



## Original Research Article

## Spectrum of epithelial abnormalities on papanicolaou smear in postmenopausal women

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## ABSTRACT

**Background:** The Papanicolaou (Pap) smear was introduced in 1941, became the standard screening test for cervical cancer and premalignant lesions, and is being used globally.

**Objectives:** To estimate the frequency of various epithelial abnormalities on Pap smear in postmenopausal women and assess their relation with parity, clinical symptoms and per speculum findings.

**Study design:** Prospective

**Materials and Methods:** Pap procedure was done on 400 postmenopausal women from November 2017 to June 2019 and smears were stained and cytological interpretation was made according to the 2014 Bethesda system.

**Result:** Out of 97.5% satisfactory smears, 17.9%, 26.2% and 55.9% were diagnosed as of epithelial abnormalities, normal cytology and inflammatory and other benign conditions respectively. ASCUS-mean age was 45.18 years and parity of 3. Patients were either asymptomatic or presented with white discharge. Incidence among epithelial abnormalities was 31.5% with overall incidence of 5.6%. LSIL- mean age was 48.11 years and parity of 4 and presented with white discharge and lower abdominal pain. Incidence was 37.2% among epithelial abnormalities with overall incidence of 6.7%. HSIL- mean age was 58.78 years with parity of  $\geq 5$ , presented with white discharge and lower abdominal pain. Incidence among epithelial abnormalities was 27% with overall incidence of 4.8%. SCC -mean age was 58.6 years and parity of  $\geq 5$ , presented with white discharge, postmenopausal bleed and something coming out of p/v. Incidence was 4.2% among epithelial abnormalities with overall incidence of 0.8%.

**Conclusion:** Pap smear is a simple, cheap, safe and gold standard diagnostic tool for screening postmenopausal women.

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## 1. Introduction

Screening of Cervical cancer is known to reduce mortality by early detection and treatment.<sup>1</sup> It is the commonest and dreaded disease of women in India.<sup>2</sup> It can be prevented in the vast majority of women, because of the well-defined natural history and long detectable preclinical phase, the uterine cervix cancer gets priority in terms of control program through mass screening.<sup>3</sup> Cervical cancer incidence peaks at the age of 55–59 years, older and poor women are at the highest risk of developing cancer. Most

of the cases (85%) present in advanced and late stages, and more than half (63%–89%) have the regional disease at the time of presentation.

Human Papilloma Virus (HPV) is responsible for the development of abnormal cells in the cervix.<sup>4</sup> Chances of exposure with HPV increase with the number of sexual activity and partners. There is no known way to effectively prevent transmission of this virus or treat it once it is acquired. Since HPV can remain dormant for many years, even if a woman is currently not sexually active, she may have the virus as a result of past sexual activity. In today's era, in spite of availability of HPV vaccine and affordable

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and effective methods for early detection and treatment of cervical cancer still continues to be a public health problem in India. It is highly probable that cervical cancer incidence rates are an underestimate for India possibly due to under diagnosis of cases in rural areas and among most impoverished women. A regular Pap smear is the only way that women can be certain that any abnormal cells they may develop can be dealt with appropriately, so it is important to create widespread awareness about the necessity of regular screening, including the postmenopausal period.<sup>5,6</sup>

Pap test not only plays a crucial role in the detection of cervical cancer and its precursor lesions but also aids in the diagnosis of other conditions as well such as infective and inflammatory conditions.<sup>7</sup> Being simple, effective, and versatile, the Pap smear becomes an integral part of routine clinical examination and large population at risk can be screened. Pap smear screening has sensitivity of 50%–75% and specificity of 98%–99%.<sup>6</sup> The mortality rate of cervical cancer can be significantly reduced if a woman is screened once when she is between the age of 40–45 years.<sup>3</sup>

## 2. Aim & Objectives

1. To study the spectrum of epithelial abnormalities on Papanicolaou smear in postmenopausal women
2. To estimate the frequency of various epithelial abnormalities on Pap smear & to assess its relation with parity, clinical symptoms and per speculum findings in postmenopausal women.

