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Cytopathological pattern of cervical pap smears at tertiary care hospital in year 2023

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Abstract

Background: Cervical cancer is one of the leading causes of morbidity and mortality. It can be preventable and diagnosed early with adequate and repetitive cytological screening by pap test. The conventional cervical cytological screening is the most common technique used throughout the world. The objective of this study was to estimate the prevalence of cervical cytological pattern in females by using conventional Papanicolaou (Pap) smears for the screening of inflammatory, premalignant and malignant lesions of the cervix.

Materials & Methods: A one year retrospective descriptive study was conducted in Department of Pathology of BJ Medical College and civil hospital, Ahmedabad to evaluate all the pap smears reported during January 2023 to December 2023. Smears were assessed according to the Bethesda system for reporting cervical cytology third edition. A total of 1108 cases were analyzed. Prevalence of epithelial abnormalities was calculated in percentages.

Results: A total 1108 patients were screened. Most women were in the age range of 30-50 years and multiparous. There were 757(68.32%) normal Pap smears, with 302 (27.26%) abnormal pap smear and 49 (4.42%) unsatisfactory or inadequate samples. Total 130 (11.73%) cases showed epithelial cell abnormalities. Atypical squamous cells of undetermined significance (ASCUS) was the most commonly found (5.78%) epithelial cell abnormality.

Conclusion: This study emphasized the importance of Pap smears screening for early detection of premalignant and malignant lesions of cervix. Incidence of invasive cervical malignancy can be prevented if Pap screening program is effectively implemented in target population.

Keywords: Cervical pattern, pap smear, Epithelial cell abnormality, Atypical squamous cells of undetermined significance (ASCUS), Bethesda system

Introduction

India has a population of 511.4 million women ages 15 years and older who are at risk of developing cervical cancer. Current estimates indicate that every year 123907 women are diagnosed with cervical cancer and 77348 die from the disease. Cervical cancer ranks as the 2nd most frequent cancer among women in India and the 2nd most frequent cancer among women between 15 and 44 years of age [1].

The screening for cervical cancer is based on the assumption that early detection may allow early treatment. It is a well-known fact that cytology based screening programs has resulted in dramatic reduction in the incidence and mortality of invasive cervical cancer in different countries of the world [2].

Cervical cancer is preventable by detecting it in premalignant stages by exfoliative cytology such as papanicolaous (pap) smear examination. Pap smear test was first introduced in 1943 by George Papanicolaous to detect abnormal cancer cell in cervix. On global scale, the Pap test remains the single best cancer screening procedure and cervical cancer the most preventable form of cancer related death among women. To date, Conventional and liquid based cytology are two methods of Pap test in use. Conventional Pap test is the mainstay screening system in India [3-5].

Precursor lesion can be detected on gross examinations. But, women usually present to the clinics only when they have symptoms, such as pain, discharge, and/or abnormal bleeding [6].

Reporting of pap smears using the Bethesda System for reporting cervical cytology has unified various overlapping terminologies and created a standardized framework for laboratory reports that includes a descriptive diagnosis and an evaluation of specimen adequacy [7]. Hence, we have undertaken the present study using the new Bethesda System, with the intention to estimate the prevalence of cervical epithelial abnormalities.

The objective of this study was to detect prevalence and pattern of cervical cytological changes of study population by using conventional Papanicolaou (Pap) smear for the screening of inflammatory, premalignant and malignant lesions of the cervix.

Materials and Methods

The study was a one year retrospective descriptive study conducted in Department of Pathology of BJ Medical College and civil hospital, Ahmedabad to evaluate all the pap smears reported during January 2023 to December 2023. We screened 1108 sexually active women, were more than 17 years of age. Women with different complaints, including vaginal discharge, postcoital bleeding, Irregular cycle and bleeding per vagina and pain. History and symptoms were recorded.

Written informed consent was obtained from all women.

Patients were placed in the lithotomy position, and a sterile bivalve speculum was inserted into the vagina. A sample was taken from the cervix by rotating a wooden Ayre spatula 360°. The sample was quickly smeared onto a labelled glass slide and fixed with 95% ethyl alcohol in a jar. The glass slides were sent to the Department of Pathology for cytopathological examination. All the slides were stained with Papanicolaous stain and reported according to the Bethesda System for Reporting Cervical Cytology third edition. All the women with abnormal finding were followed up and underwent treatment as per standard protocol.

