# Pattern of Cervical Smear Cytology in Rural Medical College

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## Abstract

*The present study was undertaken with the aim to evaluate the abnormal cytological entities detected by cervical Pap smears among patients reporting to outdoor department of Pravara Rural Hospital Loni. The present study was carried out prospectively over a period of 2 years from October 2007 to May 2009. It included all new cases attending gynaecology department. Total 680 samples were included in the study period of which 625 smears were satisfactory (91.92%).*

**Key words:** *Cervical smear, cytology, ASCUS*

## Introduction

The earliest details of cervical cytology and biopsy were described in 19th century.[1] During this period biopsy of the cervix was used as a diagnostic tool.[2] The biopsy was undertaken to establish the nature of the lesion. It was soon realized that by this method only advanced disease could be detected.[2] So the search began for new diagnostic methods which would diagnose cervical lesions in early stages. Rubin in 1910 described structural changes in the epithelium at the periphery of invasive cancer which was considered as a manifestation of early cervical cancer.[3]

Since the introduction of the Pap smear by George Papanicolaou, cervical cytology has become the main diagnostic tool for detection of cervical cancer. Today cervical cytology is not only used for detection of overt cancer cells, but also for finding precursor lesions {cervical intraepithelial lesions grades I–III (CIN)} which has led to decrease in prevalence of cervical cancer in many countries.[4] The Bethesda system (TBS) for reporting cervical or vaginal cytological findings was introduced in 1988 and revised in 1991 to establish uniform terminology and standardize diagnostic reports.[5] TBS 2001 was developed through a process that involved committee review of the

literature, solicitation of expert opinions, and discussion of the proposed changes on an interactive web site.[6]

Due to easy availability, cost effectiveness and reliability, cervical smears became a valuable tool in screening and diagnosing various pathologies of the cervix even at peripheral level in rural place. The present study was undertaken with the aim to evaluate the abnormal cytological entities detected by cervical Pap smears among patients reporting to outdoor department of gynaecology Pravara Rural Hospital Loni.

## Material & Methods

The study was carried out prospectively over a period of 2 years from October 2007 to May 2009. It included all new cases attending gynaecology outdoor department of Pravara Rural Hospital Loni. The exclusion criteria used were unmarried females, cases where diagnosis were known, cases already undergoing treatment for any gynecological condition, cases undergoing chemotherapy or radiotherapy and all post-operative cases.

A detailed history was obtained with special reference to age, parity and complaints. The per speculum findings and vaginal findings were also noted. Cervical smear was obtained and stained by Papanicolaou technique. It was examined under microscope and findings were noted using the Bethesda system. In some cases, where indicated and feasible, subsequent

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cervical biopsy was undertaken, processed and stained by Haemotoxylin and Eosin stain, followed by microscopic examination. The findings of both cytology and histopathology were subsequently compared.

## Results

There were 680 smears screened during the study period. Out of these 625 smears were satisfactory (91.92%) for evaluation and were further evaluated. There were 562 (82.65%) patients from reproductive age group i.e. between 21 to 50 years. The cases below 20 years of age were only 2 (0.29%) and cases with age more than 50 years were 116 (17.06%). Maximum cases were in 31-40 age groups i.e. 250 (36.76%). Common symptoms in these patients were vaginal discharge in 238 cases (35%), pain abdomen in 227 (33.38%), menstrual irregularity in 115 (16.91%), per vaginal bleeding in 46 (6.77%), something coming out of vagina in 27 (3.97%) and infertility in 4 (0.59%) cases. Ninty one (13.38%) cases had no complains and were asymptomatic. On examination, cervical erosion was seen in 30.15%, polyp in 0.44% and no significant findings in 24.27% cases.

Out of 680 samples, 55 were unsatisfactory for reporting and were discarded. After microscopy, remaining samples (n = 625) were categorized into two groups as per Bethesada system of classification, NILM (Negative for Intraepithelial Lesion or Malignancy) with 509 (81.44%) samples and epithelial cell abnormality in 116 (18.56%) cases (Table 1).