## 3. Material and Methods

Pap procedure was done on 400 postmenopausal women from November 2017 to June 2019 who came to cytology department of our Institute for examination. Patient's consent was taken before doing the procedure. This study was done after Institutional approval. Smears were stained with Pap and MGG stains. The cytological interpretation was made according to the 2014 Bethesda system. Inclusion criteria were; postmenopausal women attending the outpatient department presenting with excessive vaginal discharge, blood stained discharge, post coital bleeding & postmenopausal bleeding. Exclusion criteria were; abnormal vaginal bleeding with known uterine or hormonal cause, inaccessible cervix & patient with visible cervical growth.

## 4. Observation and Results

Total of four hundred post-menopausal cases were taken during the study period.

Among 400 cases, 10 cases (2.5%) were unsatisfactory for evaluation due to low squamous cellularity and they were excluded from the study. In remaining 390 cases, 330 cases (82.5%) were satisfactory for evaluation and had transformation zone while 60 cases (15%) were

obtained satisfactory for evaluation but lacked endocervical cells/transformation zone. (Figure 1)

Out of 390 satisfactory cases, epithelial abnormalities were found in 70 (17.9%) cases. (Figure 2)

Among 70 cytologically diagnosed cases of epithelial abnormality LSIL was the most common abnormality found in 26 cases (37.2%) followed by ASCUS in 22 cases (31.5%) and HSIL in 19 cases (27.1%). SCC was reported in 3 cases (4.2%). The overall incidence of LSIL was 6.7%, ASCUS was 5.6%, HSIL was 4.8% and that of SCC was 0.8%. Cases of other squamous and glandular abnormalities were not found among our study population. (Table 1)

The age ranged from 41–80 yrs. with the mean age of 52.6 yrs. The majority of women were in 51–55 yrs. of age group comprising 114 cases (29.3%), followed by 46–50 yrs. age group which constituted 100 cases (25.6%). The age group 41–45 yrs showed highest number of ASCUS cases. LSIL was highest among 46–50 yrs. of age group, while HSIL was highest in 56–60 yrs. age group. The mean age for ASCUS was 45.18 yrs., for LSIL 48.11 yrs., mean age for HSIL and SCC was 58.78 yrs. and 60 yrs respectively. The age group 71–75 yrs. showed highest overall incidence of epithelial abnormality followed by age group 66–70 yrs (26.6%). (Table 2)

In our study, 108 cases (27.6%) had a parity of  $\geq 5$  followed by 102 cases (26.2%) with parity of 4 forming the largest two groups. Nulliparity was seen in only 2 cases (0.5%). The majority of women with high incidence of various epithelial abnormalities had parity  $\geq 5$  followed by 4 and 3. (Table 3)

Among all the patients 380 cases (97.4%) were symptomatic and 10 cases (2.6%) were asymptomatic. The most common presenting complain was white discharge per vaginum in 169 cases (43.4%) followed by lower abdomen pain in 142 cases (36.4%) and burning micturition, dysuria and increase frequency of micturition in 55 cases (14%). Most common presenting symptoms associated was something coming out of vaginum in which incidence of epithelial abnormalities were 30% and white discharge in which incidence of epithelial abnormalities were 23.5%. On per speculum examination, unhealthy cervixes were reported in 160 cases (41.1%) patients. (Table 4)

## 5. Discussion

Despite being Preventable cervical cancer is not prevented, at least in developing countries like India, 80% of all the cases of cervical cancer occur in these developing countries. Even after the widespread screening and acceptance of the Pap smear, morbidities, and mortalities from cervical cancer has not been eliminated. Cervical cancer is the most widely screened cancer in both developed and developing countries. The goal of cervical cancer screening is to detect preinvasive lesions, which results in a reduction in incidence and mortality from invasive cervical cancer.<sup>7</sup>

**Table 1:** Distribution of satisfactory cases according to epithelial abnormality

S. No.	Epithelial abnormality	No. of cases	Overall incidence
1	ASCUS	22(31.5%)	5.6%
2	LSIL	26(37.2%)	6.7%
3	HSIL	19(27.1%)	4.8%
4	SCC	03(4.2%)	0.8%
	Total	70	17.9%

