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## Prospective Study on Spectrum of Cervical Cytology in Papanicolaou Smears of Symptomatic Women in a Tertiary Care Hospital in Southern Rajasthan

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### ABSTRACT

Cervical cancer is the fourth leading cause of death in females worldwide. In developing countries like India cervical cancer is the leading cause of morbidity and mortality. Cancer of the cervix can be prevented and diagnosed earlier at the pre-malignant stage with adequate and repetitive cytological screening by Papanicolaou (Pap) smears. This study aimed to study the role of a Pap smear in detecting non-neoplastic, premalignant, and malignant lesions of the cervix and the prevalence of different lesions in women who received a traditional Pap smear technique. It is a prospective cross-sectional study of 800 pap smears studied from June 2022 to May 2023 received in the department of obstetrics and gynecology in a tertiary care hospital. Samples were collected from women between 20 and 80 years presenting with some gynecological problems. Smears were reported as per the 2014 Bethesda system. Out of 800 women, 683 (85.4%) had NILM findings on pap smear and 42 (5.2%) had epithelial cell abnormality. However, 75 (9.4%) were found to be unsatisfactory. Out of those with epithelial cell abnormality, 24 (3%) cases of ASCUS, 8 (1%) cases of HSIL, 5 (0.6%) cases of LSIL, 3 (0.4%) cases of SCC and 2(0.2%) cases of AGUS were observed. A Pap smear is simple, non-invasive, cost-effective and easy to perform for the detection of precancerous lesions in a gynecological patient. Every woman should undergo a Pap test at least once in her life. A pap smear should start from 25 years to be done till 65 years (repeated after every 3 years).

## INTRODUCTION

Cervical cancer is one of the gravest threats to women's well-being and lives worldwide, despite being a preventable disease. One woman dies from this cancer every two minutes. It is the fourth most common cancer and the fourth leading cause of cancer death among women all over the world<sup>[1]</sup>. New data published by the World Health Organization in June 2021 quantified for the first time that women with cervical cancer typically experience suffering that is more complex and severe than that caused by other serious illnesses<sup>[2]</sup>. Screening a woman just once in her life after age 35 decreases her risk of dying from cervical cancer by 70%. Her risk of dying from cervical cancer drops by more than 85% if she is screened every 5 years. However, more than 1.5 billion women worldwide have never been screened for cervical cancer. As per Globocan 2020, in India, cervical cancer accounted for 9.4% of all cancers and 18.3% (123,907) of new cases<sup>(2)</sup>. About 70% of those diagnosed with cervical cancer are at the advanced stages, with nearly 60,000 deaths each year<sup>[3]</sup>. According to ACS guidelines for cervical cancer screening, it is recommended that screening should begin in average-risk individuals at age 25 years and cease at age 65 years<sup>[4]</sup>. ACOG recommends Pap smear screening starting at 21 years of age until the age of 65 years and should be repeated at 3-year intervals. In addition, human papillomavirus (HPV) tests may be performed for abnormal Pap smear tests or as dual testing. In case of an abnormal Pap smear report, depending on the type of abnormality the test may need to be repeated in 6-12 months<sup>[5,6]</sup>. The situation of cancer prevalence is alarming in rural populations where the majority of women are illiterate and ignorant about the factors contributing to the development of cervical cancer. In addition, medical facilities, advice and awareness programs are almost non-existent<sup>[7]</sup>. Several risk factors have been associated with cervical cancer, namely, illiteracy, low socioeconomic status, long duration of married life, early menarche, early marriage, early first childbirth, age at last childbirth, multiparity, multiple sexual partners, late menopause, genital infection, poor genital hygiene, tobacco use, passive smoking and contraceptive use<sup>[8]</sup>.

**Pathogenesis:** The ectocervix is covered by mature squamous mucosa, whereas the endocervix is lined by mucus-secreting endocervical epithelium. The latter undergoes squamous metaplasia. Most cervical squamous cell carcinomas likely originate from the metaplasia squamous epithelium located between the original and new squamocolumnar junctions, the transformation zone. Adenocarcinomas typically occur within the endocervical canal<sup>[9]</sup>. The Pap test has been the mainstay of cervical cancer screening for decades. A Pap smear is the most common and widely accepted

method of collection. In this, cells are collected from the complete SCJ and the adjacent TZ<sup>[4]</sup>. Reporting pap smears using the revised Bethesda System has unified various overlapping terminologies and created a standardized framework for laboratory reports<sup>[10]</sup>. Hence, we have undertaken the present study using the revised Bethesda system 2014, intending to study the pattern of various cervical smear abnormalities in our center and to study the prevalence of epithelial cell abnormalities in our study population.

