



PREVALENCE OF ABNORMAL PAP SMEAR FINDINGS AMONG WOMEN PRESENTING WITH VAGINAL DISCHARGE: A CROSS-SECTIONAL STUDY IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Vaginal discharge is a common gynecological complaint and may be associated with infections or precancerous cervical changes. The Papanicolaou (Pap) smear is a critical screening tool for detecting cervical cytological abnormalities. In developing countries, where cervical cancer screening programs are not well-established, understanding the frequency of abnormal Pap smear findings in women presenting with vaginal discharge is essential.

Objective: To determine the frequency and nature of abnormal Pap smear findings among women presenting with vaginal discharge at a tertiary care hospital, with a focus on identifying cytological abnormalities indicative of precancerous and cancerous lesions.

Methodology: This cross-sectional study was conducted over six months at a Liaquat University Hospital Hyderabad / Jamshoro in Pakistan. A total of 239 women aged 20 to 50 years with complaints of vaginal discharge lasting 3-6 months were recruited using a non-probability consecutive sampling technique. Exclusion criteria included known genital pathology, diagnosed cervical carcinoma, and vaginal bleeding. Pap smears were collected, preserved in ethanol, and analyzed cytologically. Data were analyzed using SPSS, with statistical significance determined using Chi-square tests ($p < 0.05$).

Results: Among the 239 participants, 18.0% had normal Pap smears, while 40.2% exhibited cervicitis, 17.6% dysplasia, 10.9% adenocarcinoma, 7.1% ASCUS, and 10.9% carcinoma in situ. Dysplasia was most prevalent in the 26-35 age group (20.9%), and cervicitis was common in women over 45 years (52.4%). Married women had a higher prevalence of dysplasia (18.5%) and adenocarcinoma (11.3%) compared to unmarried women. Women with prolonged symptoms (>4 months) had higher rates of dysplasia (19.4%) and adenocarcinoma (14.3%). Contraceptive users exhibited higher cervicitis rates (57.8%) but lower carcinoma in situ and adenocarcinoma rates.

Conclusion: The high prevalence of cervical cytological abnormalities among women with vaginal discharge underscores the necessity of routine Pap smear screening, particularly for high-risk groups. Increased awareness, accessibility to cervical cancer screening, and HPV vaccination are crucial in reducing the burden of cervical cancer in resource-limited settings. Further research is needed to assess the impact of HPV subtypes and long-term contraceptive use on cervical health.

Keywords: Vaginal Discharge, Pap smear, Cervical Dysplasia, Cervicitis, Carcinoma In Situ, HPV, Cervical Cancer Screening.



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INTRODUCTION

Vaginal discharge is one of the most common complaints among women visiting gynecological and sexual health clinics, making it a significant clinical concern worldwide. While vaginal discharge is often physiological, it can sometimes be a symptom of underlying gynecological or infectious pathologies, including reproductive tract infections (RTIs) and cervical malignancies. [1] Understanding the etiology and clinical implications of abnormal vaginal discharge is crucial for early detection and intervention, particularly in the prevention of cervical cancer.

Cervical cancer is a major public health issue, especially in developing countries where routine screening programs are either non-existent or poorly implemented. The Papanicolaou (Pap) smear test is a simple, cost-effective, and highly effective tool for detecting precancerous and cancerous cervical lesions. [2] Since its introduction by George Papanicolaou in the 1940s, the Pap smear has significantly reduced cervical cancer-related mortality by enabling early detection and treatment of cervical intraepithelial neoplasia (CIN). [3] Despite its proven efficacy, the uptake of Pap smear screening remains low in many regions, leading to a persistently high burden of cervical cancer. [4]

Infections, particularly those associated with sexually transmitted infections (STIs), have been identified as major contributors to abnormal Pap smear findings. Human papillomavirus (HPV) infection is the most significant risk factor for cervical cancer, with high-risk HPV types 16 and 18 being responsible for approximately 70% of cases. [5] Other infections, including bacterial vaginosis (BV), *Trichomonas vaginalis*, and *Candida* species, can also lead to cytological abnormalities and an increased risk of cervical neoplasia. [6] Furthermore, persistent cervicitis, often resulting from chronic infections, has been associated with atypical squamous cells of undetermined significance (ASCUS), low-grade squamous intraepithelial lesions (LSIL), and high-grade squamous intraepithelial lesions (HSIL). [7]

