Print ISSN: 2321-6379
Online ISSN: 2321-595X

Original Article

# Detection of Abnormal Cervical Cytology by Papanicolaou Smears at Tertiary Care Hospital - Rajkot, Gujarat, India

**Milan B. Purohit[1], Nayana H. Bhalodiya[2], Rushang Dave[3], Riddhi Parmar[3], Ravi Kothari[4], Gauravi Dhruva[5]**

[1]Associate Professor, Department of Pathology, P.D.U. Medical College, Rajkot, Gujarat, India, [2]Senior Resident, Department of Pathology, P.D.U. Medical College, Rajkot, Gujarat, India, [3]Senior Resident, Department of Pathology, AIIMS, Rajkot, Gujarat, India, [4]Senior Resident, Department of Pathology, P.D.U. Medical College, Rajkot, Gujarat, India, [5]Professor and Head, Department of Pathology, P.D.U. Medical College, Rajkot, Gujarat, India

## Abstract

**Introduction:** In developing countries like India, the burden of cervical cancer is still high. According to the World Cancer statistics, >80% of all the cervical cancer cases are found in developing and low-resource countries, because of a lack of awareness. Pap test not only diagnose cervical cancers but also aids in the diagnosis of inflammatory conditions and helps in treatment.

**Material and Methods:** This is a retrospective study carried out at P.D.U. Medical College and Hospital, Rajkot, Gujarat during January 2021–December 2021. Total of 782 pap smears are included in the study. Both endocervix and ectocervix were sampled. Immediately slides were fixed in 95% ethyl alcohol and subsequently stained by PAP and Hand E stains. Stained slides are mounted with DPX and reported by pathologist according to Bethesda system.

**Result:** A total of 782 pap smears are included in the study. Out of which, 198 smears were found to have pathology accounting for 78.5%. One hundred and seventy-one smears were found to be inflammatory accounting for 21.87%. Atypical squamous cells of undetermined significance, low-grade squamous intraepithelial lesion, and high-grade squamous intraepithelial lesion were 0.64%, 1.28%, and 1.02%, respectively. About 0.51% cases were of squamous cell carcinoma.

**Conclusion:** We can conclude Pap test is a simple and cost-effective tool in the diagnosis of inflammatory, premalignant, and malignant lesions of cervix. Awareness and screening have to be done effectively which helps in detection of premalignant lesions and reduce the incidence of cervical cancer.

**Key words:** Bethesda system, Cervical cancer, PAP test

## INTRODUCTION

In developing countries like India, the burden of cervical cancer is still high. According to the World Cancer statistics, >80% of all the cervical cancer cases are found in developing and low-resource countries, because of a lack of awareness.[1] Every year, 122,844 women in India are diagnosed with cervical cancer, and 67,477 women die from the diseases.[2] Pap test is a simple and cost-effective test. Pap smear involves collection of exfoliated cells from the cervix onto glass slides which are processed in the laboratory and examined for the presence of cervical premalignant cells. HPV is sexually transmitted oncogenenic virus and plays a key role in development of cancer.[3,4] The introduction of cytological screening by George Papanicolaou in the late 1940s was a great public health success story in cervical cancer prevention.[5] Apart from diagnosing cervical cancers pap test also aids in the diagnosis of inflammatory conditions. Cervical cancer is a preventable disease. Annual screening is recommended from the age of 25 years till three consecutive negative results before lengthening the screening interval depending n the risk group of the woman. The US Preventive Services Task Force and the American Cancer Society now recommends cytological screening every 3 years starting

Access this article online

www.ijss-sn.com

Month of Submission : 06-2022
Month of Peer Review : 07-2022
Month of Acceptance : 08-2022
Month of Publishing : 08-2022

**Corresponding Author:** Ravi Kothari, A-533, PG Hostel, Near RUDA Building, Jamnagar Road, Rajkot - 360 001, Gujarat, India.

