

ORIGINAL ARTICLE**Analysis of PAP Smear Examinations in 200 Cases Across Various Age Groups**

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ABSTRACT:

Background: Cervical cancer is a prevalent malignancy, particularly affecting women in developing countries. In India, the incidence of cervical cancer is alarmingly high, with one in five women being diagnosed with this condition. The burden of cervical cancer in India is among the heaviest globally. The primary aims and objectives of this study are to investigate the findings from Papanicolaou (PAP) smear examinations and to make comparisons across different age groups. This research aims to provide insights into the prevalence and characteristics of cervical abnormalities, helping to inform and improve healthcare interventions for women in various age categories. **Methods:** A study involving 200 women aged 20 years and older who had a history of amenorrhea was conducted. Slides were prepared and stained using the modified Papanicolaou staining method. The smears were carefully examined to assess various components, including epithelial cells, red blood cells, white blood cells, bacteria, trichomonas, monilial hyphae, mucus, and neoplasm. The study also involved examining the histology and cytology of the cervix, focusing on the epithelial lining, original stratified squamous epithelium, metaplastic squamous epithelium, and cervical stroma. Additionally, the presence of cervical intraepithelial neoplasia (CIN) was evaluated. **Results:** In this study, the majority of participants (80%) presented with gynecological complaints, reflecting the significant prevalence of women seeking medical attention for such issues. Out of the 200 cases examined, the results revealed a range of cervical conditions: 66 cases were reported as normal, while 112 cases were identified as having inflammatory changes. A single case was noted as metaplastic, and 6 cases were diagnosed with Cervical Intraepithelial Neoplasia (CIN) - I. There was one case classified as CIN - II, six cases as CIN - III, and a concerning six cases that tested positive for malignancy. The highest incidence of dysplasia was notably observed among women in the age group of 31-40 years. These findings underscore the importance of regular cervical screenings and early detection, especially within this age range, for timely intervention and improved outcomes. **Conclusion:** The incidence of dysplasia was found to be highest in the young working-age group. This observation highlights the importance of regular screening, especially for women in their prime years. The Pap smear test emerges as the most effective cervical cancer screening method, given its moderate cost, simplicity, and wide accessibility to patients. Regular Pap smear testing plays a critical role in early detection and effective prevention of cervical abnormalities and potential malignancies, particularly among individuals in their productive years.

Keywords: Cervical cancer, Papanicolaou test, Smear examination

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INTRODUCTION

Cervical cancer is a devastating disease, responsible for approximately one million female fatalities each year across the globe. It's a sobering statistic that highlights the urgent need for effective prevention and early detection. In recent years, cervical cancer has lost its long-held position as the leading cause of cancer-related deaths among women, with breast cancer now occupying that unfortunate spot. This shift underscores the importance of focusing on cervical cancer prevention and treatment.^{1,2}

The key to reducing the impact of cervical cancer lies in early intervention. When detected and treated in its initial stages, both the suffering experienced by patients (morbidity) and the number of lives lost (mortality) can be significantly reduced. Research has shown that timely diagnosis and appropriate treatment can result in a remarkable 70% reduction in morbidity and an impressive 80% decrease in mortality rates.

Various methods are available for diagnosing cervical malignancies, each with its own set of advantages and limitations. These methods include cytology, Schiller's iodine test, Toluidine blue test, Colposcopy, Colpo microscopy, Punch biopsy, and fluorescent microscopy. Among these options, cytology stands out as an accessible, cost-effective, accurate, and non-invasive diagnostic tool. This makes it a preferred choice for many patients due to its ease of use and reliability. In our particular healthcare setting, cytology proves to be the most valuable and practical method for cervical cancer screening and diagnosis.

The Papanicolaou test, colloquially known as the Pap smear, cervical smear, or simply the smear test, is a cornerstone of cervical cancer screening. This test was conceived by the Greek doctor Georgios Papanikolaou and is aptly named after its creator. The Pap smear has become an essential tool in the early detection of potentially precancerous and cancerous developments in the cervix. It is a testament to

medical innovation and continues to save countless lives worldwide by identifying and addressing cervical health issues in their early stages³.

