

CERVICAL SCREENING USING PAP SMEAR IN FIRST TRIMESTER OF PREGNANCY

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ABSTRACT

Cervical cancer is a leading cause of cancer-related mortality among women, particularly in low- and middle-income countries. Early detection through screening plays a critical role in reducing morbidity and mortality. Pregnancy presents an opportunity for cervical cancer screening, as women attend antenatal visits regularly. This study aims to screen antenatal women in their first trimester using Pap smears to identify pre-malignant and malignant cervical lesions.

The study was conducted at Gandhi Medical College, Bhopal, and included 400 pregnant women in their first trimester. Results showed that 43% had inflammatory smears, while 4.25% had infectious smears. No cases of high-grade squamous intraepithelial lesions (HSIL) or malignancies were detected. The study emphasizes the importance of integrating cervical cancer screening into routine antenatal care.

Keywords:

HSIL - High-grade squamous intraepithelial lesion

PAP - Papanicolaou

HPV - Human Papilloma virus

CIN - Cervical intraepithelial neoplasia

NILM - Negative for intraepithelial lesion or malignancy

INTRODUCTION

Cervical cancer is the fourth most common cancer among women globally, with a particularly high burden in low-income countries due to a lack of screening programs¹. Human Papilloma virus (HPV) infection is the primary etiological factor, with high-risk strains such as HPV-16 and HPV-18 being responsible for most cervical malignancies². The disease progresses from cervical intraepithelial neoplasia (CIN) to invasive carcinoma over 10–20 years, making it amenable to early detection through screening³.

The Papanicolaou (Pap) smear is a widely used, cost-effective, and simple screening tool that helps detect pre-malignant and malignant lesions. It has been shown to significantly reduce cervical cancer-related mortality. Pregnancy is an ideal time to screen for cervical cancer, as women regularly seek medical care during antenatal visits⁴.

This study aims to determine the prevalence of cervical abnormalities among pregnant women in their first trimester and assess the feasibility of integrating cervical cancer screening into antenatal care.

METHODS

Study Design and Setting

This observational study was conducted at the Department of Obstetrics and Gynaecology, Gandhi Medical College, Bhopal, over 18 months. Ethical clearance was obtained from the Institutional Ethical Committee, and informed consent was obtained from all participants.

Study Population

The study included 400 pregnant women in their first trimester (<12 weeks gestation) who attended antenatal clinics.

Inclusion Criteria

Pregnant women in their first trimester (<12 weeks gestation).

Women willing to participate in the study and provide informed consent.

Exclusion Criteria

Pregnancies beyond 12 weeks gestation.

History of sexual intercourse or vaginal medication use within 48 hours.

Presence or history of vaginal bleeding during pregnancy.

Previous Pap smear in the last three years with a normal report.

Data Collection

A detailed history was taken, including age, education, socioeconomic status, obstetric history, and risk factors for cervical cancer (e.g., early age at marriage, multiple sexual partners, smoking, alcohol use, history of sexually transmitted infections). A general physical and obstetric examination was performed, followed by a per-speculum examination to assess the cervix for abnormalities such as erosions, hypertrophy, or abnormal discharge.

Pap Smear Collection and Processing

Pap smears were collected using an Ayre's spatula and cytobrush. The samples were spread onto glass slides, fixed in 95% ethanol, and analyzed in the pathology laboratory using the Bethesda system for cytological classification. Results were categorized as:

Negative for intraepithelial lesion or malignancy (NILM)

Inflammatory smears

Infections (Bacterial vaginosis, Trichomonasvaginalis, Candida)

Atypical squamous cells of undetermined significance (ASC-US)

Low-grade squamous intraepithelial lesion (LSIL)

High-grade squamous intraepithelial lesion (HSIL)

Malignancy

STATISTICAL ANALYSIS

Data were analyzed using SPSS software version 23. Descriptive statistics were used to summarize demographic and clinical characteristics. The chi-square test was applied to assess associations between categorical variables, with significance set at $p < 0.05$.

RESULTS

Demographic Characteristics

The mean age of participants was 23.06 ± 2.72 years, with 55% in the 22-25 age group, 29% in the 18-21 age group, and only 2% aged ≥ 30 years.

Education Level: 43% had primary or middle school education, while only 9.25% were graduates or postgraduates.

Socioeconomic Status: 74.5% belonged to the upper-lower class, 21% to the lower class, and only 1.5% to the upper-middle class.

Obstetric History: 52% were primigravida, while 48% were multigravida.

Age at First Sexual Intercourse: 64.75% had their first sexual encounter before 20 years of age.

PAP SMEAR FINDINGS

Normal Smear (NILM): 50.75% (203 cases).

