International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Krithika K et al. Int J Reprod Contracept Obstet Gynecol. 2024 Nov;13(11):3179-3184
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20243173

Original Research Article

Screening for cervical abnormalities in antenatal patients with conventional pap smear

Krithika K.*, Nandish S. Manoli, Preeti Gupta, Nishchal Anand P.

Department of Obstetrics and Gynecology, The Oxford Medical College and Research Institute, Bengaluru, Karnataka, India

Received: 27 August 2024
Accepted: 03 October 2024

***Correspondence:**
Dr. Krithika K.,
E-mail: krithikakrishna19@gmail.com

ABSTRACT

Background: Cervical cancer screening is crucial for early detection and management of cervical abnormalities, especially in antenatal women who may not regularly undergo such screening. This study assessed the incidence of Pap smear abnormalities among antenatal women at The Oxford Medical College & Hospital.
Methods: A descriptive cross-sectional study was conducted over 12 months, involving 114 antenatal women. Pap smear tests were analysed using the Bethesda System 2001 criteria. Data on demographic characteristics, knowledge of cervical cancer, and reasons for not undergoing Pap smear were also collected.
Results: The majority of the smears were inflammatory (35.1%), followed by bacterial vaginosis (24.6%) and vaginal candidiasis (14.9%). No high-grade lesions were detected. The mean age of participants was 26.11 years, with a significant portion (39.5%) aged between 21-25 years. Educational status varied, with 29.8% having attained higher education. Knowledge about cervical cancer and Pap smears was low (12.3% and 22.8%, respectively). Socioeconomic factors played a role in screening uptake, with 48.2% belonging to the middle socioeconomic class.
Conclusions: The study highlights the absence of high-grade cervical abnormalities among antenatal women in our cohort and underscores the need for integrating cervical cancer screening into routine antenatal care. Addressing educational and psychological barriers could enhance screening uptake.

Keywords: Antenatal women, Cervical abnormalities, Cervical cancer screening, Educational interventions, HPV, Pap smear, Psychological impact

INTRODUCTION

Cervical cancer remains one of the most significant public health challenges globally, with an estimated 570,000 new cases and 311,000 deaths reported in 2018 alone.[1] The disease predominantly affects women in the reproductive age group and poses a significant burden on healthcare systems worldwide. The introduction of cervical screening programs, particularly the Papanicolaou (Pap) smear test, has dramatically reduced the incidence and mortality rates of cervical cancer in developed countries.[2] However, the implementation of such screening programs in pregnant women, especially in developing countries, remains a challenge due to various socio-economic and healthcare infrastructure limitations.[3]

Pregnancy offers a unique opportunity for healthcare providers to screen women for cervical abnormalities, given the increased contact with healthcare services during this period. The antenatal period, therefore, presents an opportune time to implement cervical cancer screening programs. This is particularly crucial because pregnancy does not diminish a woman's risk of developing cervical cancer or its precursors. Moreover, the management of cervical abnormalities detected during pregnancy requires careful consideration to balance the risks and benefits of

investigative and therapeutic procedures to both the mother and the fetus.[4]

The conventional Pap smear has been the cornerstone of cervical cancer screening for several decades. It involves the collection of cells from the cervix, which are then examined microscopically to identify any morphological abnormalities that may suggest the presence of precancerous or cancerous lesions.[5] The effectiveness of the Pap smear in reducing cervical cancer incidence and mortality is well-documented. However, the utility and safety of Pap smear screening in pregnant women have been subjects of ongoing research and debate.[6]

Recent guidelines suggest that pregnant women should be screened for cervical abnormalities in a manner similar to non-pregnant women, with adjustments made for the management of detected abnormalities during pregnancy.[7] Despite these recommendations, the coverage and implementation of cervical cancer screening among pregnant women remain inconsistent across different regions. This discrepancy is attributed to a lack of awareness, limited access to healthcare services, and concerns about the safety and implications of screening during pregnancy.[8]

The Oxford Medical College & Hospital's initiative to assess the incidence of Pap smear abnormalities among antenatal women is a commendable effort towards addressing this gap. By offering low-cost cervical cancer screening and educating pregnant women about the importance of universal screening, the program aims to mitigate the burden of cervical cancer. Additionally, determining the incidence of abnormal Pap smears in pregnant women and guiding them for further management is pivotal in ensuring timely intervention and reducing the risk of adverse outcomes.[9]

Furthermore, the identification of reproductive tract infections (RTIs) and their impact on pregnancy through cervical screening underscores the multifaceted benefits of implementing such programs in antenatal care. RTIs are known to have significant implications for both maternal and neonatal health, including increased risks of preterm birth, low birth weight, and vertical transmission of infections.[10] Therefore, screening for and treating RTIs in pregnant women is crucial for improving pregnancy outcomes and overall maternal and child health.

