Original Article

Early Detection of Cervical Cancer through Pap smears Examination

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Abstract

Background: Cervical cancer is a growing health issue and a leading cause of death for women globally. It can be prevented, if it is identified in the pre-invasive stage and diagnosed with Papanicolaou (PAP) smears at regular intervals. **Objectives:** To examine the early diagnosis of cervical cancer, including inflammatory changes, through Pap smear examination. Methods: This hospital-based cross-sectional study was conducted at the Department of Obstetrics and Gynecology, Sylhet Women's Medical College Hospital, Bangladesh. A total of 157 women who underwent a Pap smear in either the outpatient or inpatient department were examined during the study period. Results: The women were 36.2 ± 11.5 years old on average. The 18–32 age group had a considerably higher prevalence of inflammatory cervical changes (t=39.444, p<0.05). The majority (54.1%) had a history of two or fewer births, and the mean parity was 3.8±1.2. Mild inflammatory changes were seen in 50.3% of the patients, moderate inflammatory changes in 29.9%, and severe inflammatory changes in 19.7%. Age and cervical inflammation were shown to be statistically significantly associated (p p < 0.05). The 18–32 age groups had the highest frequencies of mild, moderate, and severe inflammatory changes (50.6%, 42.6%, and 45.2%, respectively). Cervical inflammation and patient age were also found to be significantly correlated (p < 0.05). Conclusion: This study concludes by screening that inflammatory lesions sort-up a large portion of assessments. Specialists can avoid future dysplasia and create effective management programs with the help of this insight. Early-stage preinvasive lesions and potentially treatable malignancies are now more frequently detected thanks to Pap smear screening.

Keywords: Pap smears, carcinoma in cervix, inflammatory changes, Bangladesh.

Introduction

Cervical carcinoma is a leading cause of death among women in developing countries¹. It is the leading cause of death for women in developing countries and the 2nd most prevalent cancer among women aged 15 to 44². It is responsible for 83% of deaths in developing nations due to social and economic factors^{3,4}. It is a preventable disease due to its prolonged preinvasive stage⁵. Early detection and treatment can reduce morbidity and mortality^{6,7}.

Pap smear is a microscopic examination of cells from the <u>cervix to identify precancerous and cancerous iss</u>ues⁸. It

is primarily used to detect precancerous and cancerous lesions, but it also valuable for identifying inflammatory lesions and their causes, aiding clinicians in managing conditions and preventing further dysplasia⁹. This simple, effective, and versatile test has become an essential part of routine clinical exams, contributing significantly to the workload in gynecological and pathological practice¹⁰. The advantage of this test is that it is a simple, quick, and painless procedure performed on cells scraped from the uterine cervix, widely used as a screening method^{11,12}.

Pap smear test is used to screen asymptomatic women for carcinoma of cervix and has been shown to reduce the

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incidence and mortality rates related with this disease¹³. High parity, early marriage, low socioeconomic condition, and illiteracy are risk factors for cervical lesions¹⁴⁻¹⁶. Comprehensive screening programs must be implemented to reduce mortality among women in both rural and urban areas.

Methods

A hospital-based cross-sectional study was conducted at the Department of Obstetrics & Gynecology, Sylhet Women's Medical College Hospital, Bangladesh, to identify the target population for the early detection of cervical cancer (including inflammatory changes) through Pap smear examination.

Data was collected from the purposively selected 157 patients who attended the hospital for Pap smear test between March and June 2024. The inclusion criteria were women who underwent a Pap smear in the outpatient or inpatient department. The exclusion criteria included unmarried and pregnant women, as well as women who had previously been treated for CIN or cervical cancer.

The data were checked and cleaned followed by making a template, categorizing data, coding and recoding into IBM SPSS v25. The analysis was carried out by using descriptive and inferential statistics, presented with frequency tables and charts.

Before starting the interviews, the researcher obtained informed consent and permission to record from the participants. Participation was voluntary, and participants were informed of their right to withdraw at any time without facing any negative consequences. The confidentiality of the participants was maintained throughout the study. Ethical approval was granted by the Research Ethics Committee of Sylhet Women's Medical College, Sylhet 3100, Bangladesh. All procedures were carried out in accordance with the guidelines of the Declaration of Helsinki.

Results

Table 1 presents the patient profile. Most women (47.1%) were in the 18-32 age groups, followed by 36.9% in the 33-49 age group, and 15.9% aged \geq 50 years. The mean age of the women studied was 36.2±11.5 years. Inflammatory cervical changes were significantly more prevalent within the 18-32 age group (t= 39.444, p<0.005). The mean parity was 3.8±1.2, with the majority (54.1%) having a history of two or fewer births. Cervical inflammation showed no significant association with parity status (p>0.05).