**Table 2:** Relation between epithelial abnormalities and age in satisfactory cases.

S. No.	Age(yrs.)	No. of cases	ASCUS	LSIL	HSIL	SCC	Overall incidence
1	41-45	58	10	06	02	00	30.9%
2	46-50	100	03	09	03	00	15%
3	51-55	114	07	04	02	01	12.3%
4	56-60	60	00	05	05	00	16.6%
5	61-65	32	02	01	03	01	21.9%
6	66-70	15	00	00	03	01	26.6%
7	71-75	07	00	01	01	00	28.6%
8	76-80	04	00	00	00	00	00
Total		340	22	26	19	03	

**Table 3:** Relation between epithelial abnormalities and parity in satisfactory cases.

S. No	Parity	No. of cases	ASCUS	LSIL	HSIL	SCC	Overall incidence
1	0	02	00	00	00	00	-
2	1	20	00	01(5%)	00	00	5%
3	2	80	06(7.5%)	00	03(3.7%)	00	11.2%
4	3	78	08(10.2%)	06(7.7%)	02(2.6%)	00	20.5
5	4	102	05(4.9%)	10(9.8%)	05(4.9%)	01(0.9%)	20.5
6	>/=5	108	03(2.8%)	09(8.3%)	09(8.3%)	02(1.8%)	21.2%
7	unmarried	00	00	00	00	00	-
	Total	390	22	26	19	03	

**Table 4:** Relation between epithelial abnormalities and symptoms in satisfactory cases.

S. No.	Symptom	No. of cases	ASCUS	LSIL	HSIL	SCC	Overall incidence
1	Postmenopausal bleed	04	00	00	01(25%)	01(25%)	50%
2	lower abdominal pain	142	05(3.5%)	10(7%)	08(5.6%)	00	16.1%
3	White discharge	169	15(8.8%)	15(8.8%)	09(5.3%)	01(0.6%)	23.5%
4	Something coming out per vaginum	10	01(10%)	00	01(10%)	01(10%)	30%
5	Burning micturition	55	00	01(1.8%)	00	00	1.8%
6	No complains	10	01(10%)	00	00	00	10%
	Total	390	21	26	19	03	

**Table 5:** Comparison of cytological findings between present study and other studies

S. No	Study	Normal (%)	Inflammatory & other benign condition (%)	Epithelial abnormalities (%)
1	Chate et al <sup>8</sup>	25.23	45.49	24.3
2	Shaki et al <sup>6</sup>	52.8	23.8	19.1
3	Gupta et al <sup>9</sup>	30	66.3	3.23
4	Sood R et al <sup>10</sup>	41.6	40.7	3.53
5	Bal M S et al <sup>11</sup>	16.7	74.3	5
6	Shashidhar et al <sup>12</sup>	51.30	42.17	2.9
7	Present study	26.2	55.9	17.9

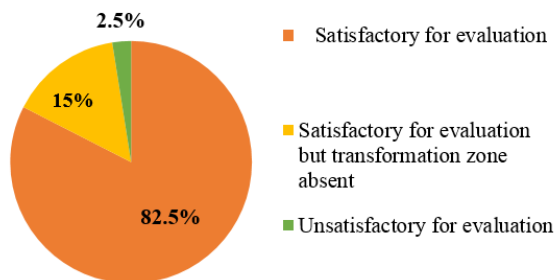
**Table 6:** Comparison of overall incidence of each epithelial abnormality with other studies.

S. No.	Study	ASCUS (%)	LSIL (%)	HSIL (%)	SCC (%)
1	CAKMAK B et al <sup>13</sup>	15.7	3	4	0.5
2	Shaki et al <sup>6</sup>	0	6.8	6	0
3	Bal M S et al <sup>11</sup>	0.3	2.7	0.7	1.3
4	Shashidhar et al <sup>12</sup>	1.62	0.6	0	0.6
5	Chate et al <sup>8</sup>	2.03	13.28	4.94	2.4
6	Kaiho et al <sup>14</sup>	1.9	4.9	3.9	2.9
7	Present study	5.6	6.7	4.8	0.8

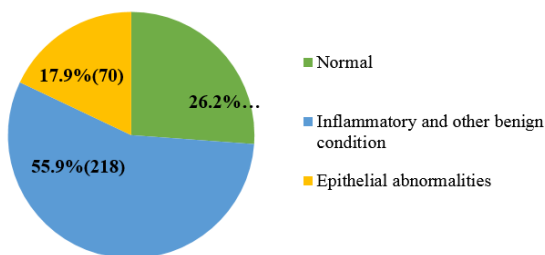
**Table 7:** Comparison of presenting complain among satisfactory cases with other study.