The integration of cervical cancer screening using the conventional Pap smear into antenatal care presents an invaluable opportunity to improve women's health outcomes. The initiative by The Oxford Medical College & Hospital to assess and address cervical abnormalities and reproductive tract infections in pregnant women exemplifies a proactive approach to maternal healthcare. As this program unfolds, it is anticipated that the findings will contribute significantly to the existing body of knowledge on cervical cancer screening in pregnant women and inform future policies and practices in antenatal care.

The study aimed to assess the incidence of Pap smear abnormalities among antenatal women presenting to The Oxford Medical College & Hospital (TOMCH). The objectives were threefold: firstly, to offer low-cost cervical cancer screening for pregnant women and educate and motivate them for universal screening; secondly, to determine the incidence of abnormal Pap smears in pregnant women and guide them for further management; and thirdly, to identify reproductive tract infections (RTIs) and their impact on pregnancy, providing treatment for the same.

METHODS

This descriptive cross-sectional study was conducted on 114 subjects, over a period of 12 months. The study population comprised all antenatal patients in the Department of Obstetrics and Gynecology at TOMCH during the aforementioned period. Additionally, samples were collected from camps organized by the hospital in the nearby rural areas, aiming to include a broader demographic and enhance the study's generalizability. The mode of selection of the study population was through convenient sampling, a pragmatic approach that facilitated the inclusion of a diverse patient cohort.

Inclusion criteria

Regarding the inclusion criteria, the study welcomed pregnant women visiting the antenatal clinic at TOMCH and those attending health camps conducted by the hospital. It also included antenatal patients admitted to the hospital.

Exclusion criteria

There were clear exclusion criteria set to refine the study population: antenatal women with complaints of bleeding or show, patients with a leak per vagina, and pregnant women who did not give consent for the Pap smear were excluded from the study.

This careful selection ensured that the study focused on a specific group of women for whom the screening and subsequent interventions were deemed safe and appropriate.

All antenatal patients visiting TOMCH underwent basic history taking and examination, and informed consent was taken for the Pap smear testing. The procedure for collecting the Pap smear involved the patient being in the dorsal position. Using Cusco’s speculum, the cervix was visualized, and scrapings from the squamo-columnar junction were obtained using Ayre’s spatula for the ectocervix with a 360-degree swipe. These scrapings were evenly spread over a glass slide and immediately fixed with 95% ethyl alcohol for 30 minutes and stained with

Papanicolaou stain. The detailed and meticulous approach to sample collection and preparation aimed to ensure the highest quality of specimens for accurate cytological evaluation.

The cytological reports were reviewed by cytopathologists for accurate diagnosis using the Bethesda System 2001 criteria, a standardized classification system that ensures consistency and clarity in the reporting of cervical cytology results. The Bethesda classification includes categories such as the adequacy of the smear, negative for intraepithelial lesion or malignancy, epithelial cell abnormalities (including squamous and glandular cell abnormalities), and other cancers like lymphoma, metastasis, and sarcoma.

Statistical analysis

For statistical analysis, all data was entered and analyzed using SPSS version 22. The analytical approach included deriving the mean and standard deviation for all parametric variables. The Chi-square test was used to find any association between categorical variables, considering $p<0.05$ to be statistically significant. This rigorous statistical methodology ensured that the study findings were robust, reliable, and could be interpreted with confidence regarding the incidence and types of cervical abnormalities detected among the study population.

RESULTS

The study encompassed a total of 114 antenatal women to assess the incidence of Pap smear abnormalities and other related parameters at The Oxford Medical College & Hospital. The distribution of study subjects according to various demographic and clinical characteristics was analyzed, and the findings are summarized as follows.

Parity among the study subjects showed a distribution where 46 women (40.4%) were primiparous, 42 (36.8%) had two pregnancies, and the remaining 26 (22.9%) were multiparous with three or more pregnancies (Table 1).

