



# Application of Bethesda system to study cytological pattern of cervical Papanicolaou smears in a tertiary care hospital

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## Abstract

**Background:** Cervical cancer is the second most common gynaecological malignancy in the world. It can be preventable and curable if detected at an early stage. Routine screening test like Pap can detect early changes in the cervical epithelial cells there by facilitating appropriate management of disease.

**Material and Methods:** This is a retrospective study conducted in Department of Pathology GMC Jammu over a period of 1 year from August 2021 to July 2022. All the cervical papsmears received in the Department of Pathology, GMC Jammu, in the study period were included (expect menstruating women, pregnant women and women who had undergone hysterectomy), and were interpreted according to the 2014 Bethesda system classification.

**Results:** A total of 500 cases were reported in the Cytology section of the Department of Pathology in the study period of one year. Majority of the cases were Negative for Intraepithelial lesions or malignancy (79.6%). Smears positive for intraepithelial lesions or malignancy were 7.6%. ASCUS and LSIL were more frequent in women belonging to the age group of 40-49 years, HSIL was more frequent in age more than 60 years. Squamous cell carcinoma and AGCUS were more frequent in age group of 50-59 years.

**Conclusion:** Cervical cytology is a simple and cost-effective method for early detection of intraepithelial lesions and malignancy especially in a developing country like India. Pap smear examination should be established as a routine diagnostic aid by creating awareness regarding its utility and importance amongst women by using various mass media communication platforms along with easy availability in all primary health centres and subdistrict hospitals.

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## Introduction

Cervical cancer is the second most common gynaecological malignancy in the world.<sup>1</sup> About 80% of cases occur in the developing countries like India, representing leading cause of cancer related death in women.<sup>2</sup>

In 1943 George Nicholas Papanicolaou introduced cervical cytology to the world. His

landmark publication "Diagnosis of uterine cancer by the vaginal smear" paved the way to diagnose uterine cervical lesion with the help of simple and effective method.<sup>3</sup> Pap smear quickly became the gold standard in screening for the cervical cancer and resulted in a significant decline in the incidence of cervical cancer.



In 1988 the current cytological terminology “The Bethesda System” was introduced by the work of expert panel to provide uniform system of terminology for reporting with clear guidelines for the management of these lesions.<sup>2</sup> The latest version has been done in 2014, this system has five components of a Pap smear report – specimen type, adequacy, general category, interpretation, and adjunctive testing.

**Material and Methods**

This is a retrospective study done in the Post graduate Department of Pathology, Government Medical college Jammu. The study duration was one year from August 2021 to July 2022.

A total of 500 cases were reported in the study period. The pap smears were received on clean glass slides, immersed in Coplin jars containing 95% ethanol which act as a fixative, from the Department of Obstetrics and Gynaecology GMC Jammu. The prepared smears were stained by Papanicolaou stain in the Cytology section of the Department of Pathology. After staining the slides were then mounted with DPX (Dibutyl phthalate xylene) and were examined independently by two pathologist and reported according to 2014 Bethesda System. Clinical details were noted from requisition form and patients file in case of indoor patients.

The squamous epithelial cell abnormalities have been categorized into atypical squamous cells (ASC) including ASC of undermined significance (ASC-US) and ASC cannot exclude high grade squamous intraepithelial lesions (ASC-H) and squamous intraepithelial lesion (SIL). SIL was again subdivided into low grade squamous intraepithelial lesion (LSIL) and high grade squamous intraepithelial lesion (HSIL). Frank invasive malignancy were termed as squamous cell carcinoma. Glandular cell abnormalities were further categorized into atypical endocervical cells not otherwise specified and atypical endometrial cell not otherwise specified.<sup>4</sup>

**Inclusion criteria**

All cervicovaginal pap smears received in the cytology section, Department of Pathology during the study period were included in the study.

**Exclusion criteria**

Pregnant women, menstruating women and women who had undergone hysterectomy were excluded from our study.

**Results**

Out of total 500 cases in the age group of 20 to 75 years, maximum cases were in age group 40-49 years. Second highest frequency was in age group between 30-39 years and least number of cases were seen among women > 60 years. Table 1.

TABLE 1: Age wise distribution of total number of patients.

Age in years	No. of patients	Percentage %
20-29	54	10.8
30-39	160	32.0
40-49	188	37.6
50 -59	56	11.2
60 or >	42	8.4

In our study 436 (87.2%) smears were satisfactory for evaluation according to Bethesda system. Out of which epithelial cell abnormality constitutes 7.6% and 398 (79.6 %) cases fell in the category of NILM. Table 2

Table 2: Findings of pap smear cytology

Diagnosis	No of cases	Percentage %
Unsatisfactory for evaluation	64	12.8
NILM	398	79.6
ASCUS	20	4.0



LSIL	11	2.2
HSIL	5	1.0
Squamous Cell Carcinoma	1	0.2
AGCUS	1	0.2
Adenocarcinoma	0	0

