



## Original Article

# Study of Cervical Cytology (Pap Smear) in Symptomatic Postmenopausal Woman in Tertiary Care Hospital

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## Abstract

**Objective:** *The atrophic changes in menopause reflected in cytology is known, but relevance of other features in menopausal management is relatively unknown. Present study was undertaken to evaluate the clinical profile and cervical cytomorphology in symptomatic postmenopausal woman.*

**Material and Methods:** *A total of 112 postmenopausal patients who presented with symptoms related to urogenital atrophy were studied. Adequacy, density of inflammation with numerical scoring, specific pathogens and predominant cell type were assessed in each smear and correlated with presenting symptoms and duration of menopause.*

**Result:** *The most Common presenting urinary symptom was dysuria, Increased frequency, Urgency and associated with fever and suprapubic pain. Smears of all patients showed inflammation, varying in intensity, irrespective of the presenting symptoms with a high incidence of candidiasis (12.5%). Two patients who had ASCUS (Atypical squamous cell of uncertain significance) on smears had carcinoma on follow up. 7 patients who opted for HRT were followed up with cytology.*

**Conclusion:** *Cytology (Pap Smear) in postmenopause can be used other than to assess hormonal status, to screen for malignancy, pathogens in inflammation and to monitor hormone replacement therapy.*

**Keywords:** *Postmenopause, Infections, Cytology, Urogenital Atrophy.*

## Introduction

Menopause was defined as cessation of menstruation for a minimum period of one year, and they are no longer able to bear a children. Menopause typically occurs between 49 to 52 years of age. It may also defined by a decrease in hormone production by the ovaries.

Much attention has been paid to the long term sequele associated with the postmenopausal estrogen deficient state such as osteoporosis and cardiovascular disease Although urogenital atrophy and related complaints are often mentioned in connection with the climacteric and postmenopause, their impact on the quality of life are not generally taken into consideration. Given

the high prevalence of the problems and the existence of possibilities for relief, recognition and analysis of these problems are of great relevance in order to improve to these women's quality of life.

Cytological studies show that 90% of women are hypoestrogenic while only 10% still retain an estrogenic smear. The estrogen receptors are present in the vaginal and urethral wall, trigone of the bladder wall and in the pelvic musculature. Hence the lack of estrogen stimulation causes not only atrophic changes of the vagina, but also of the urethra and bladder. A consequent reduction in the glycogen content leads to the loss of lactobacilli and subsequently the vaginal acidity losing the natural barrier against infections. Clinical consequences of these changes are a predisposition to a variety of genitourinary complaints and recurrent infections including those by low virulence organisms. Enhoming et al has demonstrated that midcycle cervical mucus would support the growth and migration of *Proteus mirabilis*. A drop in estrogen level at the midcycle supporting the growth of the organisms provided evidence for the hormonal control on the mucosal immune system of the genitourinary tract.

Many epidemiological studies have demonstrated that more than 50% of postmenopausal women suffer from urogenital complaints and that the prevalence of symptoms increases with the increasing age. The changing demographic trends due to improved medical facilities indicate number of women requiring treatment for urogenital complaints is also expected to rise in the future. With such a background, the present study correlates the cytological picture with the clinical features of women who presented with one or more symptoms related to urogenital atrophy in menopause.

### Materials and Methods

Present study was conducted in the Department of Pathology, Sri Krishna Medical college, Muzaffarpur with the help of Department of

Microbiology and Department of Obstetrics and Gynecology, during the period of October 2017 to April 2018. A total of 112 postmenopausal women who attended the outpatient department who had cervical smears and had natural menopause were included for the study. The hospital records were reviewed for the presenting symptoms, duration of menopause, type of menopause and the treatment given. The postmenopausal patients who did not have adequate clinical details or inadequate smears on cytology were excluded from the study.

The smears had been taken with cotton tipped swab stick from the cervix and from the vagina. Smears were fixed in alcohol and stained with Hemotoxylin and eosin stain and Papanicalaou stain. The pathologist blindly reviewed the smears. The smears were assessed for adequacy, density of inflammation, predominant cell type, reactive changes which included metaplasia, presence of background organisms and specific pathogens and the nature of the inflammatory infiltrate including the predominant cell. Among these density of inflammation was given a score ranging 1+ to 4+. Maturation index was done when the inflammation was minimal. In rest of the smears, which were maximum, the relative proportion of the parabasal cell, inter-mediate cell and superficial cells was assessed to correlate between the cell type and the duration of menopause. After the evaluation, cytological and the clinical features were correlated to analyses between the duration and age of onset of menopause and the cytological picture.

The treatment was given depending upon the presenting complaint and the cytology report. This included hormone replacement therapy (HRT), antibiotics, urethral dilatation Kegel's exercises and surgery. Depending on the cytological report 8 patients had follow up biopsy

### Result

The age of the women who were Included for the study ranged from 40 years to 76years and the duration of the menopause ranged from one year