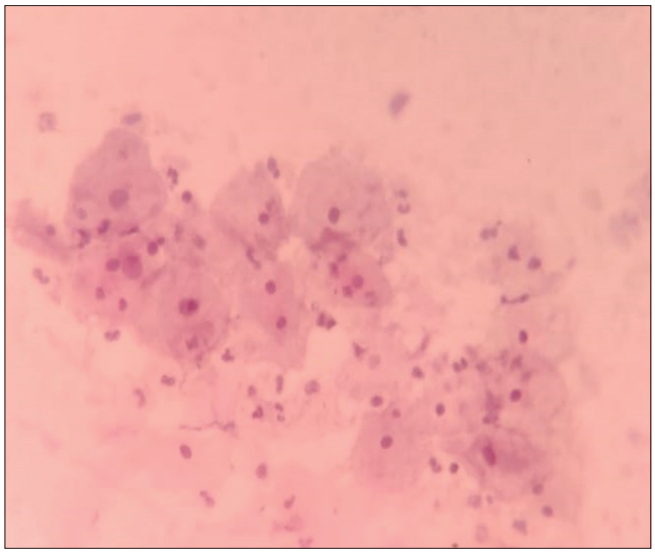

**Figure 1: Clue cells in bacterial vaginosis (H and E, ×40)**

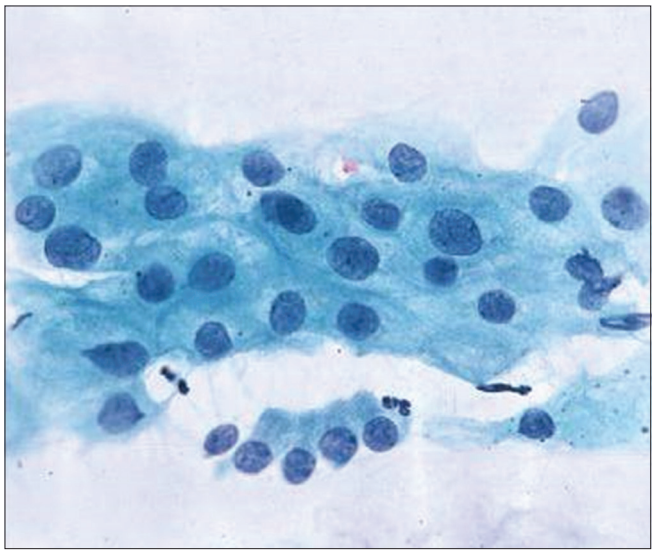

**Figure 2: Atypical squamous cells of undetermined significance (pap, ×40)**

from age 21 but not lower.[6,7] According to National Cancer Registry, cancers of uterine cervix and breast are leading malignancies seen in Indian women.[8] Sensitivity and specificity of pap smear screening are 50–75% and 90–99%, respectively.[9] If precancerous stages are identified early and treated it is a preventable disease.[10]

## MATERIALS AND METHODS

This is a retrospective study carried out at P.D.U. Medical College and hospital, Rajkot, Gujarat during January 2021–December 2021. Total of 782 pap smears are included in the study. Smears are taken by a medical professional using modified ayers spatula which was inserted and rotated over 360 degrees. Both endocervix and ectocervix were