Results: Total 1108 patients were screened.

Table 1: Distribution of patients according to age

Age in years	No of patients	Percentage (%)
17-30	265	23.91%
31-40	354	31.95%
41-50	236	21.30%
51-60	177	15.98%
61-70	76	6.86%
Total	1108	100%

Most women were in the age group of 30–50 years in this study. Prior to taking test women were asked about presence of any symptoms.

Table 2: Symptoms of women attending gynecological OPD.

Symptoms	No. of patients	Percentage (%)
Asymptomatic	432	38.99%
White discharge per vaginum	287	25.90%
Postcoital bleeding	18	1.62%
Irregular cycle	304	27.44%
Postmenopausal bleeding	51	4.60%
Something coming out through per vaginum	11	1.0%
Frequency of micturation	5	0.45%
Total	1108	100%

Most women were asymptomatic. Most common presenting complaint was irregular menstruation followed by White discharge per vaginum and Post-menopausal bleeding.

Table 3: Clinical findings on per speculum examination.

Clinical examination	Number	Percentage (%)
Healthy cervix	442	39.90%
Cervical erosion	266	24.0%
Chronic cervicitis	232	20.94%
Discharge	121	10.92%
Bleeding on touch	47	4.24%
Total	1108	100%

On per speculum examination (Table 3) most common finding was healthy looking cervix (39.90%) followed by cervical erosion (24.0%).

PAP smear examination was done of all cases.

Table 4: PAP smear examination report.

Cytological finding	No of patients	Percentage of total cases (%)
Unsatisfactory sample	49	4.42%
Adequate sample	1059	
NILM	757	68.32%
Inflammatory	152	13.72%
Atrophy	20	1.81%
ASCUS	64	5.78%
LSIL	20	1.80%
HSIL	16	1.45%
ASC-H	15	1.35%
SCC	5	0.45%
AGUS	10	0.90%
Total	1108	100%

Out of 1108 Pap smears, 757(68.32%) normal Pap smear while 302(27.26%) abnormal Pap smears (including epithelial cell abnormalities, inflammation and atrophic smear). Total 130 (11.73%) cases showed epithelial cell abnormalities. Among them atypical squamous cells of undetermined significance (ASCUS) was the most common found (5.78%) epithelial cell abnormality.

Table 5: Distribution of inflammatory lesions.

Inflammatory lesions	No of patients	Percentage (%)
Non-specific inflammation	70	6.31%
Bacterial vaginosis	33	2.98%
Trichomonas vaginalis	21	1.90%
Reactive changes	23	2.08%
Candidiasis	05	0.45%

Microscopic examination

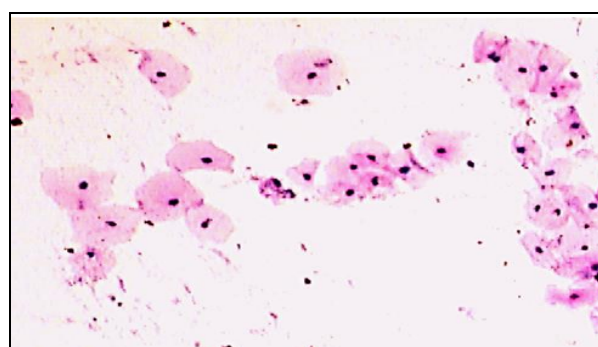


Fig 1: Negative for squamous intraepithelial lesions or malignancy (NILM): Superficial squamous cells without any cytological atypia (Papanicolaou stain).

