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Original Research Article

Study of Pap Smear In Post-Menopausal Women

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Abstract

Background: Cervical cancer is the second most common malignancy among Indian women, with persistent infection by high-risk human papillomavirus (HPV) as its principal cause. Although Pap smear screening has significantly reduced cervical cancer mortality, postmenopausal women are often under-screened due to misperceptions of low risk and obscured pathology from atrophic changes. This study aimed to evaluate the cytomorphological spectrum of cervical lesions in postmenopausal women and assess associations with demographic and clinical factors.

Materials and Methods: This prospective observational study was conducted in the Department of Obstetrics and Gynecology in collaboration with the Department of Pathology at a tertiary care teaching hospital over six months. A total of 100 postmenopausal women attending the outpatient clinic were included after informed consent. Cervical scrap smears were collected, fixed, and stained by the Papanicolaou method and reported using the 2014 Bethesda System. Data were analyzed for correlations between cytological outcomes and variables including age, parity, presenting complaints, and marital history. Fisher's exact test was applied, with $p<0.05$ considered significant.

Results: Among 100 women, the most common age group was 41–50 years (57%). NILM was reported in 61% of smears, while 39% showed abnormalities including ASC-US (26%), LSIL (5%), HSIL (4%), ASC-H (1%), and SCC (1%). Acute cervicitis (39%) and bacterial vaginosis (17%) were frequent benign findings. Abnormal smears increased significantly with age ($p=0.009$) but showed no significant association with parity ($p=0.241$) or symptoms ($p=0.404$).

Conclusion: Pap smear remains an essential screening tool in postmenopausal women, as a considerable proportion harbored premalignant and malignant lesions, including asymptomatic individuals. Routine cytological evaluation should be encouraged in this group for early detection and timely intervention.

Keywords: Pap Smear, Cervical Cytology, Postmenopausal Women, Cervical Cancer Screening, Bethesda System.

Introduction

Cervical cancer remains a major global health problem, ranking as the fourth most common malignancy in women and the second leading cancer among Indian women.

Persistent infection with high-risk HPV types 16 and 18 is the primary cause, with cofactors such as multiparity, early sexual activity, and poor screening coverage further increasing risk. Despite vaccines and Pap smear screening, large sections of women in India remain unscreened. [1,2]

In postmenopausal women, physiological changes such as epithelial atrophy and reduced hormonal influence may mask early lesions. [3] Many women in this age group also perceive themselves to be at lower risk and therefore do not undergo screening, resulting in delayed detection and poorer outcomes. Regular Pap smear screening, however, has been shown to significantly reduce mortality. [4,5]

Against this background, the present study was conducted to evaluate the spectrum of cervical cytological findings among postmenopausal women.

The aim was to assess the role of Pap smear screening in both symptomatic and asymptomatic

individuals and correlate cytology with demographic and clinical factors, thereby emphasizing its continuing importance beyond reproductive age.

Materials and Methods

This prospective observational study was conducted in the Department of Obstetrics and Gynecology, in collaboration with the Department of Pathology, at a tertiary care teaching hospital over a period of six months. A total of 100 postmenopausal women attending the gynecology outpatient department with various complaints were enrolled.

After obtaining informed consent, detailed demographic and clinical information was recorded using a structured proforma. Ethical approval for the study was obtained from the Institutional Ethics Committee, and all procedures were performed in accordance with the Declaration of Helsinki. Cervical scrap smears were collected, fixed in 95% ethanol, and stained using the Papanicolaou method (Rapid-Pap kit, Biolab Diagnostics Pvt. Ltd., India). Smears were reported according to the 2014 Bethesda System.[6]

The study population comprised postmenopausal women who had attained natural menopause and provided written informed consent to participate. Women with surgical menopause and those belonging to the reproductive age group were excluded from the study.

Cases with inadequate or poorly preserved smears were considered unsatisfactory and categorized accordingly. This strict application of inclusion and exclusion criteria ensured that the analysis focused specifically on the cytological profile of naturally postmenopausal women.

Data were compiled from the smear reports and correlated with demographic variables such as age, parity, age at marriage, and duration of married life, as well as with presenting complaints. Descriptive statistics were used to summarize categorical variables as frequencies and percentages. Associations between cytological outcomes (normal vs. abnormal) and age group, parity, and clinical presentation were assessed using Fisher's exact test. A p-value <0.05 was considered statistically significant. The findings were presented in tabular and graphical form for clarity.

Results

Among the 100 post-menopausal women, 57 were in the age group of 41–50 years, 29 were in the 51–60 years group, 9 were in the 61–70 years group, 3 were in the 71–80 years group, and 2 were above 80 years. In the age group of 41–50 years, 42 women had NILM, 12 had ASCUS, and one case each of LSIL, HSIL, and unsatisfactory smear were reported. In the 51–60 years category, 15 women had NILM, 8 had ASCUS, 3 had LSIL, 1 had HSIL, 1 had ASC-H, and 1 was unsatisfactory. In the 61–70 years group, 3 were NILM, 3 were ASC-US, 1 was LSIL, and 2 were HSIL. In the 71–80 years category, 1 was NILM and 2 were ASCUS. In the group above 80 years, 1 was ASC-US and 1 was ASC-H. Of the 100 women studied, 6 were nulliparous, 29 had two children, and 65 had three or more children.

