

Original Research Article

# Cytological Pattern of Pap Smears and Related Clinical Factors in Detection of Preinvasive and Invasive Lesions of Cervix Uteri - In A Tertiary Care Centre of North East India

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## Abstract

**Background:** Carcinoma cervix is a leading cause of death among women in developing countries and it is increasing day by day. Pap smear test has been regarded as the gold standard for detection of preinvasive and invasive lesion of uterine cervix. The objective of this study was to evaluate the cytological pattern of various preinvasive and invasive lesions as well as non-neoplastic lesions of uterine cervix using Pap smear test.

**Materials and methods:** The study included 487 women in the 21-80 years attending gynecological OPD. Pap smear test had been done in all cases.

**Results:** Out of 487 cases, majority of cases were benign comprising of NLIM (negative for intraepithelial lesions or malignancy (58.52%) followed by inflammatory lesions (29.36%). Among epithelial cells abnormalities, most common finding was ASCUS (atypical squamous cell of undetermined significance, 4.51%), followed by HSIL (high grade squamous intraepithelial lesions, 3.69%) and LSIL (low grade squamous intraepithelial lesions, 2.46%). 0.41% cases were detected as SCC (squamous cell carcinoma). Preinvasive lesions were common in 40-50 years age group and invasive lesions occur one decade later.

**Conclusion:** Pap smear is a simple easy cost effective OPD procedure for early detection of pre-invasive and invasive lesions of carcinoma cervix.

## Key words

Cytology, PAP smear Cervix, Preinvasive, Invasive.

## Introduction

Worldwide cervical cancer is one of the major health problem and cause of mortality in women [1]. Cervical cancer is the fourth leading cause of cancer death in women worldwide. In India, it is the second most common cancer in women. Every year 122844 women in India are diagnosed with cervical cancer and 67,477 women die from the disease [2]. It is increasing day by day, because of lack of awareness and ignorance about the risk factors among people and ineffective or less number of screening program [1]. Though cervical cancer is a leading cause of death in women it is preventable disease and early detection through screening program and appropriate treatment can reduce the burden and save many lives [3].

The Pap test was introduced in 1941 by Dr. G. Papanicolaou for screening of malignant and premalignant lesions and is being used globally. It is the diagnostic tool which can detect early epithelial cells abnormalities and early stage of invasive cancer [1]. Sensitivity of Pap test is 50-80% and specificity 98-99%. It is simple cost effective easy routine OPD procedure and a large population can be screened [4].

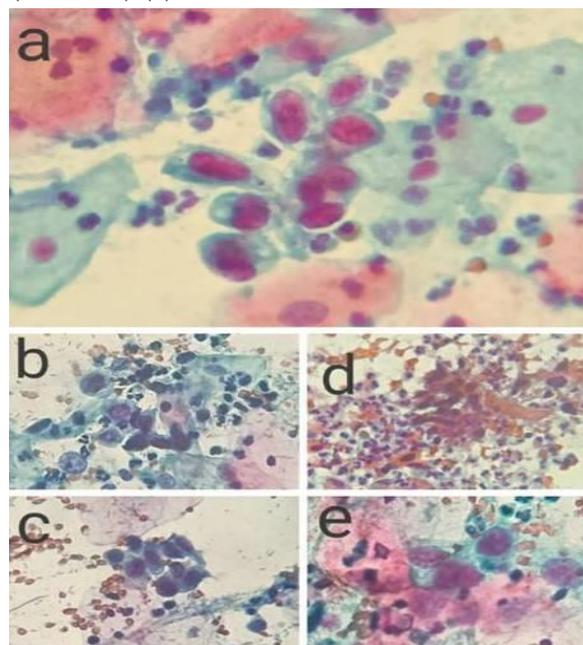
However Pap test has some limitations. Combined approach of HPV (Human papilloma virus) DNA and Pap test can improve the sensitivity in all categories of epithelial abnormalities. Because of wide spread screening program there has been significant reduction of mortality from cervical cancer in developed countries [4].