**Table 1: Distribution of cases among adequate smears**

| S.No | Category | Number | Percentage |
|------|----------|--------|------------|
| 1 | NILM | 509 | 81.44 |
| 2 | Epithelial cell abnormality | 116 | 18.56 |
| | Total | 625 | 100 |

On further analysis, out of 509 samples reported as NILM, 86 (13.76%) samples were having no specific pathology. RCC (Reactive Cellular Changes) with inflammation was present in 176 (28.16%) samples (Fig1).
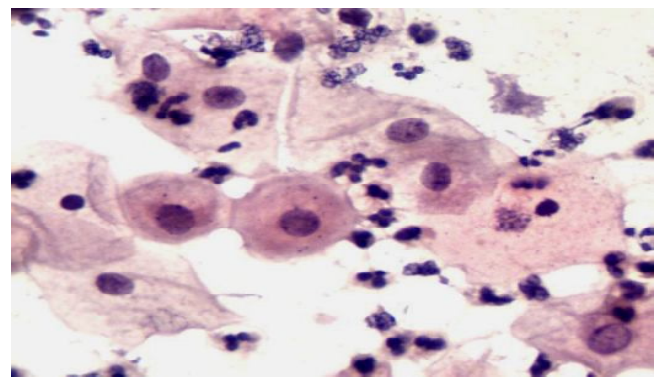


Fig 1: Photomicrograph of RCC showing nuclear enlargement with inflammatory cells (Pap stain, 40X)

Third group was of "Organism". In this group, Trichomonas vaginalis infestation was seen in 123 (19.68%) samples. Bacterial vaginosis was present in 102 (16.32%) samples. Only 15 (2.4%) samples had candida infection. Rest 7 (1.12%) samples were reported as atrophic (Table 2).

**Table 2: Analysis of samples reported as NILM (n =509)**

| Category | Cytodiagnosis | | Number | Percentage (of total satisfactory smear, n = 625) |
|----------|---------------|---|--------|--------------------------------------------------|
| 1 | No specific pathology | | 86 | 13.76 |
| 2 | RCC with inflammation | | 176 | 28.16 |
| 3 | Organism | Trichomonas | 123 | 19.68 |
| | | Bacterial vaginosis | 102 | 16.32 |
| | | Candida | 15 | 2.40 |
| 4 | Atrophic | | 7 | 1.12 |

There were 116 samples reported as having epithelial cell abnormality. Out of these samples, 31(4.96%) smears were ASCUS (Atypical Squamous Cells of Undetermined Significance, Fig 2), AGUS in 7 (1.12%0, (Low Grade Squamous Intraepithelial Lesion) in 46(7.36%), HSIL (High Grade Squamous Intraepithelial Lesion) in 22 (3.52%) and squamous cell carcinoma (SCC) in 10 (1.6%) samples (Table 3, Fig 3).
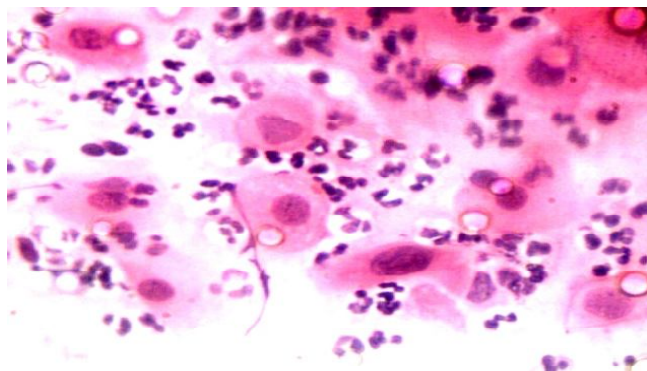