Table 1: Relation of various lesion with parity

Sr No	Parity	Nilm	Ascus	Lsil	Hsil	Scc	Asc-h	Unsatisfactory	Total
1	Nulliparous	02	02	02	0	0	0	0	06
2	2	20	7	02	0	0	0	0	29
3	>=3	39	17	01	04	01	01	02	65
Total		61	26	5	4	1	1	2	100

Out of 100 Pap smears examined, 2 were unsatisfactory, 61 were NILM, 26 were ASC-US, 5 were LSIL, 4 were HSIL, 1 was ASC-H, and 1 was SCC. No cases of AGUS were reported. On cytological examination, acute cervicitis was observed in 39% of women, chronic cervicitis in 5%, bacterial vaginosis in 17%, and trichomonas vaginosis in 3%. Normal findings were reported in 36% of women. No cases of atrophic changes, acute on chronic cervicitis, or metaplasia were noted. Age at marriage among 100 cases was 18–20 years in 22 women, 21–25 years in 54 women, and 26–30 years in 24 women. Among 100 cases, married life of less than 20 years was noted in 12 women, 21–30 years in 54 women, 31–40 years in 26 women, and more than 40 years in 8 women.

Table 2: distribution of cases according to presenting complaints

Sl no	Complaints	No of cases	Percentage (%)
1	White discharge, itching	48	48
2	Abdominal pain	22	22
3	Post coital bleeding	8	8
4	Post-menopausal bleeding	14	14
5	Screening(asymptomatic)	8	8

Table 3: Association between age group and cytology outcome among post-menopausal women

Age group	Normal (nilm)	Abnormal (asc-us & above + unsatisfactory)	Total	P value
41-50	42(73.68)	15(26.32)	57	0.009* (significant)
51-60	15(51.72)	14(48.27)	29	
61-70	3(33.33)	6(66.66)	9	
71-80	1(33.33)	2(66.66)	3	
>80	0(0)	2(100)	2	
TOTAL	61	39	100	

Table 4: association between symptoms and pap smear findings

Clinical status/pap smear	Nilm/normal	Abnormal	P value
Symptomatic	56(60.8%)	36(39.2%)	0.404
Asymptomatic	5(83.3%)	1(16.66%)	

Table 5: Association between smear status and parity

Sr No	Parity	NILM(/normal)	Abnormal	Total	P value
1	Nulliparous	2(33.33)	4(66.7)	6	0.241
2	2	20(69)	9(31)	29	
3	>=3	39(60)	26(40)	65	
Total		61(61)	39(39)	100	

Discussion

In the present study, the majority of Pap smears among postmenopausal women were reported as negative for intraepithelial lesion or malignancy (NILM, 61%), while 39% showed abnormalities including ASC-US, LSIL, HSIL, ASC-H, and one case of squamous cell carcinoma. These results emphasize that even after menopause, women remain vulnerable to cervical epithelial abnormalities. Compared to Madhuri et al. (79.4%) [7] and Ashok Verma et al. [8] (90%), our study reported a lower proportion of normal cytology, but higher than that observed by Kavya et al. (41.3%) and Kannan et al. (34.2) [9], reflecting geographical and demographic variability.

When abnormal smears were analyzed, ASC-US was the most frequent abnormality (26%), far exceeding the rates reported by Madhuri et al. [7] (1.4%), Kavya et al. (4.4%), and Ambedkar Raj et al. (8.8%). LSIL and HSIL accounted for 5% and 4% of cases respectively, figures broadly in line with Ashok Verma et al. [8] (5.5% and 2.5%) but lower than Ambedkar Raj et al. (17.5% and 4.5%).

Rare findings such as ASC-H (1%) and squamous cell carcinoma (1%) were consistent with the low incidence described in most series. The absence of AGUS in the current study parallels the findings of several Indian reports, which also noted negligible rates of glandular abnormalities.

Age-specific distribution revealed that abnormal cytology was relatively uncommon in the 41–50 years group (26.3%) but increased steadily thereafter, with all women above 80 years showing abnormal smears. This significant association (p=0.009) indicates that advancing age is an important predictor of epithelial abnormalities. Kavya et al. [10] similarly reported higher abnormalities in women aged 50–60 years, while Aminisani et al. [11] observed a rising trend in those over 60 years. These findings highlight that older postmenopausal women remain at risk, warranting continued surveillance even beyond the conventional reproductive years.

Parity did not show a statistically significant association with cytological outcome (p=0.241), though multiparous women (≥3 children) demonstrated more abnormalities (40%) compared to women with two children (31%) or nulliparous women (67% abnormal but in very small numbers). Our observations echo Aminisani et al. [11], who also reported a predominance of abnormalities among women with high parity. This suggests that repeated childbirth, cervical trauma, and prolonged hormonal exposure may predispose to dysplastic changes, although nulliparous women too appear to carry risk, possibly due to other host factors. Clinical presentation showed limited predictive value for cytological outcome. While most symptomatic women had normal smears (60.8%), 39.2% were abnormal; among asymptomatic women, only one case (16.7%) demonstrated abnormal cytology, with no significant statistical association (p=0.404).

This aligns with studies by Ashok Verma et al. [8], who found that common symptoms like vaginal discharge and bleeding did not always correlate with cytological abnormalities. Within the NILM group, acute cervicitis (39%) and bacterial vaginosis (17%) were common, reflecting the persistence of inflammatory conditions after menopause. Such benign conditions may mask more serious lesions, emphasizing the continued relevance of Pap smear screening in this age group.

Conclusion

The present study demonstrates that Pap smear screening continues to hold significant value in postmenopausal women, as a considerable proportion of cases showed epithelial abnormalities despite the majority being cytologically normal.

Abnormal findings ranged from ASC-US to high-grade lesions and carcinoma, with advancing age showing a significant association, while parity and symptoms did not reliably predict outcomes.

Importantly, abnormalities were also detected in asymptomatic women, underscoring the silent nature of cervical disease.

These findings emphasize that routine Pap smear screening is indispensable for postmenopausal women irrespective of clinical presentation, as early detection and timely intervention can help reduce disease progression and ultimately decrease the burden of cervical cancer in this vulnerable group.

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