The aim of our study was to detect premalignant and malignant lesions of cervix uteri and find out the etiological factors in north east India and educate the women population regarding risk factors and motivate them to visit the hospital.

## Materials and methods

This was a cross sectional study conducted in a tertiary care centre of north eastern region of India for a period of one year. All total 487 women in the age group 20-75 years, symptomatic or asymptomatic participated in the study. Women with active vaginal bleeding with growth, clinically diagnosed case of carcinoma cervix, had undergone treatment were excluded from the study. The patients underwent prior gynecological examination before taking the samples. The samples were taken with the help of Ayer spatula from the transformation zone and smears were made on glass slides and fixed in absolute alcohol immediately. After proper fixation slides were stained with Pap stain. Cytological reporting was done using Bethesda system. The system broadly divides the lesions into those negative for intraepithelial malignancy and epithelial cell abnormalities that includes squamous cell and glandular cell abnormalities (**Figure – 1**).

**Figure – 1:** Low grade squamous intraepithelial lesion (LSIL) (a). High grade squamous intraepithelial lesion (HGSIL) (b and c). Squamous cell carcinoma (SCC) (d). Atypical squamous cell of undetermined significance (ASC-US) (e).



All the patients with abnormal results detected in Pap smears were asked to attend gynecological OPD for follow up and treatment as per the standard guideline by WHO.

## Results

In this study, out of 487 cases, 24.85% (121) were below 30 years and 366 (75.15%) were above 30 years. The highest number of patients 38.39% (187) were from 31-40 year age group and the lowest number 1(0.21%) of patients from 71-80 year age group.

Out of 487 patients, most of the patients were from Hindu community 338(69.4%). Islam community constituted 28.9% (141), 1.2% (06) were Christian and 0.4% (02) from Sikh community.

Most common clinical symptom was leucorrhoea 47.02% (229) followed by blood stained discharged 25.66% (125), menstrual disorder 10.6% (52), post-menopausal bleeding 7.18% (35), pain abdomen 3.62% (18), uterine prolapsed 0.82% (04). However, there were 4.9% (24) asymptomatic women.

Most common findings on speculum examination was white discharge per vaginum 50.51% (246) followed by cervical erosion 30.39% (148) and rest were healthy looking cervix 19.09% (93).

### Cytological evaluation

Out of 487 cases, 9.85% (48) samples were unsatisfactory for evaluation. These subjects were screened again and Pap test was repeated. In this study, we got 29.36% (143) NLIM (negative for intraepithelial lesion or malignancy) comprising of trichomonus vaginalis, fungal organisms, bacterial vaginosis, herpes simplex virus infection; 58.52% (285) were reactive cellular changes associated with inflammation, repair, effect of mechanical device and atrophy. In epithelial cell abnormalities, we had 4.51% (22) ASCUS (atypical squamous cell of undetermined significance); 2.4% (12) LSIL (low grade squamous intraepithelial lesion);

3.69% (18) HSIL (high grade squamous intraepithelial lesion); 1% (05) ASC-H (atypical squamous cell cannot exclude HSIL). Only two cases 0.4% were detected as squamous cell carcinoma.

Non neoplastic findings especially inflammatory findings are common in 31-40 years age group followed by 21-30 years age group. However epithelial cell abnormalities are more common in 41- 50 years age group. Most common epithelial abnormalities was ASCUS (4.51%) followed by HSIL, LSIL and ASC-H, squamous cell carcinoma. While comparing clinical symptoms and cytological findings inflammatory lesions are commonly associated with leucorrhoea and epithelial abnormalities are associated with blood stain discharge and post-menopausal bleeding. Intraepithelial abnormalities are comparatively less in case of clinically healthy cervix but it is common in patients with cervicitis and cervical erosion (**Table – 1, 2, 3**).

## Discussion

During the last decade there has been increase in cervical carcinoma worldwide. Carcinoma cervix follows a series of initial epithelial abnormalities for a considerable period of time by detection of which the disease can be diagnosed in its earliest form resulting in reduction of mortality as well as morbidity to some extent.