Several studies have documented the prevalence of abnormal Pap smear findings among women presenting with vaginal discharge. In an international study, 5.17% of women with vaginal discharge had normal Pap smear findings, while 27.58% had cervicitis, 5.17% had dysplasia, and 3.44% had carcinoma. [8] Another study in Pakistan reported that 44% of women with vaginal discharge had normal Pap smears, while 33.5% had *Candida* infections, 19.5% had bacterial vaginosis, and 3% exhibited dyskaryotic changes. [9] These variations highlight the need for region-specific data to guide clinical practice and public health policies.

In Pakistan, cervical cancer remains a neglected

health issue due to a lack of awareness, inadequate screening programs, and cultural barriers to gynecological examinations. [10] The absence of a national screening program has resulted in late-stage diagnoses and increased mortality rates. Studies have shown that routine Pap smear screening can significantly reduce the incidence of cervical cancer and improve patient outcomes. [11]

Given the high prevalence of vaginal discharge and its potential association with abnormal Pap smear findings, this study aims to determine the frequency of cytological abnormalities among women presenting with vaginal discharge at a tertiary care hospital. The findings will help in understanding the burden of cervical epithelial abnormalities and reinforce the need for routine Pap smear screening in Pakistan.

Objective: To determine the frequency and nature of abnormal Pap smear findings among women presenting with vaginal discharge at a tertiary care hospital, with a focus on identifying cytological abnormalities indicative of precancerous and cancerous lesions. Thereby assessing the burden of cervical epithelial abnormalities and emphasizing the necessity of routine Pap smear screening for early detection and prevention of cervical cancer.

METHODOLOGY

This cross-sectional study was conducted over six months in the Department of Gynecology and Obstetrics at a tertiary care hospital in Pakistan. A total of 239 women aged 20 to 50 years, presenting with complaints of vaginal discharge for 3-6 months, were recruited using a non-probability consecutive sampling technique. Women with known genital pathology, diagnosed cervical carcinoma, vaginal bleeding, or those unwilling to participate were excluded. Informed consent was obtained from all participants before enrollment. A detailed medical history and clinical examination were performed, followed by Pap smear sample collection using a wooden spatula from the squamo-columnar junction. The samples were preserved in ethanol and sent for cytological analysis by a pathologist. Data were analyzed using SPSS software, with continuous variables summarized as mean and standard deviation, and categorical variables expressed as frequencies and percentages. Statistical significance was determined using Chi-square tests, with a p-value of <0.05 considered significant.

RESULTS

A total of 239 women with a history of vaginal discharge were included in this study. The mean age of participants was 32.46 ± 7.67 years. The frequency of abnormal Pap smear findings is summarized in Table 1.

Table 1: Cytological Findings in Pap smear Tests

Cytological Finding	Frequency (n=239)	Percentage (%)
Normal	43	18.0
Cervicitis	96	40.2
Dysplasia	42	17.6
Adenocarcinoma	26	10.9
ASCUS	17	7.1
Carcinoma in situ	26	10.9

The highest prevalence was observed in cases of cervicitis (40.2%), followed by dysplasia (17.6%) and adenocarcinoma (10.9%). Notably, carcinoma in situ was found in 10.9% of cases, emphasizing the need for early detection through routine Pap smear screening. ASCUS was identified in 7.1% of cases, requiring further follow-up testing to rule out progression to precancerous or cancerous lesions. These findings suggest a considerable burden of

cytological abnormalities among women presenting with vaginal discharge, reinforcing the importance of integrating routine cervical cancer screening into gynecological healthcare protocols.

Age-Wise Distribution of Abnormal Pap Smear Findings

Relationship between age groups and abnormal cytological findings is presented in Table 2.