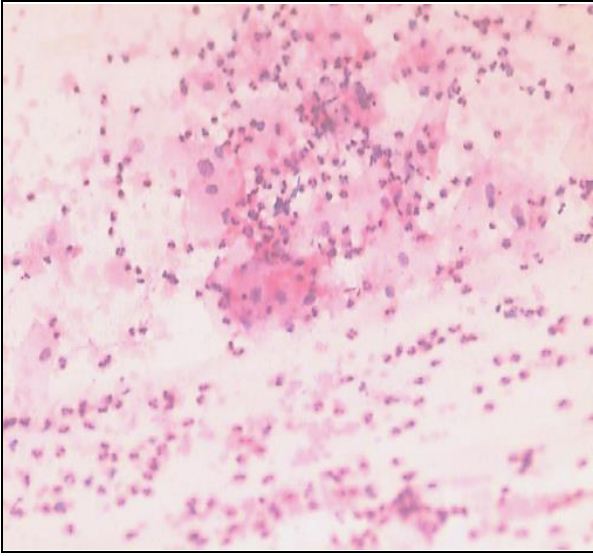


Fig 2: Smear shows changes of non-specific inflammation (Papanicolaou stain).

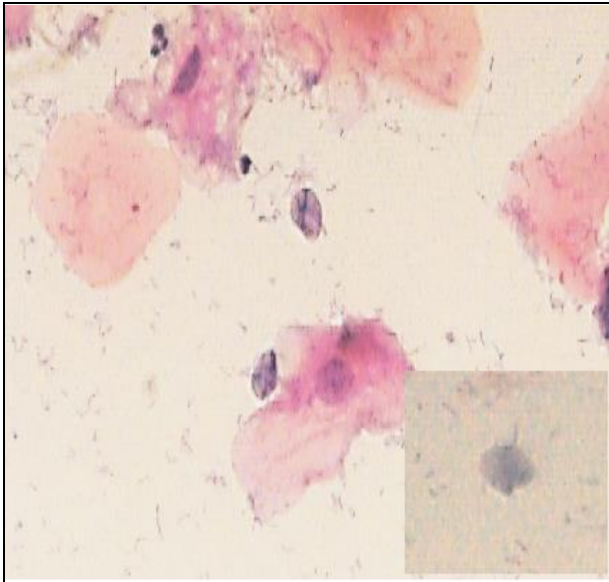


Fig 3: Trichomonas vaginalis: Pear shape organism with flagella and small eccentrically placed nucleus (Papanicolaou stain).

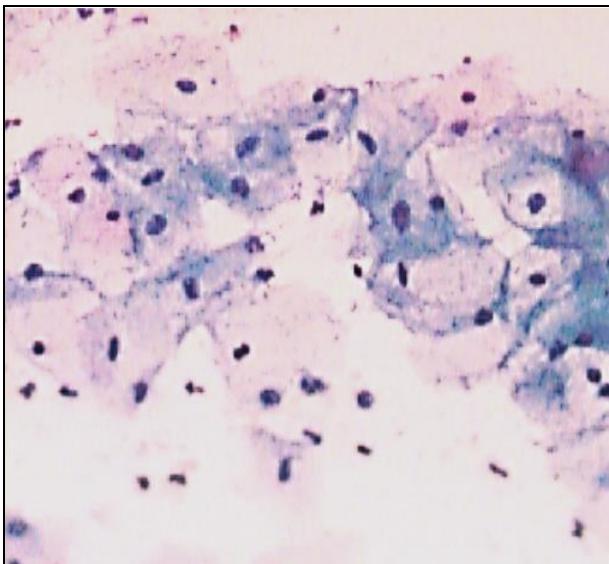


Fig 4: Bacterial vaginosis: Clue cells present. (Papanicolaou stain).

Microscopic Examination

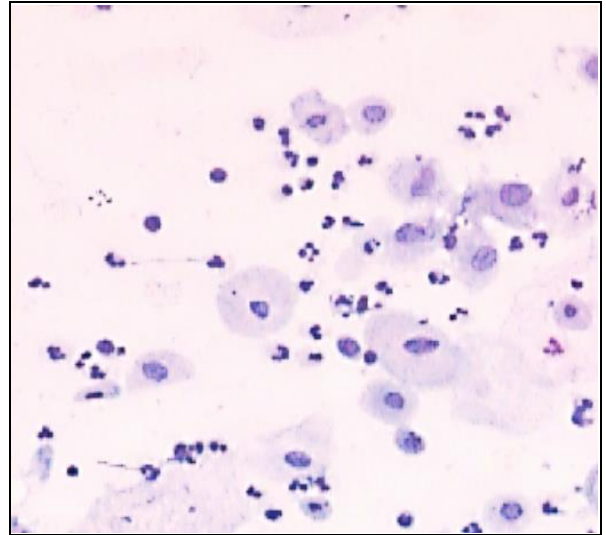


Fig 5: Atrophy with basal cells and naked nuclei (Papanicolaou stain).

