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ORIGINAL RESEARCH

Efficacy of PAP smear among pregnant women attending antenatal clinic

Ujwala P[1], Shrutika[2], Radhika[3]

[1]Senior Resident, Department of Obstetrics and Gynaecology, ESIC Medical College and Hospital, Gulbarga, India
[2,3]Assistant Professor, Department of Obstetrics and Gynaecology, ESIC Medical College and Hospital Kalaburagi, India

Corresponding Author
Radhika
Assistant Professor, Department of Obstetrics and Gynaecology, ESIC Medical College and Hospital Kalaburagi, India

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Abstract

Introduction: Pregnancy causes various hormonal changes and also changes in the anatomy of a Woman cervix. **Objective:** The main objective of the study is to find the efficacy of PAP smear among pregnant women attending antenatal clinic. **Methodology of the study:** This prospective observational study was conducted at ESIC hospital,Gulbarga from November 2023 to April 2024. Data were collected from 100 pregnant females. Data collection was carried out by trained healthcare professionals under the supervision of a gynecologist. Eligible participants were identified during their routine antenatal visits. The participants were first briefed on the goals of the research and written consent was sought from them. Cervical cells were collected from each participant through a cytobrush and a PAP smear was done. **Results:** Data were collected from 100 women, the majority (75%) were between 18 and 30 years old, with 40% aged 18-25 years and 35% aged 26-30 years. Half of the participants were primigravida, while the other half were multigravida. In terms of pregnancy stage, 50% of the women were in their second trimester, 30% in the third trimester, and 20% in the first trimester, reflecting a diverse representation across different stages of pregnancy.10% of the women had atypical squamous cells of undetermined significance (ASCUS), while 6% were diagnosed with low-grade squamous intraepithelial lesions (LSIL). More concerning findings included 3% of women with high-grade squamous intraepithelial lesions (HSIL) and 1% diagnosed with squamous cell carcinoma, highlighting the importance of regular cervical screening during pregnancy. **Conclusion:** It is concluded that PAP smear screening is an essential component of antenatal care, effectively detecting cervical abnormalities among pregnant women.

Introduction

The Papanicolaou (PAP) smear test has been a cornerstone in the prevention and early detection of cervical cancer since its introduction by Dr. George Papanicolaou in the 1940s. This is a test in which cervical cells are sampled and these are checked using a microscope for any pre-cancerous changes. It has also been relied on and widely used hence has played a role in reduction of incidence and mortality due to cervical cancer in females who avail themselves for screening [1]. However, the use of PAP smear during pregnancy has its own implications since the cervical physiology of pregnant woman is different from that of the non-pregnant woman and there is always a challenge of weighing the advantages of screening against disadvantage of exposing the woman and the fetus to harm [2].Pregnancy causes various hormonal changes and also changes in the anatomy of a Woman cervix. These alterations may involve vascularity; glandular swelling; and inversion of the transformation zone, factors which may sometimes contribute to difficulties in the interpretation of the PAP smear results. In this case, involutional processes may be the basis of increased vascularity of the cervix, which may cause bleeding in the process of taking the smear, creates anxiety for the patient, and complicates the analysis of the inflammatory process. Further, hormonal changes that occur during pregnancy is a known factor to cause cytological changes that resemble dysplasia and can therefore cause false positive result. These factors make it necessary that the right expertise in the field of PAP smear reading in pregnant women is observed to avoid unwarranted anxiety and servitudes [3].

Nevertheless, the requirement of PAP smear is vital for cervical cancer screening during pregnancies. According to ACOG, cervical Cancer testing including the PAP smear should not be discontinued

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during pregnancy but carried out if due. This we consider important because pregnancy does not prevent a woman from developing cervical cancer and early diagnosis of cervical dysplasia is vital [4]. PAP smear during pregnancy can discover cervical intraepithelial neoplasia (CIN) when if not treated can develop invasive cervical cancer. Prevention measures that can be employed are effective in decreasing the potential and the likelihood of cancer and bettering the performance of the expecting women and their off springs. Many women who go for PAP smear testing while still pregnant have a lot of fear concerning the effect the procedure could have on the fetus [5]. PAP smears have been known not to pose a threat to pregnant women; there is little or no correlation between the two in cases of miscarriages, pre-term labor or stillbirths. The main complain observed among pregnant women that undertake the test is slight bleeding which is often contains and does not endangered the pregnancy. However, accurate ability in interpretation in PAP smear of pregnant women should take into consideration of pregnancy changes of cervical cytology [6]. Because of the pregnancy-related changes such as presence of decidual cells, the Arias-Stella reaction, and others, it can be rather difficult to differentiate between physiologic pregnancy alterations and a true dysplastic change [7]. In the same way, the effectiveness of PAP smear in pregnant women that attend antenatal clinics is also relative to the follow up care that is readily available [8]. Practical measures for the implementation of cervical screening among pregnant women include the following: Since pregnant women have limited access to health care especially in the developing world, it is important that cervical screening commodities reach the right hands in the right time. A number of pregnant women attend the antenatal clinics for their pregnancy-related healthcare, and therefore incorporating cervical cancer screening in the services offered will recommended cervical cancer incidence in pregnant women [9].