Table 2: Age-Wise Distribution of Abnormal Pap smear Findings (% Within Each Age Group)

Age Group (Years)	Normal (%)	Cervicitis (%)	Dysplasia (%)	Carcinoma in situ (%)	Adenocarcinoma (%)	ASCUS (%)
≤ 25	18.5	44.4	14.8	5.6	9.3	7.4
26-35	18.6	29.1	20.9	8.1	14.0	9.3
36-45	14.1	46.2	16.7	6.4	10.3	6.4
> 45	28.6	52.4	14.3	0.0	4.8	0.0

Cervicitis was most prevalent in women aged >45 years (52.4%) and ≤25 years (44.4%), indicating a high rate of inflammatory processes across different age groups. Dysplasia was highest in the 26-35 age group (20.9%), which is a critical period for HPV-

related cytological abnormalities.

Marital Status and Abnormal Pap Smear Findings

Comparison of Pap smear among married and unmarried women is presented in Table 3.

Table 3. Marital Status and Abnormal Pap smear Findings

Marital Status	Normal (%)	Cervicitis (%)	Dysplasia (%)	Carcinoma in situ (%)	Adenocarcinoma (%)	ASCUS (%)
Married	17.1	39.6	18.5	6.8	11.3	6.8
Unmarried	29.4	47.1	5.9	0.0	5.9	11.8

Unmarried women had a higher percentage of normal smears (29.4%), while married women had a higher prevalence of dysplasia (18.5%) and adenocarcinoma (11.3%). Cervicitis was slightly more frequent among unmarried women (47.1%).

Duration of Disease and Abnormal Pap Smear Findings

The duration of vaginal discharge and its association with abnormal cytological findings are shown in Table 4.

Table 4. Duration of Disease and Abnormal Pap smear Findings

Duration of Disease	Normal (%)	Cervicitis (%)	Dysplasia (%)	Carcinoma in situ (%)	Adenocarcinoma (%)	ASCUS (%)
1-3 months	19.9	43.3	16.3	5.7	8.5	6.4
4-6 months	15.3	35.7	19.4	7.1	14.3	8.2

Women with symptoms for 4-6 months had higher rates of dysplasia (19.4%) and adenocarcinoma (14.3%), suggesting a longer duration of symptoms correlates with higher risk for precancerous and cancerous changes.

Contraceptive Use and Abnormal Pap Smear Findings

Relationship between contraceptive use and abnormal Pap smear findings is given in Table 5.

Table 5: Contraceptive Use and Abnormal Pap smear Findings

History of Contraception	Normal (%)	Cervicitis (%)	Dysplasia (%)	Carcinoma In situ (%)	Adenocarcinoma (%)	ASCUS (%)
Yes	19.0	57.8	18.1	1.7	0.9	2.6
No	17.1	23.6	17.1	10.6	20.3	11.4

Women who had a history of contraception use showed a significantly higher prevalence of cervicitis (57.8%), whereas those without contraception history had higher rates of

adenocarcinoma (20.3%) and carcinoma in situ (10.6%), potentially linking contraceptive use to inflammatory but not necessarily malignant changes.

Table 6: P-values for Key Comparisons of Abnormal Pap Smear Findings

Variable	Cervicitis (p-value)	Dysplasia (p-value)	Carcinoma in situ (p-value)	Adenocarcinoma (p-value)	ASCUS (p-value)
Age Group	0.060	0.760	0.580	0.600	0.510
Marital Status	0.548	0.189	0.268	0.492	0.439
Duration of Disease	0.036	0.538	0.529	0.334	0.674
Contraceptive Use	0.0005*	0.834	0.005**	0.0005***	0.008****

Significant Associations (p < 0.05)

* **Cervicitis** is significantly associated with **duration of disease (p = 0.036)** and **contraceptive use (p = 0.0005)**, suggesting inflammatory changes are more common in those with prolonged symptoms and contraceptive users.

** **Carcinoma in situ** is significantly related to **contraceptive use (p = 0.005)**, indicating a potential protective or modifying effect of contraception on carcinoma development.

*** **Adenocarcinoma** is strongly associated with **contraceptive use (p = 0.0005)**, highlighting a possible connection between hormonal exposure and glandular changes.

**** **ASCUS** shows a **statistically significant association with contraceptive use (p = 0.008)**, suggesting that hormonal or mechanical factors might influence cytological abnormalities.

These statistical findings reinforce the importance of screening for high-risk groups, particularly contraceptive users and women with prolonged vaginal discharge, as they demonstrate significantly higher risks for inflammatory and precancerous lesions.