Fig 2: Photomicrograph of Atypical Squamous Cells of Undetermined Significance (ASCUS, Pap stain, 40X)
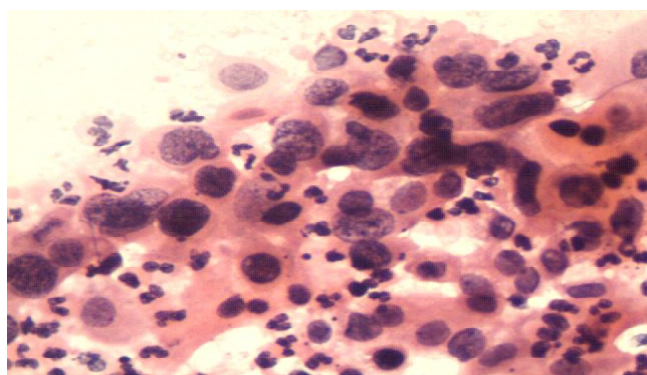


Fig 3: Photomicrograph of Squamous Cell Carcinoma (Pap Stain, 40X)

**Table 3: Analysis of samples reported as Epithelial cell abnormality (n =116)**

| Category | Cytodiagnosis : Epithelial cell abnormality | Number | Percentage (n = 625) |
|---|---|---|---|
| 1 | ASCUS | 31 | 4.96 |
| 2 | AGUS | 7 | 1.12 |
| 3 | LSIL | 46 | 7.36 |
| 4 | HSIL | 22 | 3.52 |
| 5 | SCC | 10 | 1.60 |

There were 101 cases in which subsequent biopsy was done and correlation between cytology & histopathology could be established including 12 smears which were reported as inadequate on cytology. In these 12 samples, on subsequent histopathology, 1 case (8.33%) was reported as "No specific pathology", 10 cases had inflammation (83.33%) and 1 case (8.33%) had squamous cell carcinoma.

There were 12 cases reported as having "No specific pathology" on cytology. On subsequent biopsy, 2 cases (16.66%) correlated well with cytological diagnosis. But rest 10 cases (83.33%) were diagnosed as inflammatory lesion.

Thirty nine cases were reported as inflammatory lesion on cytology. Out of these cases, 30 cases (76.92%) correlated well with histopathology. In 8 cases (20.51%) there was "No specific pathology" and 1 case (2.56%) had squamous cell carcinoma on histopathology.

There were 7 cases in which cytology reported ASCUS. Out of these cases, 5 (71.43%) had inflammatory changes, 1 (14.28%) had no specific pathology and 1 (14.28%) had squamous cell carcinoma on histopathology.

Two cases were reported as AGUS on cytology. Out of these two cases, 1 each (50%) were reported as having no specific pathology and squamous cell carcinoma respectively.

There were 6 cases of LSIL on cytology. Out of these 6 cases, 2 (33.33%) correlated well on histopathology and were reported as having CIN I. In 1 case (16.67%) had inflammatory changes and 3 (50.33%) had squamous cell carcinoma on subsequent histopathology.

There were 17 cases reported as HSIL on cytology. Out of these cases only 1 (5.88%) had CIN I on histopathology. In rest 16 (94.22%) cases had squamous cell carcinoma.

There were 6 cases in which cytology revealed squamous cell carcinoma. It correlated very well on hispathology, i.e. all 6 cases (100%) were having squamous cell carcinoma on histopathology too.

## Discussion

Pap smear is a relatively simple cost-effective screening test that is carried out in conjunction with gynecologic examination at the primary health care level to detect abnormalities that might lead to cervical cancer.

In the present prospective study 680 cases were studied with cervical smear after detailed history. Whenever available, histopathological examination with correlation to the cytological examination was done. The findings of the present study are recapitulated and compared with the results of other studies.

All smears were subjected to initial cytological examination. For all cases Bethesda format of reporting was followed. The specimen is labeled "Unsatisfactory for evaluation" if any of the following condition apply[7]:

- Lack of patient identification on the specimen and/ or requisition form.

- Scant epithelial component (well preserved and well visualized squamous epithelial cells covering less than 10% of the slide surface).

- Obscuring inflammation, blood, thick areas, poor fixation, air drying artifact, contamination etc. that precludes the interpretation of approximately 75% or more of epithelial cells.

