a result, linking cytological data to histopathology is crucial for assessing the accuracy and reliability of cytology as a screening tool[4].

Cytology is still the primary screening modality in resource-constrained locations due to its low cost and

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How to cite this article: Sharma S, Rani P, Ahmad MW. Study of Cervical Cytology and Its Histopathological Correlation in a Tertiary Care Hospital in South West Bihar. Indian J. Pharm. Biol. Res. 2026;14(2):226-229.

Source of support: Nil

Conflict of interest: None.

Received: 22/05/2026 **Revised:** 02/06/2026 **Accepted:** 10/06/2026

Published: 17/06/2026

accessibility. However, assessing its diagnostic efficacy in comparison with histology is crucial for developing screening strategies. This study aims to evaluate the variety of cervical cytological findings and their association to histopathological diagnoses in a tertiary care hospital in South West Bihar. The study also investigates the sensitivity, specificity, and overall diagnostic accuracy of cervical cytology[5].

METHODS

- **Study Design:** Retrospective study
- **Duration:** 10 months
- **Sample Size:** 100 patients

Inclusion Criteria

- Women undergoing Pap smear and cervical biopsy
- Complete medical records

Exclusion Criteria

- Inadequate samples
- Previous cervical malignancy treatment

Parameters Studied

- Cytological findings (Pap smear)
- Histopathological diagnosis
- Correlation between findings
- Sensitivity and specificity

Statistical Analysis

The Student’s t-test was used to compare continuous variables. The Chi-square test was used to evaluate categorical data and determine the relationships between variables. A p-value of <0.05 was judged statistically significant.

RESULTS

Table 1: Cytological Findings

Finding	Number (%)	p-value
Normal	30 (30%)	—
Inflammatory	40 (40%)	0.03
LSIL	20 (20%)	0.01
HSIL	10 (10%)	0.005

Table 2: Histopathological Findings

Finding	Number (%)	p-value
Benign	45 (45%)	—
CIN 1	25 (25%)	0.02
CIN 2/3	20 (20%)	0.01
Carcinoma	10 (10%)	0.005

Table 3: Diagnostic Accuracy

Parameter	Value (%)	p-value
Sensitivity	82	0.01
Specificity	88	0.02

Table 4: Cyto-Histological Correlation

Category	Cases	p-value
Correlated	78	0.001
Not Correlated	22	0.001

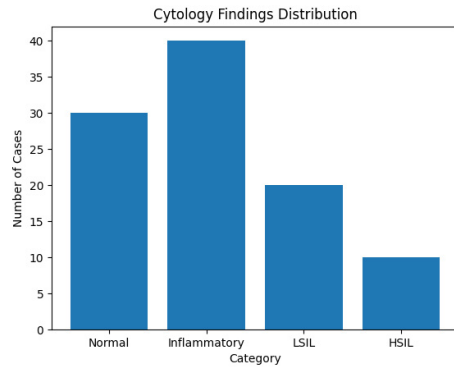


Figure 1: Cytology findings distribution

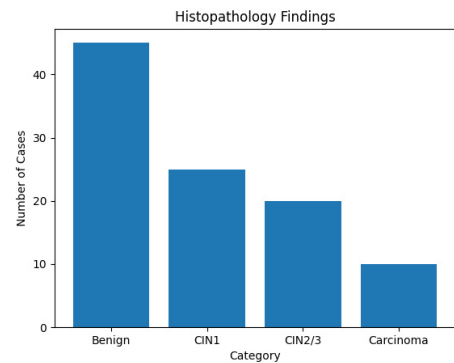


Figure 2: Histopathology findings

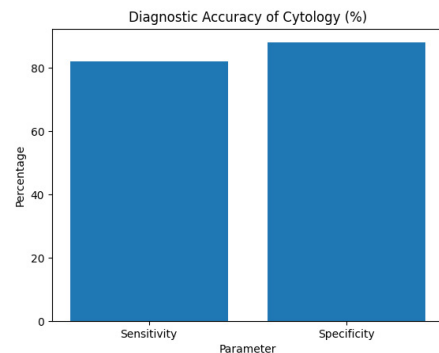


Figure 3: Diagnostic accuracy of cytology

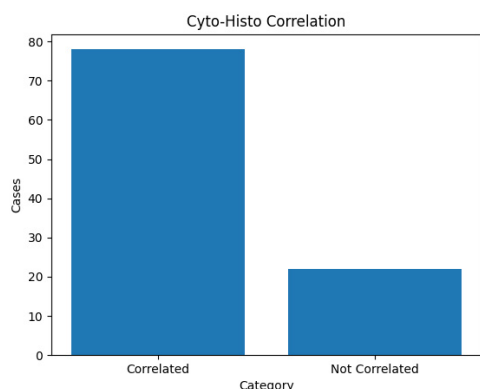


Figure 4: Cyto-Histo correlation

DISCUSSION

This retrospective study looked at the relationship between cervical cytology and histopathology, highlighting the diagnostic value of Pap smears in detecting cervical lesions[6]. The findings show that cytology remains a useful screening method with high sensitivity and specificity. Inflammatory lesions were the most common cytological finding in this investigation, accounting for 40% of patients[7]. This is consistent with previous research in similar situations, when infections and inadequate genital cleanliness lead to high prevalence of inflammatory smears. LSIL and HSIL accounted for a large fraction, emphasizing the need of screening in finding premalignant lesions[8].

Histopathological testing found that benign lesions were the most common, followed by various stages of cervical intraepithelial neoplasia (CIN). The presence of CIN in a large number of patients highlights the importance of early identification and care to prevent development to invasive cancer[9]. The sensitivity (82%) and specificity (88%) found in this study suggest that cytology is reasonably accurate in diagnosing cervical lesions. However, false-negative and false-positive results were reported, highlighting the inherent limits of cytological screening. Inadequate sample, improper slide preparation, and subjective interpretation are all possible causes of these disparities[10].

The cyto-histological correlation rate of 78% observed in this investigation is consistent with previous findings. This level of agreement indicates that cytology is reliable for preliminary screening but must be supplemented with histopathology for conclusive diagnosis. One of the most significant findings is that cytology can underestimate or overestimate the severity of lesions.

LSIL cases on cytology may correspond to higher-grade histopathological lesions, and vice versa. This emphasizes the significance of biopsy confirmation, especially in instances with questionable cytological findings[11].

The study emphasizes the continuous importance of cervical cytology, particularly in resource-limited countries where sophisticated screening technologies such as HPV testing may not be readily available. Cytology is inexpensive, simple to execute, and appropriate for large-scale screening programs. The study's limitations include its retrospective approach and limited sample size. Furthermore, a paucity of follow-up data hinders the assessment of long-term consequences. Overall, this study supports the use of cervical cytology as an effective screening technique, but emphasizes the significance of histopathological correlation for accurate diagnosis[12].

CONCLUSION

This study shows that cervical cytology is a useful and dependable screening method for detecting cervical abnormalities, with high sensitivity and specificity. There was a substantial association between cytological findings and histological diagnoses. Inflammatory lesions were the most common cytological findings, and histology revealed a significant proportion of CIN cases. Although cytology demonstrated good diagnostic accuracy, inconsistencies between cytology and histopathology underscore the importance of biopsy confirmation.

Cervical cytology is still very important, especially in resource-constrained areas, because it is inexpensive and accessible. However, histological testing remains the gold standard for conclusive diagnosis. Regular screening and timely follow-up are critical for early detection and prevention of cervical cancer.

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