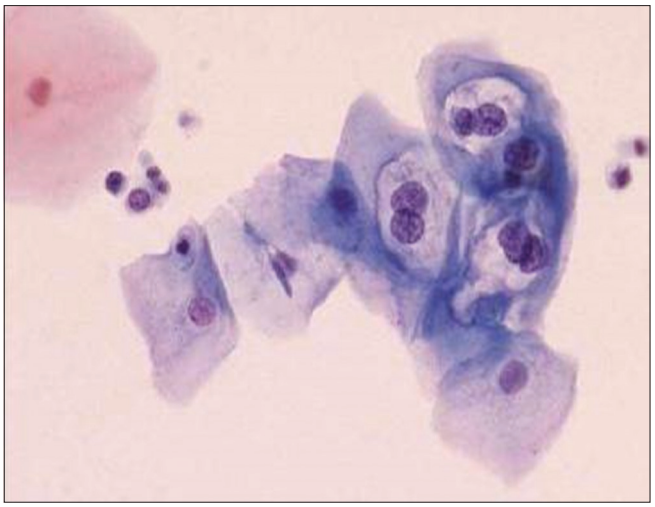

**Figure 3: Low-grade squamous intraepithelial lesion (pap, ×40)**

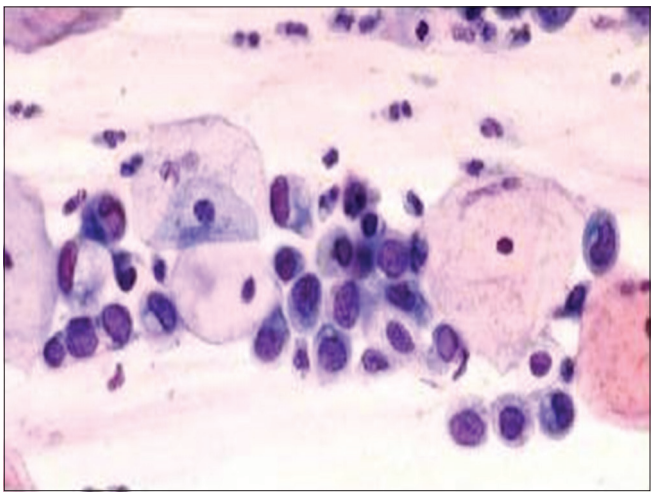

**Figure 4: High-grade squamous intraepithelial lesion (pap, ×40)**

sampled. Immediately slides were fixed in 95% ethyl alcohol and subsequently stained by PAP and H and E stains. PAS stain is used for fungal confirmation stained slides are mounted with DPX and reported by pathologist according to Bethesda system.

## OBSERVATIONS AND RESULTS

A total of 782 pap smears are included in the study. Out of which, 80 smears were found to be unsatisfactory accounting for 10.23%. Five hundred and four smears were found to be normal on screening. Pattern of distribution of pap smear is shown in Table 1. Out of 782 pap smears, 198' smears were found to have pathology accounting for 78.5%., 171 smears were found to be inflammatory accounting for 21.87%. Atypical squamous cells of undetermined significance (ASCUS), low-grade squamous intraepithelial lesion (LSIL), and high-grade squamous intraepithelial lesion (HSIL) were accounting for 0.64%,

**Table 1: Number of cases according to Bethesda system**

| Result | Cases | Percentage |
|---|---|---|
| Unsatisfactory | 80 | 10.23 |
| NILM | 504 | 64.45 |
| Inflammatory | 171 | 21.87 |
| ASCUS | 5 | 0.64 |
| LSIL | 10 | 1.28 |
| HSIL | 8 | 1.02 |
| SCC | 4 | 0.51 |
| Total | 782 | 100 |

NILM: Negative for intraepithelial lesions or malignancy, ASCUS: Atypical squamous cells of undetermined significance, LSIL: Low-grade squamous intraepithelial lesion, HSIL: High-grade squamous intraepithelial lesion, SCC: Squamous cell carcinoma

**Table 2: Clinical presentations**

| Symptoms | No. of cases (N=504) |
|---|---|
| Leucorrhea | 243 |
| Low backache | 309 |
| Pain in abdomen | 289 |
| Irregular P/V bleeding | 114 |
| Itching at vulva | 167 |
| Something coming out of vagina | 26 |
| Dyspareunia | 56 |
| Dysmenorrhea | 89 |
| Burning and frequency of micturition | 121 |

1.28%, and 1.02%, respectively. Four cases of squamous cell carcinoma were found accounting for 0.51% of total cases.

Many of the patients had more than one symptom. Among them, 243 patients had complaints of leucorrhoea, 309 low backache, and 289 pain in abdomen, 114 irregular bleeding and 56 dyspareunia as per Table 2 Abnormal pap smears are shown in Table 3. In our study, the youngest women was 22 years and the oldest women was 70 years. All the pap smears reported in the age group of 22–40 were inflammatory. ASCUS and LSIL were mostly seen in the age group of 51–60. Total eight HSIL were reported and majority are seen in age group of 51–70 years. The Most common age group of squamous cell carcinoma was 51–70 years.