Increasing incidence of carcinoma cervix is mostly due to lack of proper screening program in many part of India. Screening program using Pap test can detect carcinoma cervix in an effective way to prevent development of the disease. According to American cancer society the Pap smear test is a routine cancer screening method that should be done every 3 year and a Pap smear with a HPV DNA test is recommended as a screening method every 5 years [5].

In our study, we reported 9.85% unsatisfactory smears. Other studies reported 6.42% and 4.8% [1, 6] of unsatisfactory smears. Disparity may be

due to more technical error and improper staining. Proper training of technician can improve the gap. We got 47.02% of leucorrhoea cases which was the most common complaint in our study followed by blood stained discharge (BSD) and post-menopausal bleeding (PMB). Sachan PL, et al. reported 36.96% of leucorrhoea

[1]. Our finding was little bit high, may be because of large numbers sample in their study. In our study, most common sign was white discharge per vaginum (cervicitis), 50.51% whereas Sachan PL, et al. reported 29.69% cases of white discharge per vaginum [1].

**Table - 1:** Numbers of cases in different cytological category.

| Age (Years) | NLIM           | Inflammatory    | ASCUS         | ASCU-H       | LSIL         | HSIL          | SCC          | Total No. of cases |
|-------------|----------------|-----------------|---------------|--------------|--------------|---------------|--------------|--------------------|
| 20-30       | 20             | 100             | 00            | 00           | 01           | 00            | 00           | 121(24.84%)        |
| 31-40       | 65             | 114             | 03            | 00           | 02           | 03            | 00           | 187(38.39%)        |
| 41-50       | 39             | 49              | 12            | 03           | 06           | 10            | 02           | 119(24.43%)        |
| 51-60       | 06             | 14              | 06            | 02           | 02           | 04            | 00           | 36(7.39%)          |
| 61-70       | 12             | 08              | 01            | 00           | 01           | 01            | 00           | 23(4.72%)          |
| 71-80       | 01             | 00              | 00            | 00           | 00           | 00            | 00           | 01(0.20%)          |
| Total       | 143<br>(29.36) | 285<br>(58.52%) | 22<br>(4.51%) | 05<br>(1.0%) | 12<br>(2.4%) | 18<br>(6.16%) | 02<br>(0.4%) | 487(100%)          |

**Table - 2:** Relationship of cytological findings and symptoms.

| Symptoms              | Inflammatory    | NLIM            | ASCUS         | ASCUS-H      | LSIL          | HSIL          | SCC           | Total No. of cases |
|-----------------------|-----------------|-----------------|---------------|--------------|---------------|---------------|---------------|--------------------|
| Leucorrhoea           | 173             | 46              | 04            | 02           | 02            | 02            | 00            | 229(47.02%)        |
| Blood stain discharge | 55              | 43              | 12            | 01           | 05            | 08            | 01            | 125(25.66%)        |
| PMB                   | 08              | 06              | 06            | 02           | 04            | 08            | 01            | 35(7.18%)          |
| M. disorder           | 11              | 41              | 00            | 00           | 00            | 00            | 00            | 52(10.67%)         |
| Pain abdomen          | 15              | 03              | 00            | 00           | 00            | 00            | 00            | 18(3.69%)          |
| Prolapse              | 03              | 01              | 00            | 00           | 00            | 00            | 00            | 04(0.82%)          |
| Asymptomatic          | 20              | 03              | 00            | 00           | 01            | 00            | 00            | 24(4.92%)          |
| Total                 | 285<br>(58.52%) | 143<br>(29.36%) | 22<br>(4.51%) | 05<br>(1.0%) | 12<br>(2.46%) | 18<br>(3.69%) | 02<br>(0.41%) | 487(100%)          |