## Aims and Objectives:

- To find out the incidence of abnormal pathology by pap smear screening among patients visiting our OPD.
- To determine the pattern of various cervical smear abnormalities at our center.
- To study the prevalence of epithelial cell abnormalities in our study population.

## MATERIALS AND METHODS

This is a prospective cross-sectional observational study conducted at GBH American Hospital and Medical College, Udaipur. 800 females were screened by pap smear test, for a period of one year from June 2022 to May 2023. Data was collected under various categories like age distribution, presenting complaints of the females and per speculum examination findings. Their corresponding pap smear was taken and examined according to the Bethesda system<sup>[9]</sup>. Cytology results were noted, i.e., the incidence of non-neoplastic and neoplastic abnormality. The data was then analyzed for incidence of age-wise distribution of presenting complaints, age-wise distribution of various non-neoplastic lesions of the cervix and age-wise distribution of various neoplastic lesions of the cervix. The incidence was finally calculated in terms of percentage. Prior permission from the competent authority was obtained for conducting the study.

## Inclusion Criteria:

- Age 21-80 years.
- Sexually active women.
- Women with complaints of bleeding per vaginum, foul-smelling whitish vaginal discharge, or something coming out of the vagina.
- Postmenopausal women with postcoital bleeding.

## Exclusion Criteria:

- Unmarried females.
- Women without sexual exposure.
- Pregnant women.
- Women diagnosed with cases of cervical carcinoma.
- Women above 80 years of age.

## RESULTS AND DISCUSSIONS

- **Abbreviations:** NILM: Negative for intra epithelial lesion or malignancy.
- **ASCUS:** Atypical squamous cell of undetermined significance.
- **LSIL:** Low-grade intra epithelial lesion.
- **HSIL:** High-grade intra epithelial lesion, SCC: Squamous cell carcinoma.
- **AGUS:** Atypical glandular cells of undetermined significance.

This study was conducted at a tertiary care hospital in Udaipur. The study includes 800 women and all were categorized into different groups depending on their age. The highest number of the study population (36%) were in the age group of 41-50 years, followed by 31-40 years (35.4%) and the least number (1.6%) were above 70 years of age. However, studies conducted by Agrawal<sup>[10]</sup>, Joshi<sup>[11]</sup>, Vedvathi<sup>[12]</sup> and Jadav<sup>[13]</sup> had the majority of patients in the third decade followed by the fourth decade (Table 1).

This reveals that Pap smear cytology is still delayed by many years in a majority of women in this country. Physicians or healthcare professionals should request Pap smear testing and should educate people about the benefits of the Pap smear test. A study by Abraham *et al.* reported that women with better education and easy accessibility to healthcare services were more likely to seek treatment for gynecological symptoms at the initial stages and hence, show a reduced prevalence of gynecological morbidities<sup>[14]</sup>. Our study population constituted a vulnerable population with low literacy levels, low socio-economic status and distinct socio-cultural practices such as early age at marriage and pregnancy.

This might also have contributed to the higher proportion of symptoms suggestive of gynecological morbidities among these women. In our study 73.2% of women complained of vaginal discharge, 14.2% had irregular menses, 8.8% had complained of something coming out of the vagina and 3.8% had postmortal bleeding. Agrawal<sup>[10]</sup>, Joshi<sup>[11]</sup> and Rekha<sup>[15]</sup> also recorded white discharge as the most common presenting complaint in their respective studies (Table 2).

Out of 800 cases in our study, 75 cases (9.4 %) were unsatisfactory for evaluation. Studies by Agrawal<sup>[10]</sup>, Joshi<sup>[11]</sup> and Jadav<sup>[13]</sup> had 4.17%, 2% and 5.18% unsatisfactory smears respectively. In our study, when we analyzed the smears, 85.4% were negative for intra epithelial lesions or malignancy and 5.2% of smears were classified as epithelial lesions. This was comparable with the study of Agrawal<sup>[10]</sup> and Joshi<sup>[11]</sup>, who found 90% and 80.8% NILM cases and 5.83% and 2.82% epithelial lesions, respectively (Table 3). In cases with negative for intra epithelial lesions, 683 cases (75.6%) were inflammatory and 5 cases (0.6%) were