## DISCUSSION

The cervix is the lower part of the uterine cavity and is covered with two types of cells: The glandular and the squamous cells. The junction of these two types of cells is known as the transformation zone. Most cervical cancer originates from the transformation zone. Squamous cell carcinoma (95%) and adenocarcinoma (5%) are the two major histological types of an epithelial tumor of the cervix, but in rare cases, the tumor can also be of a non-squamous variant including adenosquamous

**Table 3: Distribution of abnormal sample age-wise age group (years)**

| Age group (years) | NILM | Inflammatory | ASCUS | LSIL | HSIL | SCC |
|---|---|---|---|---|---|---|
| 22–30 | 172 | 68 | 00 | 00 | 00 | 00 |
| 31–40 | 155 | 52 | 00 | 00 | 00 | 00 |
| 41–50 | 105 | 29 | 01 | 02 | 01 | 00 |
| 51–60 | 52 | 14 | 03 | 05 | 05 | 02 |
| 61–70 | 20 | 8 | 01 | 04 | 02 | 02 |
| Total | 504 | 171 | 05 | 10 | 08 | 04 |

NILM: Negative for intraepithelial lesions or malignancy, ASCUS: Atypical squamous cells of undetermined significance, LSIL: Low-grade squamous intraepithelial lesion, HSIL: High-grade squamous intraepithelial lesion, SCC: Squamous cell carcinoma

**Table 4: Comparison of study**

| Result | Verma *et al.* | Divya *et al.* | Present study |
|---|---|---|---|
| NILM | 19 (15.20) | 160 (17.9) | 504 (64.45) |
| Inflammatory | 86 (68.80) | 396 (56.4) | 171 (21.27) |
| ASCUS | 5 (4) | 84 (11.95) | 5 (0.64) |
| LSIL | 7 (5.6) | 00 (00) | 10 (1.28) |
| HSIL | 00 (00) | 17 (2.4) | 8 (1.02) |
| SCC | 1 (0.8) | 00 (00) | 4 (0.51) |

NILM: Negative for intraepithelial lesions or malignancy, ASCUS: Atypical squamous cells of undetermined significance, LSIL: Low-grade squamous intraepithelial lesion, HSIL: High-grade squamous intraepithelial lesion, SCC: Squamous cell carcinoma

carcinoma, neuroendocrine carcinoma, and glassy cell carcinoma.[11]

Screening strategies for cervical cancer include Pap smear testing alone, primary HPV testing alone, or contesting (with Pap and HPV testing). For patients under 21, screening is not required regardless of the age of initiation of sexual activity. In patients between 21 and 29, screening is initiated at age 21 with cervical cytology every 3 years. For patients aged 30–65, either Pap testing alone every 3 years or contesting (PAP and HPV testing combined) every 5 years is recommended. For patients who are above 65, the decision to continue screening depends on whether the patient has had an adequate prior screening, life expectancy, and preferences in a shared decision-making discussion. Symptomatic patients should have Pap smear testing as part of a diagnostic workup, regardless of prior screening results.[12]

Many studies have shown cervical screening by pap smear is the best technique to diagnose premalignant and malignancies of cervix. With regular follow-up and management, the incidence and mortality due to cervical cancer have reduced.

We compare our result with Verma *et al.*[13] and Divya *et al.*[14] In both study, inflammatory cases were leading while our study shows normal smear in lead.

Negative for intraepithelial lesion or malignancy category analyzed further and showed majority (91.55%) of

non-specific inflammation. There is a high incidence of Trichomonas and Candida were noted. Patients first visited them for main complaints of leucorrhoea rather than to go for specific screening in hospital. Figure 1 showing clue cells suggesting bacterial vaginosis they get easily treated with radical use of metronidazole and anti-fungal drugs.

Our study shows 0.64% cases of ASCUS, while Verma *et al.* and Divya *et al.* show 4% and 11.95%. In 2019, Guidelines allows patients with HPV + ASC-US or LSIL at their 1-year follow-up visit after colposcopic biopsy showing normal or low-grade histology to return for repeat HPV-based testing in 1 more year, rather than immediately return to colposcopy. Figure 2 showing cytomorphology of ASCUS main goal is treat women with high risk of developing invasive disease and observe women who are not at high risk of developing invasive disease and protect them from over-treatment. Our study shows eight cases of LSIL that is 1.02% while Verma *et al.* were having 5.6%. Figure 3 showing cytomorphology of LSIL observation is preferred for LSIL. Our study shows 1.02% HSIL while Divya *et al.* were having 2.4% of HSIL cases as per Table 4. Figure 4 showing cytomorphology of HSIL colposcopic biopsy is suggested according to the guidelines.