**Table - 3:** Relationship of cytological findings and gross appearance of cervix.

| Clinical appearance of cervix | Inflammatory    | NLIM            | ASCUS         | ASCUS-H      | LSIL          | HSIL          | SCC          | Total           |
|-------------------------------|-----------------|-----------------|---------------|--------------|---------------|---------------|--------------|-----------------|
| Healthy                       | 41              | 48              | 01            | 00           | 03            | 00            | 00           | 93<br>(19.09%)  |
| White discharge per vaginum   | 147             | 75              | 11            | 00           | 06            | 07            | 00           | 246<br>(50.51%) |
| Cervical erosion              | 97              | 20              | 10            | 05           | 03            | 11            | 02           | 148<br>(30.39%) |
| Total                         | 285<br>(58.52%) | 143<br>(29.36%) | 22<br>(4.51%) | 05<br>(1.0%) | 12<br>(2.46%) | 18<br>(3.69%) | 02<br>(0.4%) | 487<br>(100%)   |

In this study, we got 29.36% of inflammatory smears and 58.52% smears were reported as NLIM. Other authors [7, 8] reported 42.66%, 95% and 74.5% of inflammatory smears. Sachan, et al. reported 48.84% of cases as NLIM. Both inflammatory lesions and NLIM are common in the 31-40 years of age group which is similar to other study [1]. All cases reported as of inflammatory and NLIM were advised for a course of antibiotic and follow up. Since most of the cases of LSIL are preceded by inflammatory lesions, this will definitely reduce the chances of development of epithelial cells abnormalities.

In the present study most of the epithelial cell abnormalities were reported in 40 -50 years age group. Sachan PL, et al. reported maximum numbers of abnormal cytology in 40-60 years age group [1]. Gupta, et al. reported maximum numbers of abnormal epithelial cells abnormalities in 30-39 years of age group [9].

In the present study, 12.11% abnormal cytology were detected. Other studies reported 8.48%, 9.05%, 12.60%, 11.95% respectively [1, 10, 11, 12]. In the present study, most common epithelial cells abnormality was ASCUS followed by HSIL and LSIL. We reported 4.5% ASCUS, 1.0% ASCUS-H. Sachan PL, et al.; Saha, et al.; Verma, et al. and Padmini, et al. reported 2.9%, 5.92%, 1.0%, 8.0% of ASCUS respectively [1, 13, 14, 15].

We reported 2.4% LSIL, 6.16% HSIL and 0.4% SCC. Vaghela, et al. [6] reported 12% LSIL, 5% HSIL. Sachan PL, et al. reported 5.09% LSIL and 0.48% HSIL [1]. Padmini, et al. reported 5% LSIL and 3% HSIL [15]. Nayani and Hendre [16] reported 8.6% LSIL and 3.8% HSIL. Verma, et al. reported 5.5% LSIL and 2.5% HSIL [14].

Significant disparity observed while comparing the findings of present study with the studies done by other authors particularly in case of LSIL and HSIL. In the present study, HSIL are more than LSIL however, in other studies, LSIL are more than HSIL. It may be due to lack of

knowledge about the risk factors. When the patient realize about the disease it is already high grade. Again this might be because of lack of awareness about the disease, lack of education, negligence of female health in the family, low personal hygiene (low socioeconomic status), various cultural behaviour, geographical variation, etc. but most importantly, lack of proper screening program and awareness about the disease.

In the present study, we got 0.4% SCC and all the cases occur in 51-60 years age group i.e. one decade later than the age group (40-50 years) of occurrence of premalignant lesions. It indicates that proper screening and awareness program at both rural and urban area can significantly reduce the development of carcinoma cervix. Therefore all women above 30 years should participate in the cervical Pap smear screening program for prevention and detection of carcinoma cervix at an early stage.

## Conclusion

Pap smear test is a simple safe easy and economical OPD procedure to detect premalignant and malignant lesions of uterine cervix, however, more screening program are needed to detect the lesions in early stage and reduce the mortality and morbidity. More studies are needed on Pap smear combined with human papilloma virus DNA testing with large number of patients which will definitely help and will increase the sensitivity and specificity of detection of invasive and preinvasive cervical pathology. Awareness program is a must to fight against the disease.

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