atrophic smears. 60 cases (7.6%) had bacterial vaginosis, 5 (0.67%) had candidiasis and 8 (1.0%) had trichomoniasis (Table 4). In our study, the most frequent epithelial abnormality was ASCUS (3.0%) followed by HSIL (1.0%), LSIL (0.6%), SCC (0.4%) and the least common AGUS (0.2%). This data was compared with a study by Agrawal<sup>[10]</sup> which however showed maximum cases of LSIL. This can be due to geographical variation of the study population (Table 5). The most common age group showing epithelial cell abnormality was above 40 years of age. Most cases of ASCUS were in the age range of 41-50 years. LSIL was seen in the age group of 40 to 70 years and SCC was seen in those above 60 years of age. In our study, LSIL was common among women after 40 years of age similar to the study of Agrawal<sup>[10]</sup>. HSIL was most common among women for more than 30 years. In the age group of 21-30 years, the majority of PAP smears showed no epithelial cell abnormality. The findings of Agrawal<sup>[10]</sup> showed no abnormalities between 21-40 years of age. This shows that the prevalence of epithelial cell abnormalities increases with age. The limitations of this study are few but important. The use of liquid-based cytology methods may reduce the number of unsatisfactory smears but is not cost-effective in our setup. The sensitivity of the pap smear test could have been improved if co-testing had been done with HPV DNA and also with serial pap smears as per recommendations. All abnormal pap smears should be followed with colposcopy-guided biopsies.

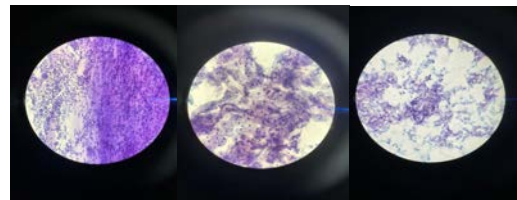


Fig 1: Microscopic Images of

A: Negative for Intra Epithelial Lesion or Malignancy

B: Trichomoniasis

C: Atypical Squamous Cell of Undetermined Significance

Table 1: Age-Wise Distribution of Study Population

Age (years)	No. of cases	Percentage
21-30	123	15.4
31-40	283	35.4
41-50	288	36.0
51-60	63	7.8
61-70	30	3.8
71-80	13	1.6
Total	800	100

Table 2: Presenting Complaints of the Study Population

Symptoms	No. of cases	Percentage
Vaginal discharge	586	73.2
Menstrual abnormality	114	14.2
Something coming out of the vagina	70	8.8
Post-coital bleeding	30	3.8
Total	800	100

Table 3: Category-Wise Distribution of Pap Smear Diagnosis

General categorization	Impression	Number of cases	Percentage
Unsatisfactory NILM		75	9.4
		683	85.4
	Inflammation	605	75.6
	Bacterial vaginosis	60	7.6
	Candidiasis	05	0.6
Epithelial cell abnormality	Trichomoniasis	08	1.0
	Atrophic	05	0.6
		42	5.2
	ASCUS	24	3.0
	LSIL	05	0.6
	HSIL	08	1.0
	SCC	03	0.4
	AGUS	02	0.2

Table 4: Cervical Epithelial Abnormalities in Relation to Age of the Study Population

Age group (years)	ASCUS (%)	LSIL (%)	HSIL (%)	SCC (%)	AGUS (%)	Percentage
21-30	0	0	2	0	0	3.84
31-40	2	0	3	1	0	15.40
41-50	11	2	1	0	2	38.46
51-60	5	1	2	2	0	23.07
61-70	6	2	0	0	0	19.23
71-80	0	0	0	0	0	0.00
Total	24 (57.69%)	5(11.53%)	8 (19.23%)	3 (7.69%)	2 (3.84%)	42 (100%)

Table 5: Studies Comparing the Prevalence of Epithelial Abnormalities

Author	YEAR	PLACE	No. Of Cases	Prevalence (%)	ASCUS (%)	LSIL (%)	HSIL(%)	SCC(%)	AGUS(%)
Jadav <sup>[13]</sup>	2019	Gujarat	487	1.22	0.2	0.2	0.41	0.41	-
Joshi <sup>[11]</sup>	2021	Pune	9900	2.82	1.5	0.7	0.6	0.04	0.1
Agrawal <sup>[10]</sup>	2023	Maharashtra	240	5.83	2.17	2.60	0.86	0.43	-
Present study	2023	Rajasthan	800	4.2	2.4	0.5	0.8	0.3	0.2

## CONCLUSION

Pap Smear test is a simple, inexpensive, non-invasive and an OPD performed to detect various premalignant and malignant lesions of the cervix. Our study on Pap smear was able to classify most inflammatory and malignant lesions and has shown the importance of Pap smear test in screening cervical cancer. By conducting health camps, increasing awareness programs and performing Pap smears, the incidence of cervical cancer can be greatly reduced. Tracking progress and providing timely evidence is a fundamental step forward for countries to remain aligned with the targets set by WHO to eliminate cervical cancer as a public health problem (ie, to reduce the incidence of the disease below a threshold of 4 cases per 100000 women-years).

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