

# A Cross - Sectional Study to Determine the Prevalence of Abnormal Pap Smear in Pregnancy

Dr. Sukhwinder Kaur<sup>1</sup>, Dr. Suniti Verma<sup>2</sup>, Dr. R. N Sehra<sup>3</sup>, Dr. Shrankhla Paliwal<sup>4</sup>

<sup>1</sup>PG Student, Department of Obstetrics and Gynaecology, SMS Medical College, Jaipur

<sup>2</sup>Senior Professor and Unit Head, Department of Obstetrics and Gynaecology, SMS Medical College, Jaipur

<sup>3</sup>Senior Professor, Department of Paediatrics, SMS Medical College, Jaipur

<sup>4</sup>PG Student, Department of Obstetrics and Gynaecology, SMS Medical College, Jaipur

**Abstract:** ***Background:** Cervical cancer ranks among the leading cancers affecting women globally, with over 493, 000 new cases and 274, 000 deaths annually. In India, the incidence rate ranges from 22 to 26.2 cases per lakh women, contributing to a significant mortality rate. The Papanicolaou test, commonly known as the Pap test, is a cervical screening method employed to identify potential pre - cancerous and cancerous conditions in the cervix. **Aim & Objective:** This study aims to explore the prevalence of abnormal Pap smears in pregnant women and emphasize the importance of cervical screening during the antenatal period. **Methods:** This hospital - based observational study was conducted at SMS Medical College & Attached Hospitals, Jaipur, from November 2022. Pregnant women aged over 21 years in their second and third trimesters were recruited. Inclusion criteria included live intrauterine gestation, active marital history for over three years, and informed consent. Exclusion criteria included a history of threatened abortion and recent vaginal interventions. After institutional ethical approval, participants underwent a detailed history and examination, followed by a conventional Pap smear analyzed using the Bethesda classification. **Results:** Among 400 participants, normal smears were observed in 157 women, while inflammation was noted in 243. The highest prevalence of inflammation was found in the 26 - 30 age group. A greater incidence of inflammation was observed among lower - class women. Notably, 80.9% of women with normal smears were multiparous. **Conclusion:** Antenatal visits present a critical opportunity for cervical cancer screening. Pap smears are a safe, cost - effective method for early detection of cervical abnormalities in pregnant women. Enhancing awareness and access to screening is essential for reducing the cervical cancer burden in India.*

**Keywords:** Cervical cancer, Pap smear, pregnancy, screening, public health

## 1. Introduction

Cervical cancer is among the top three most common cancers affecting women worldwide, with over 493, 000 new cases and 274, 000 deaths annually. Notably, 80% of cases occur in developing countries, particularly among women in their third decade of life, coinciding with their peak childbearing years.<sup>1</sup> In India, cervical cancer has a high incidence rate of 22 to 26.2 cases per lakh women, and it remains the leading cause of cancer - related deaths, with an estimated 74, 000 deaths annually. Indian women face a cumulative lifetime risk of 2.5% and a cumulative death risk of 1.4% from cervical cancer.<sup>2</sup>

Cervical abnormalities are more common among women of reproductive age, those from low socioeconomic backgrounds, and those who initiate sexual activity early. Limited awareness, social stigma, and delayed healthcare - seeking behavior hinder screening efforts.<sup>5</sup> However, pregnancy provides an opportunity for cervical screening, with the Pap smear being an effective tool for detecting pre - invasive lesions.<sup>3</sup> The Papanicolaou test (Pap smear) is a widely used, cost - effective screening method, instrumental in reducing cervical cancer incidence by up to 79% in countries with organized screening programs. Although highly specific (60 - 95%), its sensitivity ranges between 47 - 62%, often due to sampling and interpretation errors.<sup>4</sup>

Human papillomavirus (HPV), particularly types 16 and 18, plays a central role in the development of cervical cancer, accounting for 70% of cases. The Pap test can detect 60 - 70%

of cervical cancers, and its efficacy remains similar during pregnancy. Pre - cancerous cervical lesions (CIN) have a peak incidence in women aged 25 - 35, making antenatal visits a crucial period for screening.<sup>5</sup> Cervical abnormalities in pregnancy range from 0.72% to 1.67%, and CIN occurs in 1.3 per 1000 pregnancies, with no significant difference in rates between pregnant and non - pregnant women. The American College of Obstetricians and Gynecologists (ACOG) recommends screening every three years for women aged 21 - 65, offering an opportunity for timely detection during pregnancy.<sup>6</sup>