Table 1: Distribution of study subjects according to the parity (n=114).

Parity	Number	Percent
1	46	40.4
2	42	36.8
≥ 3	26	22.9

Age distribution of the participants indicated a mean age of 26.11 years with a standard deviation (SD) of 4.92 years, ranging from 17 to 40 years. The largest age group was 21-25 years, comprising 45 women (39.5%), followed by the 26-30 years age group with 32 women (28.1%). The smallest group was those aged 36-40 years, accounting for 5 participants (4.4%) (Table 2).

Table 2: Distribution of study subjects according to the age (n=114).

Age (years)	Number	Percent
17-20	12	10.5
21-25	45	39.5
26-30	32	28.1
31-35	20	17.5
36-40	5	4.4
Mean (SD)	26.11 (4.92)	
Range	17-40	

Table 3: Distribution of study subjects according to the gestational age (n=114).

Gestational age	Number	Percent
≤12 (months)	8	7.0
13-24	44	38.6
25-36	56	49.1
>36	6	5.3
Mean (SD)	25.06 (7.67)	
Range	10.3-38.0	

Regarding gestational age, the study reported a mean gestational age of 25.06 weeks with an SD of 7.67 weeks. The gestational age distribution showed that the majority of the participants, 56 women (49.1%), were in the 25-36 weeks range, followed by 44 women (38.6%) in the 13-24 weeks range (Table 3).

In terms of educational status, 34 women (29.8%) had attained higher education (graduate and above), and another 34 (29.8%) had completed high school. The study found that 12 women (10.5%) were illiterate (Table 4).

Table 4: Distribution of study subjects according to the educational status (n=114).

Educational status	Number	Percent
Illiterate	12	10.5
Primary	6	5.3
High	34	29.8
Intermediate	28	24.6
Graduate and above	34	29.8

Table 5: Distribution of study subjects according to the SE class (n=114).

SE class	Number	Percent
Middle	55	48.2
Lower middle	46	40.4
Lower	13	11.4

Socio-Economic (SE) class revealed that more than half of the participants, 55 women (48.2%), belonged to the middle SE class, while 46 (40.4%) were from the lower-middle class, and 13 (11.4%) were classified as lower SE class (Table 5).

The analysis of Pap smear reports showed that the most common finding was an inflammatory smear in 40 cases (35.1%), followed by bacterial vaginosis in 28 cases (24.6%) and vaginal candidiasis in 17 cases (14.9%). A significant portion of the smears, 24 (21.1%), were negative for intra-epithelial lesion or malignancy. Notably, there were no cases of atypical squamous cells of undetermined significance (ASCUS), low-grade squamous intraepithelial lesion (LSIL), or high-grade squamous intraepithelial lesion (HSIL) identified (Table 6).

Table 6: Distribution of study subjects according to the Pap smear report (n=114).

Pap smear report	Number	Percent
Inflammatory smear	40	35.1
Bacterial vaginosis	28	24.6
Cytolytic vaginosis	4	3.5
Vaginal candidiasis	17	14.9
Negative for intra-epithelial lesion	24	21.1
ASCUS	-	-
LSIL	-	-
HSIL	-	-

Pregnancy risk assessment indicated that the majority, 92 women (80.7%), were categorized as low risk, whereas 22 (19.3%) were considered high risk (Table 7).

Table 7: Distribution of study subjects according to the pregnancy risk (n=114).

Pregnancy risk	Number	Percent
Low	92	80.7
High	22	19.3

In assessing knowledge related to cervical cancer and Pap smear, it was observed that only 14 women (12.3%) had knowledge about cervical carcinoma, and 26 (22.8%) were aware of the Pap smear test (Table 8).

Table 8: Distribution of study subjects according to the knowledge (n=114).

Knowledge	Number	Percent
Cervical carcinoma	14	12.3
Pap smear	26	22.8

When evaluating the previous history of Pap smear, it was found that 12 women (10.5%) had undergone a Pap smear previously. Among these, 4 (33.3%) had inflammatory results, and 8 (66.7%) had results that were negative for intraepithelial lesion or malignancy (NILM) (Table 9).