S. No.	Study	White discharge	Lower abdomen Pain	Postmenopausal bleed
1	Bal M S et al <sup>11</sup>	59%	19.3%	1%
2	Shaki et al <sup>6</sup>	36.5%	7.4%	5%
3	Mishra et al <sup>15</sup>	12.6%	19.2%	1.3%
4	Present study	43.4%	36.4%	1%

Distribution of cases according to adequacy of specimen

**Fig. 1:** Distribution of cases according to adequacy of specimen

Distribution of satisfactory cases according to cytological examination

**Fig. 2:** Distribution of satisfactory cases according to cytological examination

Among 400 women, 97.5% cases (390 women) who were satisfactory for evaluation were included in this study and 2.5% cases which was excluded from study population were unsatisfactory (Figure 1) which was close to study by Chate et al<sup>8</sup> (4.95%) and 1% in Shaki et al.<sup>6</sup> High incidence of unsatisfactory smears was reported by Mahadik et al<sup>16</sup> (14.85%) and Gupta et al (18.94%).<sup>9</sup> This variation may be due to difference in number of study population.

The age of patients ranged from 41-80 yrs. with a mean age of 52.6 yrs. in our study which is comparable to CAKMAK B et al<sup>13</sup> study and Kaiho N et al<sup>14</sup> study which include age group 45-80 yrs. and 44-79yrs respectively. Maximum number of cases who underwent Pap procedure, were in the age group of 51-55yrs followed by 46-50yrs (Figure 2) which was similar to studies by Kaiho N et al<sup>14</sup> and Mahadik et al.<sup>16</sup>

On cytological examination 55.9% cases were reported as inflammatory and other benign condition, 26.2 % cases had normal cytology and 17.9% were diagnosed as having epithelial abnormalities, which were comparable with the study done by Chate et al<sup>8</sup> and Shaki et al.<sup>6</sup> (Table 5 )

In present study, overall Incidence of ASCUS was 5.6% which is higher than Shashidhar RM et al<sup>12</sup> and Chate et al<sup>8</sup> study and lower than CAKMAK B et al study.<sup>13</sup> Incidence of LSIL was 6.7 % which was comparable with Shaki et al<sup>6</sup> (6.8%) and Kaiho et al(4.9%).<sup>14</sup> HSIL was reported in 4.8% cases which was similar to the study by Chate et al<sup>8</sup> (4.94%) and CAKMAK B et al (4%).<sup>1</sup> SCC was 0.8% in present study which was also almost similarly seen in study by Shashidhar RM et al (0.6%),<sup>12</sup> Bal et al<sup>11</sup> (1.3%) and CAKMAK et al (0.5%).<sup>13</sup>

LSIL and ASCUS were the most common epithelial abnormalities reported. Our finding was similar to those of Shaki et al<sup>6</sup> in which incidence of LSIL was 6.8%. A study conducted by Abati et al<sup>17</sup> states that nuclear enlargement alone is not sufficient for diagnosing ASCUS or SIL in postmenopausal cervico-vaginal smears. Nuclear enlargement in squamous cell is an expected normal reactive change that resolves with the application of local estrogen. Nuclear features are more reliable for diagnosing SIL.