Despite the effectiveness of Pap testing, its implementation in India faces challenges due to lack of awareness, misconceptions, and social barriers. Antenatal counseling presents a critical opportunity to educate women about cervical cancer screening and increase participation. Organized screening programs in high - income countries have significantly reduced cervical cancer mortality rates, a success not yet mirrored in low - and middle - income countries due to the absence of systematic programs.<sup>7</sup>

This study aims to explore the prevalence of abnormal Pap smears in pregnant women and highlight the importance of expanding cervical screening during the antenatal period.

## 2. Material and Method

This hospital - based observational study was a cross - sectional prospective study conducted in the Department of Obstetrics and Gynecology at SMS Medical College &

Attached Hospitals, Jaipur. The study spanned from November 2022 until either the completion of the sample size or one year, followed by two months for data analysis and compilation. The study included pregnant women attending the antenatal OPD, focusing on those aged above 21 years in their second and third trimesters, with a marital history of over three years.

**Inclusion Criteria:**

- Pregnant women (2nd/3rd trimester) with live intrauterine gestation.
- Age > 21 years.
- Active married life > 3 years.
- Provided informed, written consent.
- Not participating in any other study.

**Exclusion Criteria:**

- History of threatened abortion in current pregnancy.
- Sexual intercourse, vaginal douching, or medication in the last 48 hours.
- History of vaginal bleeding or acute infections.
- Women in labor or with PROM.

**Statistical Analysis**

As per data, all data was entered in the EXCEL sheet, tabulated and analyzed using SPSS version 22.0. Quantitative data was summarized using mean and Standard Deviation. Quantitative data was summarized using proportions.

**Methodology:**

After institutional ethical committee approval, a detailed history and examination were conducted, noting age, parity,

socioeconomic status, and high - risk behaviors. A conventional pap smear was performed using an ayers spatula and cytobrush. Smears were fixed and sent for cytological analysis based on bethesda classification: inadequate, negative, inflammatory, ascus/agg, lsil/hsil, squamous cell carcinoma, or adenocarcinoma in situ. Patients were informed of possible self - limiting vaginal spotting post - procedure.

**3. Results and Observation**

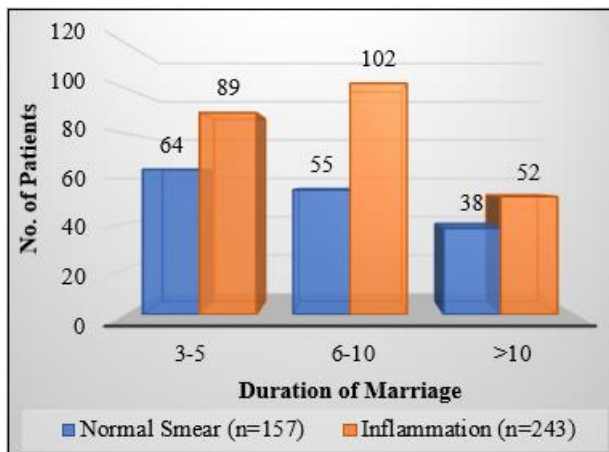
In the 20 - 25 years age group (117 patients), 50 had a normal smear and 67 had inflammation. Among 185 patients aged 26 - 30, 70 had normal smears and 115 had inflammation. In the 31 - 35 group (85 patients), 33 had normal smears and 52 had inflammation. For ages 36 - 40 (10 patients), 3 had normal smears and 7 had inflammation, while in those over 40 (3 patients), 1 had a normal smear and 2 had inflammation. Among patients with normal smears, 95 were Hindu, 62 Muslim, 47 were rural, and 110 were urban. For inflammation, 138 were Hindu, 105 Muslim, 83 rural, and 160 urban. Socio - economically, 79 with normal smears were lower class, 70 middle, and 8 upper, compared to 113 lower, 120 middle, and 10 upper with inflammation. Education - wise, normal smears were seen in 31 illiterate, 37 with primary, 43 secondary, 26 high school, and 20 graduates, while inflammation was present in 54 illiterate, 55 with primary, 68 secondary, 45 high school, and 21 graduates. Most patients with normal smears were housewives (114), laborers (26), or in service (17), while those with inflammation included 180 housewives, 36 laborers, and 27 in service.