Objective

The main objective of the study is to find the efficacy of PAP smear among pregnant women attending antenatal clinic.

Methodology of the study

This prospective observational study was conducted at ESIC hospital,Gulbargafrom November 2023 to April 2024. Data were collected from 100 pregnant females.

Inclusion Criteria

- Pregnant women attending the antenatal clinic at ESIC Hospital, Gulbarga, during the study period.
- Women aged 18 years and above.

Exclusion Criteria

- Women with a history of cervical cancer or pre-cancerous lesions.
- Women who had undergone a PAP smear test within the past 12 months.
- Women with known bleeding disorders that could complicate the PAP smear procedure.

Data Collection

Data collection was carried out by trained healthcare professionals under the supervision of a gynecologist. Eligible participants were identified during their routine antenatal visits. The participants were first briefed on the goals of the research and written consent was sought from them. Cervical cells were collected from each participant through a cytobrush and a PAP smear was done. The procedure was done in compliance with the clinical protocol in order to maximise patient comfort and obtain suffcient sample volume. The collected samples were immediately immersed in 95% ethanol to fix samples for cytological examination and then transported to pathology laboratory. All smears were fixed and stained by Papanicolaou' s technique and reviewed by a pathologist. The outcomes in relation to the Pap smear were categorized by the Bethesda classification system, and if there were any pathologic changes – ASCUS, LSIL, HSIL, or malignancy. Basic demographic information, medical history particularly obstetrics history and P.A.P smears were also documented in each of the study participants. The following abnormal findings were also recorded: The additional and follow-up tests as recommended were also included.

Statistical Analysis

Data were analyzed using SPSS v 29. The efficacy of the PAP smear in this population was evaluated by calculating the proportion of women with abnormal results. Correlation analyses were performed to explore
associations between demographic variablesand the occurrence of cervical abnormalities.

Results

Data were collected from 100 women, the majority (75%) were between 18 and 30 years old, with 40% aged 18-25 years and 35% aged 26-30 years. Half of the participants were primigravida, while the other half were multigravida. In terms of pregnancy stage, 50% of the women were in their second trimester, 30% in the third trimester, and 20% in the first trimester, reflecting a diverse representation across different stages of pregnancy.

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Table 1: Demographic Characteristics of Participants

Characteristic	Number of Women (n = 100)	Percentage (%)
Age		
18-25 years	40	40%
26-30 years	35	35%
31-35 years	20	20%
36-40 years	5	5%
Gravidity		
Primigravida	50	50%
Multigravida	50	50%
Trimester		
First Trimester	20	20%
Second Trimester	50	50%
Third Trimester	30	30%

10% of the women had atypical squamous cells of undetermined significance (ASCUS), while 6% were diagnosed with low-grade squamous intraepithelial lesions (LSIL). More concerning findings included 3% of women with high-grade squamous intraepithelial lesions (HSIL) and 1% diagnosed with squamous cell carcinoma, highlighting the importance of regular cervical screening during pregnancy.

Table 2: PAP Smear Results Among Participants

PAP Smear Result	Number of Women (n = 100)	Percentage (%)
Negative for Intraepithelial Lesion or Malignancy (NILM)	80	80%
Atypical Squamous Cells of Undetermined Significance (ASCUS)	10	10%
Low-Grade Squamous Intraepithelial Lesion (LSIL)	6	6%
High-Grade Squamous Intraepithelial Lesion (HSIL)	3	3%
Squamous Cell Carcinoma	1	1%

The analysis of factors associated with abnormal PAP smears revealed that women aged 31-40 years had a higher prevalence of abnormalities (28%) compared to those aged 18-30 years (16%). Multigravida women showed a greater percentage of abnormal smears (16%) than primigravida women (10%). Additionally, the prevalence of abnormal PAP smears increased with the progression of pregnancy, with the highest rate observed in the third trimester (23%), followed by the second trimester (12%) and the first trimester (10%).