Figure 1 illustrates the types of inflammatory changes observed in the cervix among the women. Half of the patients (50.3%) exhibited mild inflammatory changes, 29.9% had moderate changes, and 19.7% showed severe inflammatory changes.

Table 2 presents the association between patient age and cervical inflammatory changes. A statistically significant relationship was observed between age and cervical inflammation (p=0.021). Mild, moderate, and severe inflammatory changes were most prevalent in the 18-32 age groups, with rates of 50.6%, 42.6%, and 45.2%, respectively.

Table 3 demonstrations the correlation between age and cervical inflammatory changes, revealing a significant association between patient age and cervical inflammation (p<0.05).

| Attributes | | Frequency (n) | Percent (%) | Test of Significance |
|-----------------------|---------|------------------|----------------|------------------------------|
| Age groups (years) | 18-32 | 74 | 47.1 | t= 39.444 p= 0.000 |
| | 33-49 | 58 | 36.9 | |
| | ≥50 | 25 | 15.9 | |
| | Mean±SD | 36.2±11.5 | | |
| Parity (in number) | ≤2 | 85 | 54.1 | $\chi 2=11.254$ p= 0.158 |
| | 3-4 | 46 | 29.3 | |
| | >4 | 26 | 16.5 | |
| | Mean±SD | 3.8±1.2 | | |

Chi-square and one sample t-test done; p<0.05 considered as statistically significant value



Figure 1: Types of inflammatory changes (n=157)

 Table 2: Association of age distribution with their inflammatory changes (n=157)

| | Inflammatory changes | | | Test of | p-value |
|--------|----------------------|----------|----------|--------------|---------|
| | Mild | Moderate | Severe | significance | |
| | n(%) | n(%) | n(%) | | |
| Age gr | oups (in y | ears) | | | |
| 18-32 | 40(50.6) | 20(42.6) | 14(45.2) | 1.123 | 0.021 |
| 33-49 | 28(35.4) | 19(40.4) | 11(35.5) | | |
| ≥50 | 11(13.9) | 8(17.0) | 6(19.4) | | |
| Total | 79(100) | 47(100) | 31(100) | | |

Chi-square test done; p<0.05 considered as statistically significant value

Table 3: Correlation of age with their inflammatorychanges (n=157)

| Dependent variable: | Cat_Age |
|----------------------------|---------|
|----------------------------|---------|

| Source | Sum of Squares | df | Mean Square | F | p-value |
|----------------------|-------------------|----|----------------|---------|---------|
| Corrected model | 0.508 | 2 | 0.254 | 0.409 | 0.665 |
| Intercept | 418.978 | 1 | 418.978 | 673.623 | 0.000 |
| Inflammatory changes | 0.508 | 2 | 0.254 | 0.409 | 0.665 |

R Squared = .005 (Adjusted R Squared = -.008)

Correlation test done; p<0.05 considered as statistically significant value

Discussion

The mean age of the study group was 36.2±11.5 years. Most women (47.1%) were in the 18-32 age groups, followed by 36.9% in the 33-49 group, and 15.9% aged 50 years or older. Cervical inflammation was significantly more common in the 18-32 age group (p < 0.005). The average parity was 3.8 ± 1.2 , with a majority (54.1%) having two or fewer births. No significant association was found between cervical inflammation and parity status (p>0.005). A study in Bangladesh found that among the 600 participants, the majority (52.67%) was in the 30-44 age groups, and 65.67% had a parity of 4 or fewer¹⁷. Another study conducted in Pakistan, the age range of 35–44 years old had the highest prevalence of positive Pap smears (50%), and 20-year-old women were the youngest to have a positive cervical smear¹⁸. The majority of the patients with positive smears (57%)were grand multiparas, with a parity of 6-8, according to the findings¹⁸. Multiparity (>3) was a significant risk factor for cervical cancer¹⁹.

Half the patients (50.3%) had mild inflammatory changes, 29.9% had moderate changes and 19.7% had severe inflammatory changes. Cervical cancer can develop at any age, from the second decade of life through to old age. The peak incidence of invasive lesions occurs at around 45 years of age, while dysplasia is most commonly seen around 30 years of age²⁰⁻²².

There was a statistically significant association between age and cervical inflammation (p<0.05). Mild, moderate, and severe inflammatory changes were most common in the 18-32 age groups, at 50.6%, 42.6%, and 45.2%, respectively. The correlation between patient age and cervical inflammatory changes was found to be significant (p<0.05). In this study, we highlighted the importance of Pap smear screening for the early detection of premalignant and malignant cervical lesions. Similar findings were reported in other studies, where the highest number of cases was observed in the young age groups^{23,24}.

Conclusion

Pap smear examination information should not only be distributed in hospitals but also widely across the community. It is still the most reliable way to identify precancerous and cancerous cervical lesions early on, young women in particular should be urged to have regular screenings. While the disease is pre-invasive, screening programs and patient education can prevent a significant number of deaths.

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