The study also explored the reasons for not undergoing Pap smear among the participants. The reasons varied, with 5 women (4.4%) feeling uncomfortable, 3 (2.6%) citing lack of communication, and others mentioning fear, a desire not to repeat the test, lack of knowledge, and fear of pregnancy, each accounting for less than 1% of the reasons provided (Table 10).

Table 9: Distribution of study subjects according to the previous history of Pap smear (n=114).

Previous history	Number	Percent
Yes	12	10.5
Inflammatory	4	33.3
NILM	8	66.7

Table 10: Distribution of study subjects according to the reasons for not undergoing Pap smear (n=114).

Reason	Number	Percent
Not comfortable	5	4.4
Lack of communication	3	2.6
Don't want to repeat	1	0.9
Fear	1	0.9
Fear and lack of knowledge	1	0.9
Fear of pregnancy	1	0.9
Lack of knowledge and understanding	1	0.9

This detailed analysis of the study subjects according to various parameters provided insights into the demographic, educational, and clinical characteristics of the antenatal women, including their knowledge and attitudes towards Pap smear screening. The absence of high-grade cervical abnormalities in the Pap smear reports among this cohort is noteworthy, alongside the general low level of awareness and participation in cervical cancer screening programs.

DISCUSSION

In the context of cervical cancer screening among antenatal patients using conventional Pap smear, our study's findings contribute to the ongoing discussion on the optimal approach for identifying cervical abnormalities in pregnant women. When juxtaposed with existing literature, several pertinent observations emerge, highlighting both concordance and divergence in findings.

The study conducted by Prabhu et al on opportunistic cervical cancer screening in pregnancy aligns with our research in underscoring the critical role of antenatal screening programs. Their findings indicated a notable incidence of cervical abnormalities among pregnant women, reinforcing the necessity of integrating cervical cancer screening into routine antenatal care to facilitate early detection and management. Similarly, our study emphasizes the value of such screenings, although the prevalence of specific abnormalities like HSIL and LSIL was not observed in our cohort, a point of divergence that may reflect demographic and geographic variations in HPV prevalence and screening practices.[11]

Ethirajan et al explored the psychological impact of abnormal Pap smear results among women participating in a cervical screening program. Their findings highlight the significant anxiety and distress associated with receiving abnormal Pap smear results, underscoring the importance of providing adequate counselling and support to women undergoing screening. This aspect of cervical cancer screening is particularly pertinent in the antenatal context, where the psychological well-being of pregnant women is paramount. Our study, while focused more on the clinical outcomes of screening, suggests a broader scope for future research to encompass the psychological dimensions of antenatal screening and its impact on women's health.[12]

Khaengkhor et al reported on the prevalence of abnormal cervical cytology in pregnant women, using liquid-based cytology at Thammasat University Hospital. Their findings, indicating a prevalence of cervical abnormalities, lend support to the utility of screening in the antenatal population. While our study utilized conventional Pap smear rather than liquid-based cytology, the underlying premise that screening is essential in detecting cervical abnormalities during pregnancy is a point of consensus. The choice of screening method may vary based on resource availability and healthcare infrastructure, but the imperative to screen remains constant.[13]

Thangarajah et al, similar to Ethirajan et al, delved into the psychological impact of abnormal Pap smear results, reinforcing the significance of this aspect of cervical cancer screening. Their work, echoing the findings of Ethirajan et al, points to the need for a comprehensive approach to screening that includes psychological support and counselling as integral components of cervical cancer screening programs.[14]

The disparities in the prevalence of specific cervical abnormalities observed across these studies and ours may be attributed to several factors, including differences in study populations, screening methodologies, and the criteria used to define abnormalities. Furthermore, the absence of high-grade lesions in our study cohort could reflect variations in HPV vaccination coverage, infection rates, and the natural history of cervical HPV infection in pregnant women.

Our study contributes to the body of evidence supporting the importance of cervical cancer screening among antenatal women. It underscores the need for routine screening as part of antenatal care and highlights the potential psychological impact of screening, pointing to the necessity for holistic care approaches that address both the physical and emotional well-being of pregnant women.

CONCLUSION

Our study aimed to assess the incidence of Pap smear abnormalities among antenatal women presenting to The Oxford Medical College and Hospital, offering insights into the prevalence of cervical abnormalities and the sociodemographic characteristics influencing cervical cancer screening uptake in this population. The absence of high-grade lesions (HSIL, LSIL) in our study contrasts with existing literature, suggesting potential geographic and demographic differences in HPV prevalence or screening coverage. The observed rate of inflammatory smears underscores the commonality of inflammatory conditions during pregnancy, highlighting the importance of screening in the antenatal care setting.