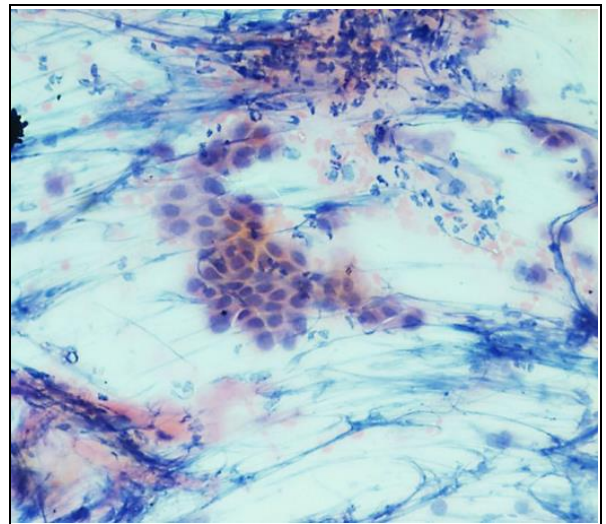


Fig 6: Atypical squamous cells of undetermined significance (ASCUS): Occasional atypical cells in the inflammatory background (Papanicolaou stain).

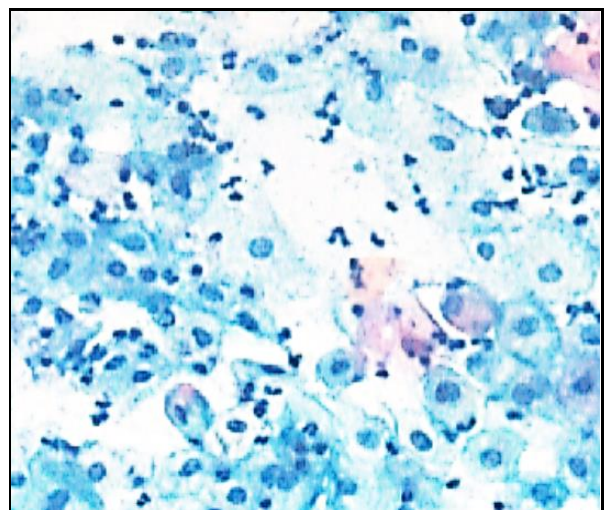


Fig 7: LSIL-Variable sized atypical cells, irregular nuclear membrane with inconspicuous nucleoli and binucleation present (papanicolaou stain).

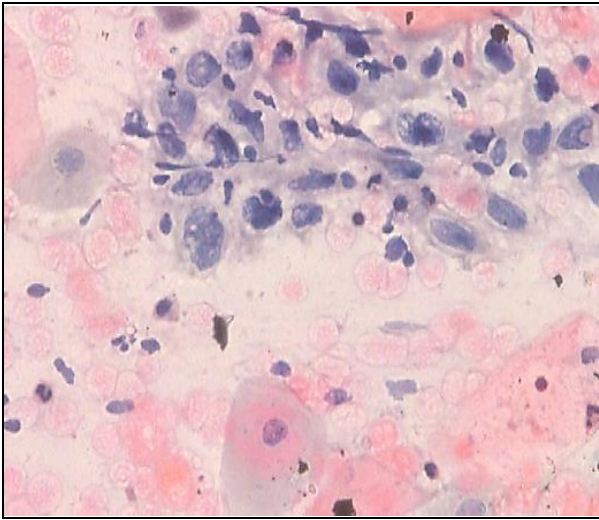


Fig 8: HSIL: Syncytial sheet of parabasal type cells, variation in size and the shape of the nuclei, hyperchromatic nuclei, irregular nuclear membrane, and high N:C ratio (papanicolaou stain).