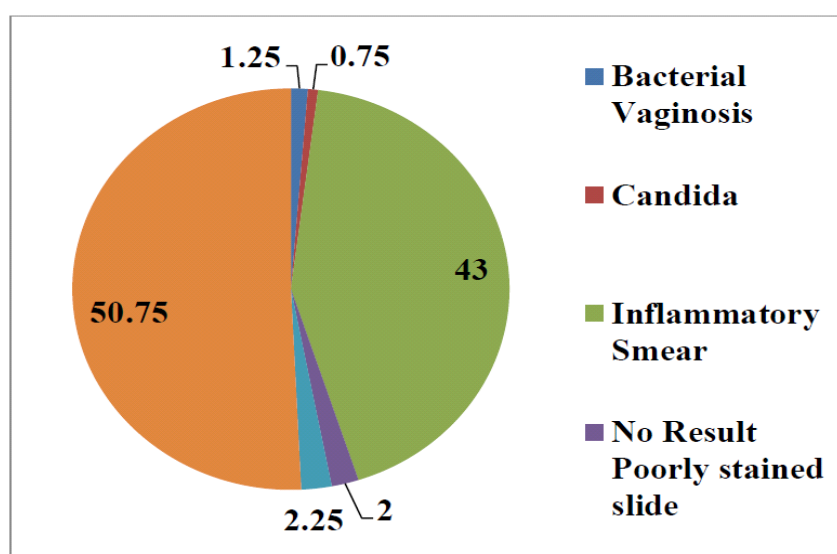
Inflammatory Smear: 43% (172 cases).

Infections: 4.25% (17 cases) - Trichomonasvaginalis (2.25%), Bacterial vaginosis (1.25%), Candida (0.75%).

Poorly Preserved Slides: 2% (8 cases).

No cases of ASC-US, LSIL, HSIL, or malignancy were detected.

Fig 14: Result

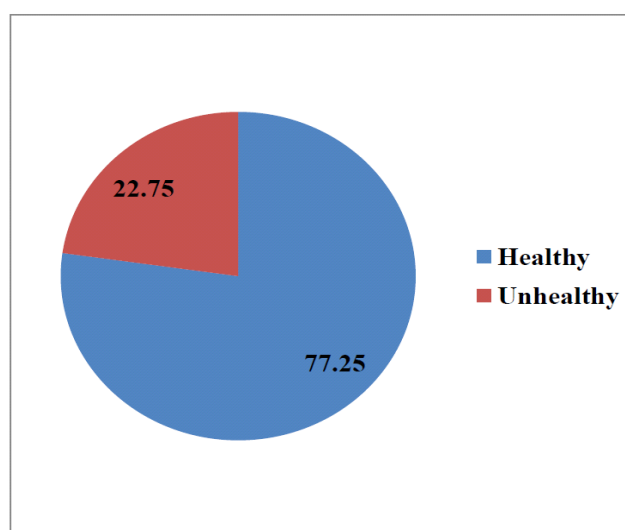


Per-Speculum Examination Findings

Healthy cervix: 77.25% (309 cases).

Unhealthy cervix (discharge, erosion, hypertrophy): 22.75% (91 cases).

Fig 13: Distribution of the cases based on Per Speculum examination



A statistically significant association was found between per-speculum examination findings and Pap smear results ($p < 0.00001$), with most inflammatory and infectious smears correlating with an unhealthy cervix on examination.

DISCUSSION

The prevalence of inflammatory smears in this study (43%) is comparable to previous studies conducted in India and other low-resource settings. Inflammatory changes in pregnancy are often physiological but warrant follow-up to rule out persistent infections that could increase the risk of preterm birth and other complications.

A significant proportion of women (4.25%) had infections, including *Trichomonas vaginalis*, Bacterial vaginosis, and *Candida*. Previous studies have demonstrated that untreated infections during pregnancy are associated with adverse

outcomes such as preterm labor and low birth weight. Early identification and treatment of these infections can improve pregnancy outcomes.

The complete absence of ASC-US, LSIL, HSIL, or malignant lesions in this study suggests a low prevalence of pre-cancerous and cancerous cervical lesions in this population. However, the lack of HPV vaccination (0% coverage in our study) highlights the need for improved awareness and preventive measures. Studies have shown that integrating HPV vaccination and routine Pap smear screening can significantly reduce cervical cancer incidence.

Awareness regarding cervical cancer screening was notably low, with only 3.75% of women (graduates and postgraduates) having any knowledge about the Pap smear test. This finding underscores the importance of health education and community-based awareness programs to improve screening uptake.

CONCLUSION

This study demonstrates the feasibility and importance of integrating Pap smear screening into antenatal care. A significant proportion of women had inflammatory and infectious smears, reinforcing the need for routine cervical screening during pregnancy. Given the low awareness about cervical cancer screening, educational initiatives should be implemented to encourage women to undergo regular screening. Additionally, introducing HPV vaccination programs can further reduce cervical cancer incidence in the long term.

Recommendations

1. Implement routine Pap smear screening in antenatal clinics.
2. Increase awareness about cervical cancer screening among women.
3. Strengthen HPV vaccination programs for adolescent girls.
4. Conduct further research with a larger sample size to assess the prevalence of pre-cancerous lesions.

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