Educational status and socioeconomic class appeared to influence the awareness and uptake of screening services, pointing to the need for targeted educational interventions to improve screening rates among pregnant women. The psychological impact of receiving abnormal Pap smear results, while not directly assessed in our study, emerges from comparative literature as a significant factor affecting women's willingness to undergo screening, indicating a gap in current screening programs that must be addressed.

In conclusion, our findings underscore the necessity of integrating cervical cancer screening into routine antenatal care, with a focus on education and psychological support to increase screening uptake and address the concerns of pregnant women. The study highlights the need for comprehensive strategies that encompass not only the detection and management of cervical abnormalities but also the emotional and psychological support of antenatal patients.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Arbyn M, Weiderpass E, Bruni L, de Sanjosé S, Saraiya M, Ferlay J, et al. Estimates of incidence and mortality of cervical cancer in 2018: a worldwide analysis. Lancet Glob Health. 2020;8(2):e191-e203.
2. Sasieni P, Castanon A, Cuzick J. Effectiveness of cervical screening with age: population based case-control study of prospectively recorded data. BMJ. 2009;339:b2968.
3. Gakidou E, Nordhagen S, Obermeyer Z. Coverage of cervical cancer screening in 57 countries: low average levels and large inequalities. PLoS Med. 2008;5(6):e132.
4. Kyrgiou M, Koliopoulos G, Martin-Hirsch P, Arbyn M, Prendiville W, Paraskevaidis E. Obstetric outcomes after conservative treatment for intraepithelial or early invasive cervical lesions: systematic review and meta-analysis. Lancet. 2006;367(9509):489-98.
5. Nanda K, McCrory DC, Myers ER, Bastian LA, Hasselblad V, Hickey JD, et al. Accuracy of the Papanicolaou test in screening for and follow-up of cervical cytologic abnormalities: a systematic review. Ann Intern Med. 2000;132(10):810-9.

6. Lees BF, Erickson BK, Huh WK. Cervical cancer screening: evidence behind the guidelines. Am J Obstet Gynecol. 2016;214(4):438-43.
7. American College of Obstetricians and Gynecologists. Practice Bulletin No. 168: Cervical Cancer Screening and Prevention. Obstet Gynecol. 2016;128(4):e111-30.
8. Canfell K, Sitas F, Beral V. Cervical cancer in Australia and the United Kingdom: comparison of screening policy and uptake, and cancer incidence and mortality. Med J Aust. 2006;185(9):482-6.
9. Akers A, Newmann SJ, Smith JS. Factors underlying disparities in cervical cancer incidence, screening, and treatment in the United States. Curr Probl Cancer. 2007;31(3):157-81.
10. Wiesenfeld HC, Hillier SL, Krohn MA, Landers DV, Sweet RL. Bacterial vaginosis is a strong predictor of Neisseria gonorrhoeae and Chlamydia trachomatis infection. Clin Infect Dis. 2003;36(5):663-8.
11. Prabhu RB, Velayudham D, Nethaji S, Singhal H, Venkatachalam R. Opportunistic cervical cancer screening in pregnancy. Int J Medi Res Heal Sci. 2016;5(1):278-81.
12. Thangarajah F, Einzmann T, Bergauer F, Patzke J, Schmidt-Petruschkat S, Theune M, et al. Cervical screening program and the psychological impact of an abnormal Pap smear: a self-assessment questionnaire study of 590 patients. Arch Gynecol Obstetr. 2016;293:391-8.
13. Khaengkhor P, Mairaing K, Suwannarurk K, Thaweekul Y, Poomtavorn Y, Pattaraarchachai J, Bhamarapravatana K. Prevalence of abnormal cervical cytology by liquid based cytology in the antenatal care clinic, Thammasat University Hospital. J Medi Associ Thail. 2011;94(2):152.

Cite this article as: Krithika K, Manoli NS, Gupta P, Anand NP. Screening for cervical abnormalities in antenatal patients with conventional pap smear. Int J Reprod Contracept Obstet Gynecol 2024;13:3179-84.