Microscopic Examination

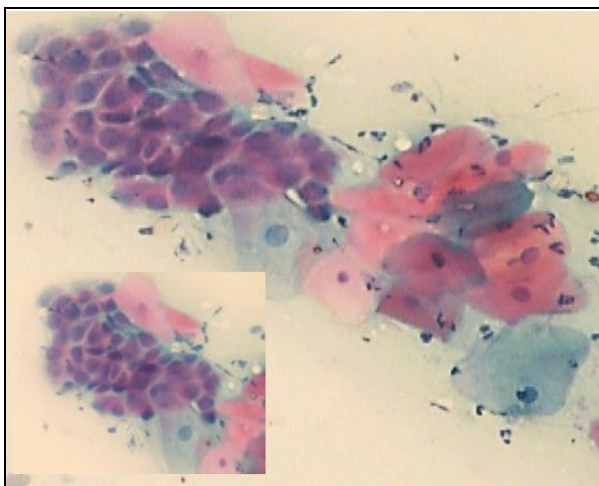


Fig 9: ASC-H: Cluster of cells with high N:C ratio, Hyperchromasia and irregular nuclear membranes features are worrisome but insufficient for HSIL (papanicolaou stain)

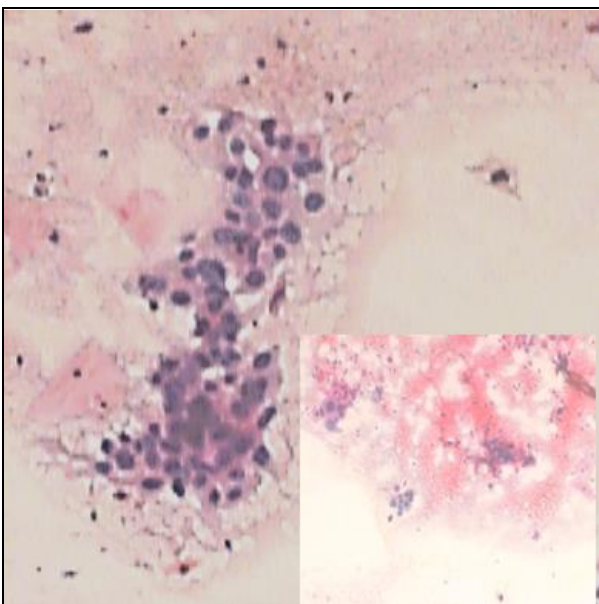


Fig 10: Squamous cell carcinoma (SCC): Pleomorphic malignant cells and necrosis in background (papanicolaou stain).



Fig 11: Atypical glandular cells of undetermined significance (AGUS): Endocervical cell-round to oval atypical cell with high necleo: cytoplasmic ratio (papanicolaou stain).

Discussion

Cervical cancer is a potentially preventable cancer. It is preceded by premalignant lesions which may take 5-15 years to progress to invasive cancer. If detected and treated timely, pre-invasive disease has nearly 100 percent cure rate with simple surgical procedure, while advanced cancers have less than 35 percent survival rates [8].

Early detection can reduce mortality and morbidity related to cervical cancer. Risk factors for cervical cancer are persistent or chronic infection with high risk HPV 16, 18, 31, 33, 45, 58; immunodeficiency; tobacco smoking; presence of other sexually transmitted diseases and long term oral contraceptive use [9].

To eliminate cervical cancer (4/100,000 women worldwide), the WHO recommends screening 70% of women twice between the ages of 35 and 45 [10].

Fifty three percentages of cases belonged to the generation of 31-50 years in present study, the recommended age group by the WHO to achieve the target of cervical cancer's elimination. Similarly, Tummidi *et al.* observed most common age group of screening patients was 31-40 years, followed by 41-50 years [11].

In the Bethesda System for reporting cervical cytology, the "Epithelial cell abnormality: Squamous" includes squamous intraepithelial lesion (SIL) category, which comprises a spectrum of squamous cell lesions starting from the precancerous lesions of LSIL to HSIL and invasive squamous cell carcinoma (SCC) [12].