Table 3: Age wise abnormal findings

Age group in years	No. of cases	ASCUS	LSIL	HSIL	SCC	AGCUS	ADENO CARCINOMA	TOTAL ABN FINDINGS	%
20-29	54	2	1	0	0	0	0	3	0.6
30-39	160	5	1	1	0	0	0	7	1.4
40-49	188	9	5	1	0	0	0	15	3.0
50-59	56	3	2	1	1	1	0	8	1.6
60 or >	42	1	2	2	0	0	0	5	1
TOTAL	500	20	11	5	1	1	0	38	7.6

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Highest frequency of cervical abnormalities was seen in 40-49 years of age group particularly ASCUS (9 cases) and LSIL (5 cases) were seen more in this age group. HSIL were highest in age group above 60 years. Squamous cell carcinoma and AGCUS were found in age group 50-59 years. Table 3

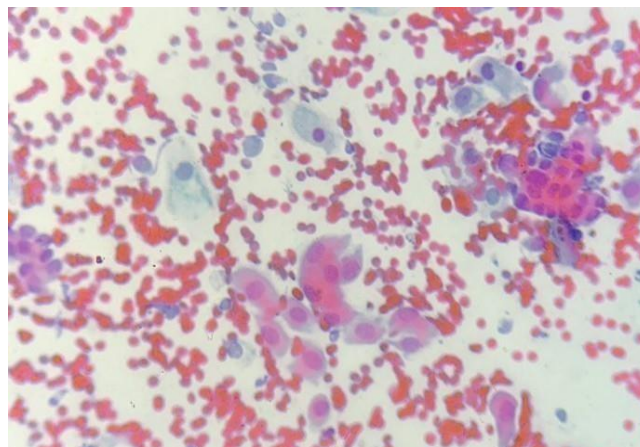


Figure1: LSIL, showing mature squamous cells with enlarged nuclei. In an inflammatory background(40x)



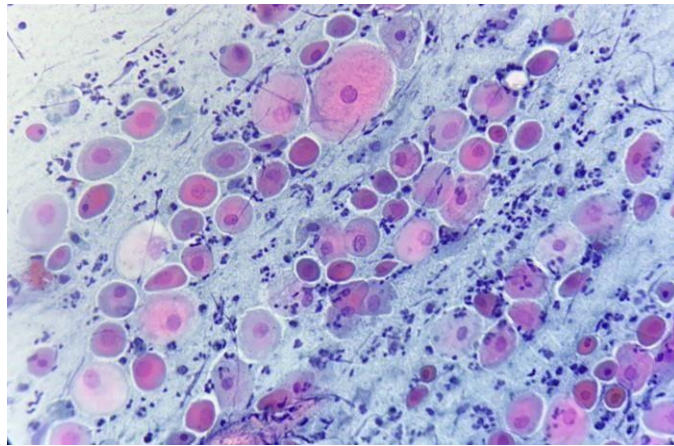


Figure 2: HSIL, showing syncytial cluster with cells of variable nuclear cytoplasmic ratio (40x)

### Discussion

Cervical cancer is the most important cancer in the world responsible for about 5 % of all deaths due to cancer in women.<sup>5,6</sup> Pap smear cytology has been the main stay for screening in past two decades and has led to substantial reduction in cancer rate. Since the Pap smear test is a simple, painless, quick and cost-effective procedure it has been a useful tool to identify and prevent precursor lesion progression to malignancy.

A total of 500 pap smears were analysed during the study period. A total of 436 (87.2%) smears were satisfactory for evaluation according to Bethesda system. Out of which epithelial cell abnormality constitute 7.6% NILM comprised of 79.6% of cases. The age of the patients ranged from 20 to 75 years, most cases were seen in age group 40-49 years (37.6%) followed by 30-39 years (32.0%). This is in accordance with the studies of Lahari et al<sup>5</sup>, and Mulay et al<sup>7</sup> who also reported 40-49 years as most predominant age group and Misra et al<sup>8</sup> & Nikumbh et al<sup>9</sup> reported maximum cases in 30-40 years of age group. In our study negative for intraepithelial lesions/malignancy were reported as 79.6%. This is in concordance with Gupta et al<sup>10</sup> and Sharma et al<sup>11</sup> who reported negative for intraepithelial lesion/malignancy as 79% and 62.5% respectively. In our study epithelial cell abnormality represented 7.6% cases. This is in concordance with Gajashree et al<sup>12</sup> reported epithelial cell abnormality as 8.04%,

Shardamaini et al<sup>13</sup> reported epithelial cell abnormality as 12.81%. In our study amongst the "positive for intraepithelial lesion/malignancy," ASCUS was the most common comprising of 4% cases followed by LSIL comprising of 2.2% of the cases and HSIL comprising 1% of cases. AGUS and squamous cell carcinoma were the least prevalent epithelial lesions, a finding similar to Lahari et al<sup>6</sup>. In our study highest number of cases positive for malignancy were seen in the age group of 40-49. Malpani et al<sup>14</sup> also reported most malignant cases in the age group of 41-50.

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### Conclusion

Cervical cytology is a simple and cost-effective method for early detection of intraepithelial lesions and malignancy especially in a developing country like ours. Pap smear examination should be established as a routine diagnostic aid by creating awareness regarding its utility and importance amongst women by using various mass media communication platforms along with easy availability in all primary health centres and subdistrict hospitals.

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