Table 3: Correlation Between Demographic Factors and Cervical Abnormalities

Factor	Total Number of Women	Number of Abnormal PAP Smears	Percentage of Abnormal PAP Smears (%)
Age			
18-30 years	75	12	16%
31-40 years	25	7	28%
Gravidity			
Primigravida	50	5	10%
Multigravida	50	8	16%
Trimester			
First Trimester	20	2	10%
Second Trimester	50	6	12%
Third Trimester	30	7	23%

The study results indicated that women who had their first sexual activity before the age of 20 had a higher prevalence of abnormal PAP smears (23%) compared to those who began sexual activity at 20 years or older (9%). Regarding contraception use, women using oral contraceptives and intrauterine devices (IUDs) both had a 20% rate of abnormal PAP smears. Those using barrier methods had a lower rate of abnormalities (13%), while women who did not use any contraception had a 15% prevalence of abnormal results.

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Table 4: Distribution of Smears Based on Sexual History and Contraception Use

Category	Total Number of Women (n = 100)	Number of Abnormal PAP Smears	Percentage of Abnormal PAP Smears (%)
Sexual History			
First Sexual Activity < 20 years	30	7	23%
First Sexual Activity ≥ 20 years	70	6	9%
Contraception Use			
Oral Contraceptives	40	8	20%
Intrauterine Device (IUD)	25	5	20%
Barrier Methods	15	2	13%
No Contraception	20	3	15%

Discussion

This study aimed to evaluate the efficacy of PAP smear screening among pregnant women attending the antenatal clinic at ESIC Hospital, Gulbarga. Cervical screening during pregnancy is recommended by these results even in such a population as this presented in this research. The study contributes to the need of understanding the incidence of cervical abnormalities in pregnancy and the importance of constant practice of examination among pregnant mothers[10]. In the course of the study, it was realized that while only 20% of the participants had abnormal PAP smear, 10% of the participants had ASCUS, 6% had LSIL, 3% had HSIL, and 1% had SCC. These results tally with the previous findings where it has been stated that cervical changes while being lesser in pregnant females than in the non-pregnant ones, are, however, detected with relative regularity [11]. It is quite remarkable to note the discovery of a high-grade lesion (HSIL) together with a case of carcinomas of squamous cell type in the present small sample size. They all show the importance of PAP smear screening in the early stage of the potentially lethal diseases. It can also lead to early management which is always wise, especially in pregnant women, because aggressive management of cervical cancer is not as straightforward as in other cancers; there are risks that can afect both the mother and the unborn baby [12]. The results of the correlation analysis indicated that age gravid, and the trimester of pregnancy contributed to the prevalence of the abnormal PAP smears. Women of 31 and older had a higher rate of cervical abnormalities at 28% compared to the younger women 16%, showing that age is a risk factor for the disease and does not disappear even for pregnant women. This observation is in concordance with other epidemiological studies that have established that the susceptibility to cervical dysplasia rises with age [13].

In the same way, multigravida women proved to be slightly more frequently diagnosed with abnormal smear results (16%) than primigravida women (10%). This might have something to do with such facets as hormonal changes and possible exposure to Human Papillomavirus (HPV) which the women in multiple pregnancies undergo over a specified period. The data presented by sexual history and contraceptive utilization demonstrated significant relations with cervical abnormalities [14]. The prevalence of the abnormal smears was relatively higher for women who had their first sexual activity before they were 20 years of age at 23% as compared to those who were sexually active or started at 20 years and above at 9%. Teenage sexual intercourse is accepted to be a cardinal risk factor of many sexually transmitted diseases including HPV which is the leading cause of cervical atypia and cancer. This result emphasizes the need for prevention campaigns to be directed toward reaching younger women so as to reduce the lifelong consequences of engaging in sexual activity at an early age [15]. The results indicated that for contraceptive use, the women on oral contraceptives and IUDs had the highest prevalence of abnormal smears, (20% each) as compared to barrier methods (13%), and non-use of any contraceptive (15%). In different research works, it was mentioned that there is a link between cervical dysplasia and the developmental use of the hormonal contraceptives. Hormonal contraceptives might affect the cervical epithelium – either increase the risk of new HPV infection or the development of the existing cervical intraepithelial neoplasia. These methods have important implications that imply women using them should undertake regular cervical screening [16]. The findings of this study bear several clinical implications: First, they re-emphasise the requirement of ongoing routine cervical screening during pregnancy because pregnant women cannot be excluded from the risk of cervical abnormalities. Thus, due to pregnancy related changes that can either obscure or mimic cervical lesions it is recommended that the PAP smear of pregnant women should be independently interpreted by a qualified cytopathologist.

Conclusion

It is concluded that PAP smear screening is an essential component of antenatal care, effectively detecting cervical abnormalities among pregnant women. Despite the challenges posed by pregnancy-related changes, the benefits of early detection and timely intervention significantly outweigh the risks, ensuring better outcomes for both mother and

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child.Continued efforts to integrate and emphasize cervical screening during pregnancy are crucial for enhancing maternal health.

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