The present study has 8.09% of unsatisfactory smears which was similar to the study by Misra et al.[8] In comparison Mulay K et al[9] had almost double number of unsatisfactory smear (15.6%) due to high number of samples (6010) with many wrong request forms leading to incorrect patient information in 14.85% cases.

Most common complaint in our study was white PV discharge (35%) similar to study by Sherwani et al[10] (42.5%). Though in a study by Bhatla et al[11], it was present in 80% cases due to more selective inclusion of patients with vaginal discharge. Desai M[12] showed PV discharge in 51.2% cases. Her study had 60.9% cases with poor genital hygiene.

In our study 13.76% cases had smears with no specific pathology. It was comparable to study by Mital K et al[13] Although other similar studies reported more higher number (37.5-56.8%).[9,8,12] Lower incidence in our study was probably due to lesser sample size (680) as

study was done on hospital patient rather than normal population.

The study showed 28.16% cases under "Reactive Cellular Changes with Inflammation (RCC)" category which was comparable with the study by Mulay K et al[9] and Mital K et al. They which showed RCC in 19.61% and 23.33% of cases respectively.

The present study had maximum number of cases from "Organism" group (38.4%). It was probably due to inclusion of hospital based cases from rural population with low socio-economic background. Desai M[12] also reported similar finding, having more number of cases in this group (25.6%). Present study had only 1.12% cases in "Atrophic" category which was comparable to study by Misra JS et al (0.5%).[8] But study by Mulay K et al[9] had high percentage of cases (16.5%). It may be due to inclusion of cases from higher age group, i.e. above 50 (33.46%).

"Atypical squamous cell of undetermined origin (ASCUS)" was seen in 4.96% which was comparable to figure shown by Deb P et al (3.7%).[13] "Atypical glandular cell of undetermined significance (AGUS) was present in 1.12% of cases in present study as compared to 1.23 & 0.31% shown by Deb P et al and Mulay K et al respectively.

Present study had maximum number of cases under "Low-grade squamous intraepithelial lesion (LSIL)" group (7.36%) which was comparable to figure shown by Misra JS et al (5.5%). Our study had 3.52% of cases under "High grade squamous intraepithelial lesion (HSIL)" category. Other similar studies showed its incidence as 1.6% or less with figure as low as 0.16% by Mulay et al. Lower figure shown by Mulay et al was due to inclusion of large number of cases (6,010) from normal population. Present study revealed 1.6% cases having squamous cell carcinoma. It was comparable to the study by Desai M (1.5%).[12]

In the present study there were 101 cases (16.16%) in which subsequent biopsies were done and were available for correlation including 12 cases in which initial smears were unsatisfactory for reporting probably due to error in sample collection. Out of these 12 cases, 1 case was later diagnosed as having squamous cell

carcinoma, thereby putting caution for this category under cytology.

Thirty nine cases were reported as inflammatory lesions on cytology, which correlated well on histopathology (83.34%). Out of 6 cases of LSIL on cytology only 2 (33.33%) correlated well on histopathology. In rest 4 cases, 1 (16.67%) had inflammatory changes and 3 samples had squamous cell carcinoma. There were 17 cases reported as HSIL on cytology. Out of these cases only 1 (5.88%) had CIN I on histopathology. In rest 16 (94.22%) cases had squamous cell carcinoma. Thus, these cases, HSIL in particular, needs to be evaluated by histopathology for further confirmation.

Cases of squamous cell carcinoma on cytology correlated very well with histopathology (100%). The discrepancy in few categories in correlation between cytology and histopathology may be attributed due to: i) Variation in methods of collection, ii) Difference in cytological expertise and iii) Scraping procedure may fail to reach lesions high in cervical canal.

## Conclusion

Cervical smear was able to differentiate inflammatory, benign, precursors and malignant cases except in epithelial cell abnormalities, particularly HSIL, where it is advisable to have biopsy. Cervical smear cytology has important role in screening for different type of cervical lesions. The detection rate can be further improved by incorporating newer methods like PapSpin.

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