Our study shows four cases of squamous cell carcinoma that is of 0.51% while Verma *et al.* were having one case that is of 0.8%.[13,14] Cervical cancer commonly develops in women between the ages of 40–50 years and its precursor lesion usually occurs 5–10 years earlier. Therefore, it is recommended that women should have at least one Pap smear test before the age of 45 years.[15]

## CONCLUSION

Pap test is a simple and cost-effective tool in the diagnosis of inflammatory, premalignant and malignant lesions of cervix. Women above the age of 30 years are recommended for regular cervical screening every year and women with epithelial abnormalities are advised for close follow-up and colposcopic biopsies. Awareness and screening programs have to be to be done effectively which helps in detection of premalignant lesions and reduce the incidence of cervical cancer.

## REFERENCES


1. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, *et al*. Cancer incidence and mortality worldwide: Sources, methods and major patterns in globocan 2012. Int J Cancer 2015;136:E359-86.
2. Sreedevi A, Javed R, Dinesh A. Epidemiology of cervical cancer with special focus on India. Int J Womens Health 2015;7:405-14.
3. Gillet E, Meys JF, Verstraelen H, Bosire C, Sutter PD, Temmerman M, *et al*. Bacterial vaginosis is associated with uterine cervical human papillomavirus infection: A meta-analysis. BMC Infect Dis 2011;11:10.
4. Barry MJ, Caughey AB, Davidson KW, Doubeni CA, Epling JW Jr., Kemper AR, *et al*. Screening for cervical cancer: US preventive services task force recommendation statement. JAMA 2018;320:674-86.
5. Drew PA, Wilkinson EJ. Conventional cytology. In: Apgar BS, Brotzman GL, Spitzer M, editors. Colposcopy Principles and Practice, an Integrated Textbook and Atlas. Philadelphia PA: Saunders, Elsevier; 2008. p. 59-5.
6. Herbert A, Smith JA. Cervical intraepithelial neoplasia grade III (CIN III) and invasive cervical carcinoma: The yawning gap revisited and the treatment of risk. Cytopathology 1999;10:161-70.
7. American Cancer Society. New Screening Guidelines for Cervical Cancer. American Cancer Society; 2019. Available from: https://www.cancer.gov/news-events/cancer-currents-blog/2020/cervical-cancer-screening-hpv-test-guideline#:~:text=ACS%20recommends%20cervical%20cancer%20screening,Pap%20test%20every%203%20years
8. National Cancer Registry Program. Annual Report. New Delhi: National Cancer Registry Program; 1990-1996.
9. Tailor HJ, Patel RD, Patel PR, Bhagat VM. Study of cervical pap smears in a tertiary care hospital of South Gujarat, India. Int J Res Med Sci 2016;4:286-8.
10. Akshatha C, Arul P, Shetty S. Prevalence and comparison of cervical cytology abnormalities in postmenopausal and elderly women: A experience from tertiary care hospital. J Med Soc 2017;31:23-7.
11. Bava SV, Thulasidasan AK, Sreekanth CN, Anto RJ. Cervical cancer: A comprehensive approach towards extermination. Ann Med 2016;48:149-61.
12. Fontham ET, Wolf AM, Church TR, Etzioni R, Flowers CR, Herzig A, *et al*. Cervical cancer screening for individuals at average risk: 2020 Guideline update from the American cancer society. CA Cancer J Clin 2020;70:321-46.
13. Verma I, Jain V, Kaur T. Application of Bethesda system for cervical cytology in unhealthy cervix. J Clin Diagn Res 2014;8:OC26-30.
14. Divya J, Subramanian V, Mahendranath P, Bai S. Pattern of cervical papsmear cytology-our experience. Indian J Pathol Oncol 2022;9:31-3.
15. Maleki A, Ahmadnia E, Avazeh A, Mazloomzadeh S, Molaei B, Jalilvand A. Prevalence of abnormal papanicolaou test results and related factors among women living in Zanjan, Iran. Asian Pac J Cancer Prev 2015;16:69359.


**How to cite this article:** Purohit MB, Bhalodiya NH, Dave R, Parmar R, Kothari R, Dhruva G. Detection of Abnormal Cervical Cytology by Papanicolaou Smears at Tertiary Care Hospital - Rajkot, Gujarat, India. Int J Sci Stud 2022;10(5):92-95.

**Source of Support:** Nil, **Conflicts of Interest:** None declared.