**Table 1:** Distribution of patients according to Parity.

Parity	Total		Normal Smear (n=157)		Inflammation (n=243)		P - Value
	No. of Patients	Percentage	No. of Patients	Percentage	No. of Patients	Percentage	
Nullipara	77	19.25	32	8	45	11.25	0.25
Multipara	323	80.75	125	31.25	198	49.5	0.0003
Total	400	100	157	39.25	243	60.75	

The table shows parity distribution between the Normal Smear (n=157) and Inflammation (n=243) groups. In the Normal Smear group, 32 patients were nulliparous, and 125 were multiparous. In the Inflammation group, 45 were nulliparous, and 198 were multiparous.

The table compares the duration of marriage between the Normal Smear (n=157) and Inflammation (n=243) groups. In the Normal Smear group, 64 patients had been married for 3 - 5 years, 55 for 6 - 10 years, and 38 for over 10 years. In the Inflammation group, 89 patients had been married for 3 - 5 years, 102 for 6 - 10 years, and 52 for over 10 years.



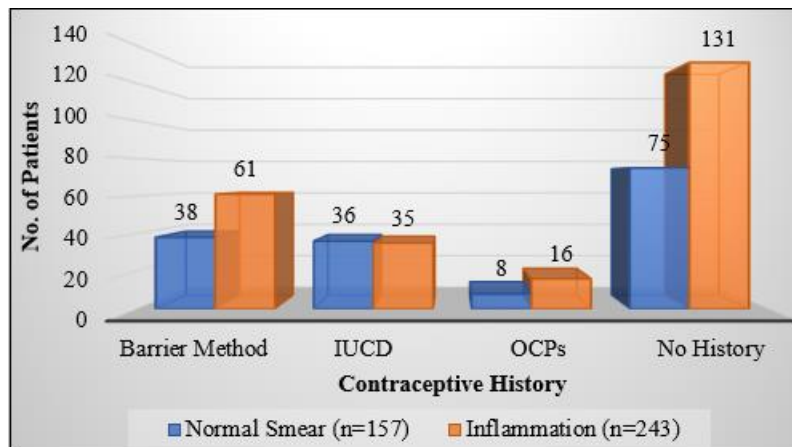
**Figure 1:** Distribution of patients according to Duration of Marriage

**Table 2:** Distribution of patients according to Age at the Time of 1st Delivery.

Age at the time of 1st delivery	Total		Normal Smear (n=157)		Inflammation (n=243)		P - Value
	No. of Patients	Percentage	No. of Patients	Percentage	No. of Patients	Percentage	
18 - 25	363	90.75	147	36.75	216	54	0.0008
26 - 30	32	8	9	2.25	23	5.75	0.095
31 - 35	0	0	0	0	0	0	-
>35	5	1.25	1	0.25	4	1	0.38
Total	400	100	157	39.25	243	60.75	
Mean±SD	21.68±3.12		21.54±2.69		21.78±3.37		

The table compares the age at first delivery between the Normal Smear (n=157) and Inflammation (n=243) groups. In the Normal Smear group, 147 patients had their first delivery

at 18 - 25 years, 9 at 26 - 30 years, and none above 30. In the Inflammation group, 216 had their first delivery at 18 - 25 years, 23 at 26 - 30 years, and 4 were over 35 years old.



**Figure 2:** Distribution of patients according to Contraceptive History

The table compares contraceptive histories between the Normal Smear (n=157) and Inflammation (n=243) groups. In the Normal Smear group, 38 patients used the barrier method, 36 used IUCD, 8 used OCPs, and 75 had no contraceptive

history. In the Inflammation group, 61 used the barrier method, 35 used IUCD, 16 used OCPs, and 131 had no contraceptive history.