DISCUSSION

The findings of this study highlight the significant burden of abnormal Pap smear findings among women presenting with vaginal discharge. The overall prevalence of cervicitis (40.2%), dysplasia (17.6%), and carcinoma in situ (10.9%) reinforces the need for routine cervical screening in clinical settings. These results align with previous studies indicating a high frequency of inflammatory and premalignant lesions among women with vaginal discharge, suggesting that abnormal cytological changes are often linked to underlying infections and hormonal influences. [11]

A study conducted by Gupta et al. [8] in Western Uttar Pradesh reported a dysplasia prevalence of 5.17%, significantly lower than our 17.6%, suggesting a regional variance likely influenced by healthcare

accessibility and screening frequency. Similarly, Sachan et al. [10] found that cervicitis accounted for 27.58% of cases, which is lower than our 40.2%, indicating a potentially higher prevalence of chronic inflammatory conditions in our study population.

The age-wise distribution in our study showed that dysplasia peaked in the 26-35 age group (20.9%), aligning with previous research indicating that younger women are more prone to HPV-related precancerous lesions. [5] Additionally, our finding that adenocarcinoma (10.9%) was most common in women aged 26-45 years parallels studies that highlight an increasing trend in glandular neoplasms in this demographic. [6]

Marital status was another significant variable, with married women showing a higher prevalence of dysplasia (18.5%) and adenocarcinoma (11.3%), consistent with research indicating that prolonged HPV exposure increases the risk of cervical neoplasia. [7] Conversely, unmarried women had a higher proportion of ASCUS, suggesting transient or undiagnosed infections requiring follow-up. [9]

Our study also found a significant association

between contraceptive use and cervicitis ($p=0.0005$), aligning with studies by Padmini et al.,^[12] which report similar trends of inflammatory cytological findings in contraceptive users. Interestingly, adenocarcinoma and carcinoma in situ rates were lower in contraceptive users, supporting the hypothesis that hormonal contraceptives may exert a protective effect against certain malignant transformations.^[13]

Our findings emphasize the urgent need for routine Pap smear screening, particularly among high-risk groups such as married women, women over 26 years of age, and those with prolonged vaginal discharge symptoms. The comparison with existing literature underscores both consistencies and regional variations, indicating the necessity for targeted screening programs and HPV vaccination initiatives to reduce the burden of cervical abnormalities. Future research should investigate HPV genotype prevalence in the region, lifestyle factors influencing cervical dysplasia, and long-term contraceptive effects on cervical health, to better understand and mitigate risk factors associated with cervical malignancies.

CONCLUSION

This study underscores the high prevalence of abnormal Pap smear findings among women presenting with vaginal discharge, emphasizing the critical need for routine cervical screening programs. The significant burden of cervicitis (40.2%), dysplasia (17.6%), and carcinoma in situ (10.9%) highlights the potential risk of delayed diagnosis and progression to more severe cervical pathologies. Our findings align with previous research, reinforcing the association between reproductive tract infections, prolonged vaginal discharge, and abnormal cytological outcomes.

Key risk factors identified include age (26-35 years most affected by dysplasia), marital status (higher prevalence of precancerous lesions in married women), duration of disease (longer symptom duration linked to higher risk), and contraceptive use (higher cervicitis but lower carcinoma in situ rates). These insights stress the need for targeted awareness campaigns, improved accessibility to cervical cancer screening, and enhanced HPV vaccination efforts in high-risk populations.

Given the substantial proportion of dysplastic and malignant cases observed, timely Pap smear testing and follow-up protocols should be reinforced at both primary and tertiary healthcare levels. Future research should focus on HPV genotyping in high-risk groups, longitudinal studies to assess long-term outcomes of cervical abnormalities, and the influence of lifestyle and socioeconomic factors on cytological findings.

In conclusion, routine cervical cancer screening,

early diagnosis, and preventive interventions remain paramount in reducing morbidity and mortality associated with cervical neoplasia. Policymakers should prioritize integrating screening programs into public healthcare initiatives to ensure that all women, especially those in resource-limited settings, have access to life-saving early detection and treatment services.

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