This current research, involving a cohort of 200 cases, was conducted to examine cervical smears and investigate prevalent cervical pathologies within various age groups. The primary objectives of this study were to identify the most common cervical pathologies, detect early precancerous changes in the cervix, and gauge the prevalence of cervical dysplasia and cancer within the patient population at our hospital.

MATERIALS AND METHODS

The present study, spanning one year, involved an examination of 200 cases. A concise medical history was documented, encompassing details such as the patient's age, chief complaints, and medical background. The study specifically focused on females aged 20 years and above who presented with various concerns, including issues such as vaginal bleeding (per vaginum or P/V), leucorrhoea, vulva itching, sterility, and more. Additionally, females without any specific complaints were also included in the study. Moreover, individuals with a history of amenorrhea were incorporated into the research cohort.

To ensure the integrity of the study, certain criteria were established for the selection and exclusion of patients. Those with a history of recent vaginal surgeries, the use of vaginal douches, chemical contraceptives or antibiotics, especially during or immediately following menstruation or after dilatation and curettage, were excluded from participation.

The study's methodology involved the careful preparation of glass slides, each marked with the patient's unique identifier to prevent any mix-up or confusion. Patients were advised to empty their bladders before undergoing a per speculum examination, during which they assumed the lithotomy position. An Ayre's spatula, with its longer end, was inserted through the external os and extended deep into the cervical canal. The spatula was

then rotated a full 360 degrees to ensure comprehensive scraping of the squamocolumnar junction, securing a high-quality endo-cervical specimen for analysis. The meticulous collection of cervical specimens involved reaching the squamocolumnar junction to secure a high-quality endo-cervical component. This material was then evenly spread onto a clean glass slide in an anti-clockwise motion and immediately submerged in a Coplin jar filled with fixative. To ensure proper fixation, a minimum of 15 minutes was necessary. Subsequently, the slides were allowed to air dry and later subjected to staining using the modified Papanicolaou staining method.

The stained smear was meticulously examined for the presence of various components, with epithelial cells appearing dark blue, red blood cells displaying a vibrant red hue, white blood cells presenting as pale blue with dark blue-black nuclei, bacteria stained in grey, trichomonas appearing as faint greyish blue, monilia hyphae appearing pink while the spores stained brilliant red, mucus displaying a pale blue or pinkish shade, and the presence of any neoplastic changes⁴.

The cervical cytology examination encompassed the observation of the epithelial lining, the original stratified squamous epithelium, metaplastic squamous epithelium, and the cervical stroma. Moreover, the examination included the assessment of cervical intraepithelial neoplasia (CIN), which was categorized into CIN-I (mild dysplasia), CIN-II (moderate dysplasia), and CIN-III (severe dysplasia and carcinoma in situ). The study also involved the evaluation of invasive carcinoma of the cervix to comprehensively assess the cervical health status of the patients.

RESULTS

Among the 200 women who underwent screening, 80% were identified as having gynecological complaints, while the remaining 20% presented with non-gynecological concerns.

Table1: The cytological pattern seen in different age groups

Age groups (year)	Total	Normal	Inflammation	Metaplasia	Dysplasia			Invasive carcinoma
					CIN-I	CIN-II	CIN-III	
20-30	60	16	40	2	0	0	0	2
31-40	60	20	32	0	2	2	4	0
41-50	40	18	16	0	2	0	0	4
>50	40	12	24	0	2	0	2	0
Total	200	66	112	2	6	2	6	6

Out of the 200 cases examined, the results were as follows:

- 66 cases were reported as normal.
- 112 cases were found to have inflammatory findings.
- One case was diagnosed as metaplastic.
- 6 cases were identified as CIN-I (mild dysplasia).

- 2 cases were diagnosed as CIN-II (moderate dysplasia).
- 6 cases were confirmed as CIN-III (severe dysplasia and carcinoma in situ).
- 6 cases tested positive for malignancy.

It's noteworthy that the highest incidence of dysplasia was observed in the age group between 31 and 40

years, indicating that this age range had a higher prevalence of cervical abnormalities⁵. Among the cases, the youngest patient diagnosed with malignancy was just 22 years old, while the oldest

patient with malignancy was 45 years old. These findings provide valuable insights into the distribution of cervical pathologies across different age groups and the prevalence of dysplastic and malignant conditions.