HSIL was the 3<sup>rd</sup> most common abnormality reported with 4.8% incidence, a similar high incidence was seen in the study by CAKMAK B et al<sup>13</sup> (4.0%) and Chate et al (4.94%).<sup>8</sup> The recognition that HSIL is likely to progress

to invasive cancer, whereas most low-grade lesion regress spontaneously, raises awareness that eradicating HSIL is critical for cancer prevention. Hence, more emphasis must be given for detecting HSIL at early stage, before it progresses to invasive cancer. The incidence of SCC was 0.8% in present study which was in concordance with the studies of Bal et al (1.3%),<sup>11</sup> Shashidhar et al<sup>12</sup> (0.64%) and Rana et al (0.6%).<sup>18</sup> (tab-6Table 6 )

In our study, we concluded that among epithelial abnormality, 31.5% of the epithelial abnormality cases had ASCUS which came out to be much higher when compared with the study done by Bukhari et al (9.8%).<sup>5</sup> The incidence of LSIL in our study was 37.2% which was in concordance with the studies done by Bukhari et al (45%)<sup>5</sup> and Shaki et al (32.3%).<sup>6</sup> HSIL was 27% in our study, whereas it was 21.8% in Bukhari et al<sup>5</sup> study and 16.3% in Shaki et al study.<sup>6</sup> The incidence of SCC was 4.2% in present study and 13.7% in Bukhari et al study.<sup>5</sup> Difference in incidences is due to different age and geographical area at time of presentation.

In present study ASCUS was seen more in the age group of 41-45 yrs. with mean age of 45.18yrs., whereas it was 37.6 yrs. in Rana et al study.<sup>18</sup> LSIL was more in 46-50-years age group with mean age of 48.11 years as compare to study by Rana et al<sup>18</sup> which had mean age 33.4yrs., and 32.4yrs. in Bal MS et al study.<sup>11</sup> HSIL was reported more in 56-60 yrs. with mean age of 58.78 yrs., whereas it was 44 yrs. in Rana et al<sup>18</sup> study and 40.5 yrs. in the study done by Bal MS et al.<sup>11</sup> SCC was found in 61-70-yrs of age group with mean of 60 yrs. which was almost similar as 59yrs. in Rana et al<sup>15</sup> study and 57 yrs. in Bal M S et al.<sup>11</sup> Possible reasons for difference in mean age is due to different age group between both studies.

Parity wise distribution of satisfactory cases ( $\geq 3$ ) of present study was similar to study by Mishra et al.<sup>15</sup> Women who had parity of 4 were 26.2% and  $\geq 5$  were 27.6%, as also stated in Mahadik et al<sup>16</sup> study (19.3% and 19.1% respectively). Mahadik et al<sup>16</sup> and Gupta et al<sup>9</sup> noted the highest incidence of cervical dysplasia/cancer in parity of  $\geq 3$ . We noted the similar result in present study, overall incidence of epithelial abnormalities was 21.2% in  $\geq 5$  parity followed by parity of 3 and 4 i.e. 20.5% each.

The incidence of epithelial abnormalities in women with postmenopausal bleed, something coming out per vaginum, discharge per vaginum and lower abdominal pain was 50%, 30%, 23.5% and 16% respectively in the present study (tab 4), which was similar to previous studies by Mishra et al<sup>15</sup> and Kaiho et al. Variations in findings in comparison with other studies may be due to differences in sample size and duration of study period. (Table 7 )

## 6. Limitations of the present study

The greatest problem faced was a lack of follow-up of patients diagnosed with epithelial abnormalities. Biopsies were not done. Few previous studies; like study by Mahadik

et al<sup>16</sup> also faced same problems. Another limitation was possibility of false negative results which could be due to background blood, mucus and inflammatory cells causing obscuration of abnormal cells as also seen in study by Akshatha et al.<sup>19</sup>

## 7. Conclusion

In present study, Incidence was seen higher in multipara and women presented with white discharge and prolapse. A higher percentage (17.9%) of epithelial abnormalities was seen in present study, maximum cases reported were of ASCUS and LSIL. Postmenopausal women are at increased risk of cervical cancer, detection of cervical cancer during the preinvasive period by screening of postmenopausal women and early intervention prevents its progression to life threatening illness. Cervical screening is one of the best defences against the development of cervical cancer, so postmenopausal patients can be offered screening whenever they visit gynaecology OPD as most of them might have never been screened & have increased risk of cervical cancer. Pap smear is a simple, affordable, feasible, accurate and safe diagnostic tool for implementation in all health care settings. Pap test has been regarded as the gold standard for cervical screening programs.

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## 9. Conflict of Interest

The authors declare they have no conflict of interest.

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