**Table 3:** Distribution of patients according to Per Speculum Examination.

Per Speculum Examination	Total		Normal Smear (n=157)		Inflammation (n=243)		P - Value
	No. of Patients	Percentage	No. of Patients	Percentage	No. of Patients	Percentage	
Discharge	82	20.5	27	6.75	55	13.75	0.029
Cervical Lesion	1	0.25	0	0	1	0.25	0.5
Healthy	317	79.25	130	32.5	187	46.75	0.0047
Total	400	100	157	39.25	243	60.75	

The table compares per speculum examination findings between the Normal Smear (n=157) and Inflammation (n=243) groups. In the Normal Smear group, 27 had discharge, and 130 were reported as healthy, with no cervical lesions. In the Inflammation group, 55 had discharge, 1 had a cervical lesion, and 187 were reported as healthy.

#### 4. Discussion

Cervical cancer is preventable and detectable through PAP smears, the primary screening tool for identifying pre - invasive lesions that could progress to carcinoma if untreated. Guidelines recommend PAP screening from age 21 for sexually active women, every three years, with HPV co - testing every five years. This approach targets peri - menopausal women and addresses early pre - malignant changes. In pregnant women, PAP smears also detect asymptomatic genital infections, potentially affecting pregnancy outcomes. The test identifies cervical

abnormalities, dysplasia, and infections, with cervical cancer contributing to 3.3% of vaginal discharge cases.<sup>8</sup>

In our study, among patients with a normal Pap smear (n=157), 32 were nulliparous and 125 were multiparous. In the inflammation group (n=243), 45 were nulliparous and 198 were multiparous. **Similarly, Mishra V et al.9** reported that 25.3% (80) of their participants were Para - 0, 42.7% (135) were Para - 1, and 32.0% (101) were Para >1. **Priya S S et al.6** found that most of their study subjects were primigravida (42.5%), followed by second gravid (37.5%), with only 7% being fourth gravid.

In our study, 64 patients in the Normal Smear group had been married for 3 - 5 years, 55 for 6 - 10 years, and 38 for over 10 years. In the Inflammation group, 89 patients had been married for 3 - 5 years, 102 for 6 - 10 years, and 52 for over 10 years. **Similarly, Siddiqui S<sup>10</sup>** categorized marriage age into two groups: less than 20 years and 20 years or older, finding that 59% of those married before 20 were NILM

without infection, compared to 76% of those married at 20 or older, suggesting a link between marriage age and cervical health.

Our study analyzed the age distribution of first deliveries in the Normal Smear (n=157) and Inflammation (n=243) groups. In the Normal Smear group, 147 patients delivered between 18 - 25 years, 9 between 26 - 30 years, and none between 31 - 35 or over 35 years. In the Inflammation group, 216 patients delivered between 18 - 25 years, 23 between 26 - 30 years, none between 31 - 35 years, and 4 over 35 years. **Siddiqui S<sup>10</sup>** found that among participants with a first delivery before 20 years, 40% (11) were NILM without infection, while 76% (303) of those delivering at 20 years or older were NILM without infection.

In our study, among the Normal Smear group (n=157), 38 patients used barrier methods, 36 used IUCD, 8 used OCPs, and 75 had no contraceptive history. In the Inflammation group (n=243), 61 used barrier methods, 35 used IUCD, 16 used OCPs, and 131 had no contraceptive history. **Mukhtar N F et al.<sup>11</sup>** found that 45% (264) of respondents had a contraceptive history, while 55% (323) were not using contraception. **Ekwedigwe K C et al.<sup>12</sup>** reported that 75.5% (83) of women did not use contraceptives. Regarding cervical health, in the Normal Smear group, 27 had discharge, and 130 were healthy with no lesions. The Inflammation group had 55 with discharge, 1 with a cervical lesion, and 187 healthy patients. **Priya S S et al.<sup>6</sup>** reported that 89% of antenatal mothers had healthy cervixes, while 10% had an eroded cervix and 1% had cervical growth. **Pokharel A et al.<sup>13</sup>** found a healthy cervix in 77.5% of participants, with 2% showing cervical growth.

## 5. Conclusion

Antenatal visits provide an opportunity for screening and education on early detection of cervical cancer. Pap smears are cost - effective, easy to perform, and safe for pregnant women, ensuring early identification and management of cervical abnormalities. Raising awareness about Pap smears is crucial in addressing the significant public health challenge of cervical cancer in India. Community outreach and educational campaigns can enhance screening access and reduce morbidity and mortality. Prioritizing these measures can improve outcomes for pregnant women and decrease the impact of cervical cancer on women's health.

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