Table 2: Showing Smear classification

Smears		No of cases
Normal		66
Inflammatory	Bacterial	4
	Fungal	2
	Parasitic	6
	Nonspecific	100
Metaplastic		2
CIN-I		6
CIN-II		2
CIN-III		6
Invasive carcinoma		6
Total		200

DISCUSSION

Cervical screening is a pivotal component of women's healthcare, serving as a primary method for early detection of precancerous lesions in the cervix. Timely identification of these abnormalities allows for prompt medical interventions, which can effectively halt the progression of these lesions into full-blown cervical cancer. The significance of regular cervical screening cannot be overstated, as it substantially enhances a patient's chances of survival by addressing potential issues at their earliest, most manageable stages.

In the context of a study involving 200 cases, the results of Pap smears revealed a diverse spectrum of cervical conditions. Among these cases, 66 were reported as normal, indicating a healthy cervix. However, a substantial portion of the cases, comprising 112 patients, presented with inflammatory findings⁶. Furthermore, one case was categorized as metaplastic, suggesting changes in the cervical tissue. These findings are consistent with the trends observed in prior studies within the field, reinforcing the importance of this research.

For example, a study led by Sunita et al reported that a considerable 71.96% of their findings exhibited inflammatory conditions, underlining the prevalence of such cervical issues. In the same study, a small fraction, accounting for 0.5%, was diagnosed with squamous cell carcinoma, emphasizing the critical role of early detection in preventing severe conditions. Similarly, research conducted by Mandakini et al^[5] yielded results that parallel the current study's findings. In their study, they observed that a substantial 57.5% of Pap smear reports were classified as inflammatory, while another 0.7% were attributed to squamous cell carcinoma.

Within the 200 cases of the present study, distinct abnormalities were identified, with six cases of CIN-I (mild dysplasia), two cases of CIN-II (moderate dysplasia), six cases of CIN-III (severe dysplasia and carcinoma in situ), and three cases that tested positive

for malignancy. These results align with the findings of Poste et al., who investigated 1270 cervical specimens. Their research reported that 13% of these specimens showed malignant conditions. Within the spectrum of cervical intraepithelial lesions, comprising 4.04% of cases, 29.4% were classified as CIN I, 49.01% as CIN II, and 25.49% as CIN III, illustrating the progression of cervical abnormalities.

Furthermore, the present study illuminated that the highest incidence of dysplasia was observed in the age group of 31 to 40 years, shedding light on the demographic characteristics of these cervical conditions. Notably, the youngest patient diagnosed with malignancy was just 22 years old, underscoring the importance of cervical screening from an early age. In contrast, the oldest patient diagnosed with malignancy was 45 years old, highlighting the necessity of continued monitoring and early intervention throughout a woman's life⁷.

These findings are consistent with research by Sunita et al., who noted that a substantial percentage of women within their study fell within the 31 to 40-year age bracket (32.68%). In contrast, another study conducted by Mandakini et al. focused on women between the ages of 15 and 30.

Additionally, research conducted by Khalaf et al.⁸ delved into the connection between early marriage and socio-medical characteristics with cervical Pap smear results. Their study uncovered a significant association between early marriage, defined as marriage at or before the age of 18, and the presence of abnormal Pap smear results. This underscores the multifaceted factors, including socio-medical variables, that can influence cervical health outcomes and the need for a holistic approach to women's healthcare.

CONCLUSION

Cervical carcinoma stands as a grave health concern, particularly in underdeveloped nations, where it ranks as the most prevalent cancer among women. The

impact of this disease is profound, as it not only brings about severe illness but also leads to a significant loss of life. In this context, the Pap smear test emerges as a crucial tool in the fight against cervical cancer. Its effectiveness lies in its affordability, simplicity, and widespread accessibility. These attributes make it a valuable resource, particularly in resource-constrained areas. In rural regions characterized by low socioeconomic status, the widespread implementation of Pap smears is of paramount importance. While the Pap smear is undeniably a powerful screening tool for cervical cancer, its preventive potential hinges on regular and systematic screening. Serial screening, where women are tested at regular intervals, is the cornerstone of effective prevention. By ensuring that women, especially in underserved areas, receive routine and consistent Pap tests, we can significantly reduce the incidence of cervical carcinoma and ultimately save lives.

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