Depending on the qualitative and quantitative constraints of the material, certain ambiguous morphological characteristics that are indicative of squamous cell abnormalities may fall under an equivocal category: "Atypical Squamous Cells" (ASCs), which are categorized into two categories; ASCs undetermined significance (ASCUS) or ASCs cannot exclude HSIL (ASC-H) [12].

The unsatisfactory smears ranged from 1% to 16.06% in the Rawat K *et al.* And Shrestha khadka S *et al.* studies. While in present study it was 4.42% which are fall within range of above two study [13-15].

Patients with unsatisfactory smears should undergo a careful evaluation since they may have benign or preneoplastic or neoplastic diseases [16]. To decrease the rate of unsatisfactory smears in conventional Pap smears, gynecologists must take extra precautions with proper

sampling techniques. They should also keep in mind the predictors for unsatisfactory conventional Pap smears. However, the rate of unsatisfactory Pap smears significantly

reduces in liquid based cytology compared to conventional Pap smears [17].

Table 6: Comparison of results of present study with other three study

Diagnosis	Rawat K, <i>et al.</i>	Shrestha khadka S, <i>et al.</i>	Kaustubh M, <i>et al.</i>	Present study
No.of cases	1768	1999	610	1108
NILM	25.17%	74.7%	89%	68.32%
Inflammation	54.07%	21.96%	50.1%	13.72%
Atrophy	1.47%	15.50%	-	1.81%
Epithelial cell abnormality	3.22%	5.75%	10.9%	11.73%
ASCUS	1.3%	4.5%	3.27%	5.78%
LSIL	0.79%	0.85%	1.95%	1.80%
HSIL	0.45%	0.15%	0.99%	1.45%
ASC-H	0.28%	-	-	1.35%
AGUS	0.23%	0.25%	-	0.90%
SCC	0.17%	0.2%	0.65%	0.45%
unsatisfactory	16.06%	2.8%	-	4.42%

In accordance with the results of Shrestha Khadka S *et al.* and Kaustubh M, *et al.* studies, we also found NILM in 68.32% of the cases the most common interpretation category. However, it conflicts with the findings of Rawat K *et al.*, who found that inflammation (54.07%) was the most frequent interpretation category, and NILM was seen in only 25.17 % of their cases [13-15].

The inflammatory smear in the Rawat K, *et al.*, Shrestha khadka S, *et al.* and Kaustubh M *et al.* studies was 54.07%, 21.96% and 50.1% respectively. While in present study it was 13.72% [13-15].

In present study atrophy was 1.81% which is similar to Rawat K *et al.* study (1.47%) [13].

The other three study shows different ranges of epithelial cell abnormalities [13-15]. In present study smears with abnormal epithelial changes (130) represented 11.73% (130/1108) of total smears taken. We observed ASC-US, ASC-H, LSIL, HSIL, SCC and atypical glandular cells (NOS) in 5.78%, 1.35%, 1.80%, 0.45%, 1.45%, and 0.90%, respectively, Total 130 (11.73%) cases showed epithelial cell abnormalities. Among them Atypical squamous cells of undetermined significance (ASCUS) was the most common found (5.78%) epithelial cell abnormality similar to Shrestha khadka S, *et al.*, Kaustubh M, *et al.* and Rawat K, *et al.* study [13-15]. Pap smear-positive women need adequate treatment and regular follow-up. Thus, we have to strengthen our health services and health-care system to include screening at primary health centres [18].

Conclusion

Pap test is a cost effective cancer screening test and is a simple method to detect various non-neoplastic as well as neoplastic lesions of cervix. Early detection of precancerous lesions by Pap smear and subsequent proper treatment can be helpful in prevention of cervical cancer.

The Pap test has been regarded as the gold standard of cervical screening programs. When the Pap test is combined with an HPV DNA test, the sensitivity for detection of cervical pathology is increased.

Knowledge regarding cervical cancer and Pap smear is very poor among general population. It is important that there should be awareness program and educational activities for cervical cancer. Patients attending outpatient department for routine problems should also be counselled for the same. By introducing a well-planned screening program, we can

reduce cervical cancer related mortality and morbidity

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