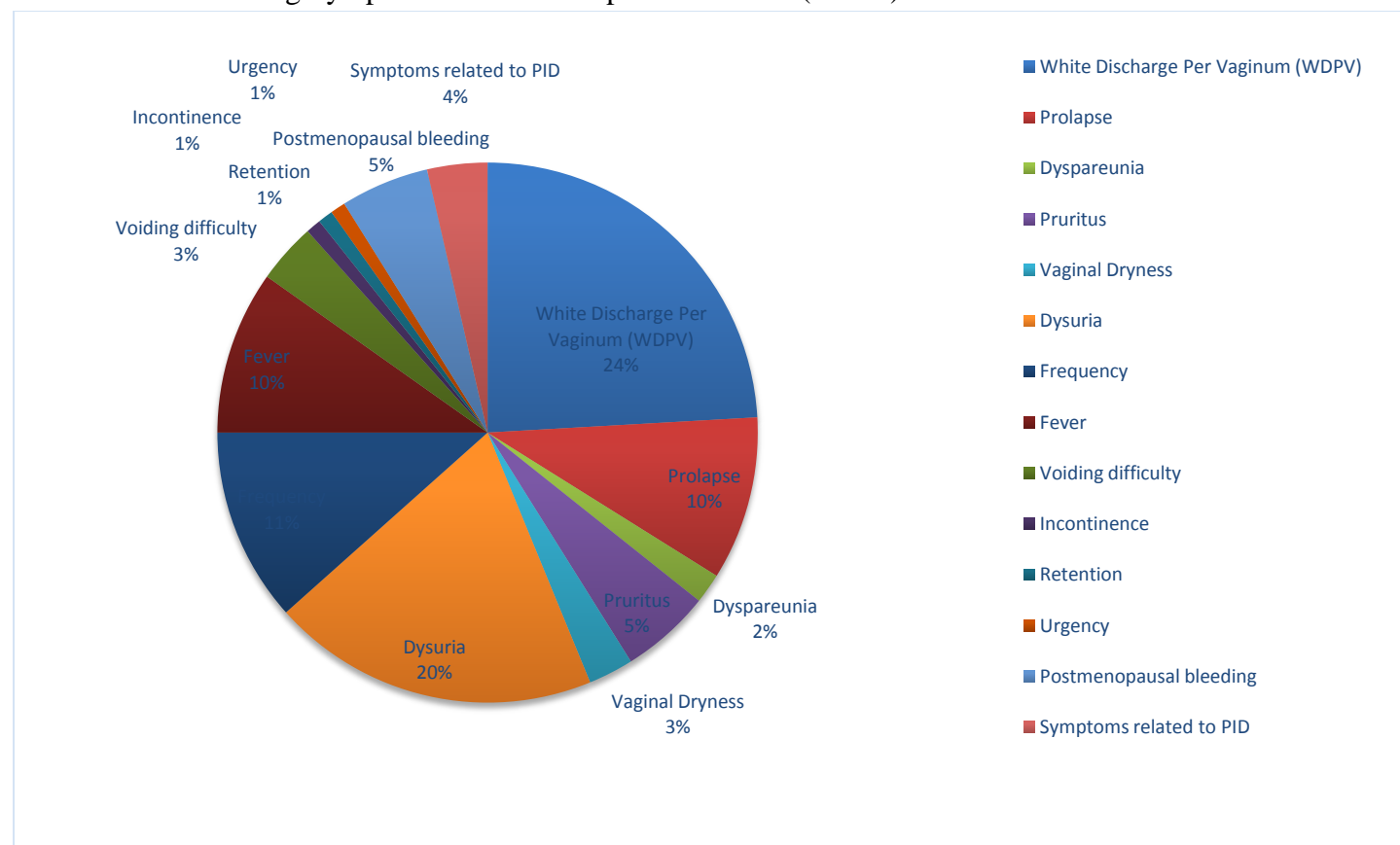
to more than 25 years. 65% of the study group who initially presented with symptoms were in the age range of 45 to 60 years. The earliest age at menopause was 38 years.

The symptoms were grouped as relating to the cervix and vagina and to the urinary tract. White discharge per vagina was the most common presenting complaint (n=27) while dyspareunia was present only in 2 patients. Among the complaints relating to the urinary tract, dysuria was the most common complaint (n=22). The others were frequency, Fever, voiding difficulty, incontinence, retention, and urgency. 10 Patients could not be categorized into either of the groups. Among them 6 had postmenopausal bleeding and 4 of them had symptoms related to pelvic inflammatory disease. 36 patients had more than one complaint. The symptoms and the percentage of the patients presenting has been summarized in Table – 1.

Evaluation of cytologic smears showed all patients, irrespective of the groups, with evidence of inflammation but density ranged from 1+ to 4+.

Forty eight patients had more than 3+ intensity of inflammation. These patients were postmenopausal for more than five years. Neutrophils were the predominant cell seen in the inflammatory infiltrate. 40 smears, in addition showed macrophages in smears. The specific pathogens included candida (n=14) and chlamydia (n=4). 18 smears showed features of bacterial vaginosis. Coccobacilli overgrowth was observed in 30 smears. Lactobacilli in the background was present only in 18 smears (Table – 2). The predominant cell type was the intermediate cell (n=75) while the classical features of atrophy with mainly parabasal cells were seen in 34 smears. One smear showed equal proportion of parabasal cells and intermediate cells while two smears showed superficial cell predominance (Table – 3). Correlation of duration of menopause and the predominant cell type did not show any significance but the predominantly parabasal pattern was definitely observed fifteen years after menopause.

**Pie Chart 1** Presenting Symptoms of Postmenopausal Woman (n=112)



**Table 1** Presenting Symptoms of Postmenopausal Woman (n=112)

	Symptoms	No. of Patients	Percentage %
<b>Group I Patients (Cervico-vaginal Symptoms)</b>	White Discharge Per Vaginum (WDPV)	27	24.1
	Prolapse	11	9.8
	Dyspareunia	2	1.8
	Pruritus	6	5.4
	Vaginal Dryness	3	2.7
	<b>Group II Patients Urinary Symptoms</b>	Dysuria	22
Frequency		13	11.6
Fever		11	9.8
Voiding difficulty		4	3.6
Incontinence		1	0.9
Retention		1	0.9
Urgency		1	0.9
<b>Non-Specific Symptoms</b>	Postmenopausal bleeding	6	5.3
	Symptoms related to PID	4	3.6

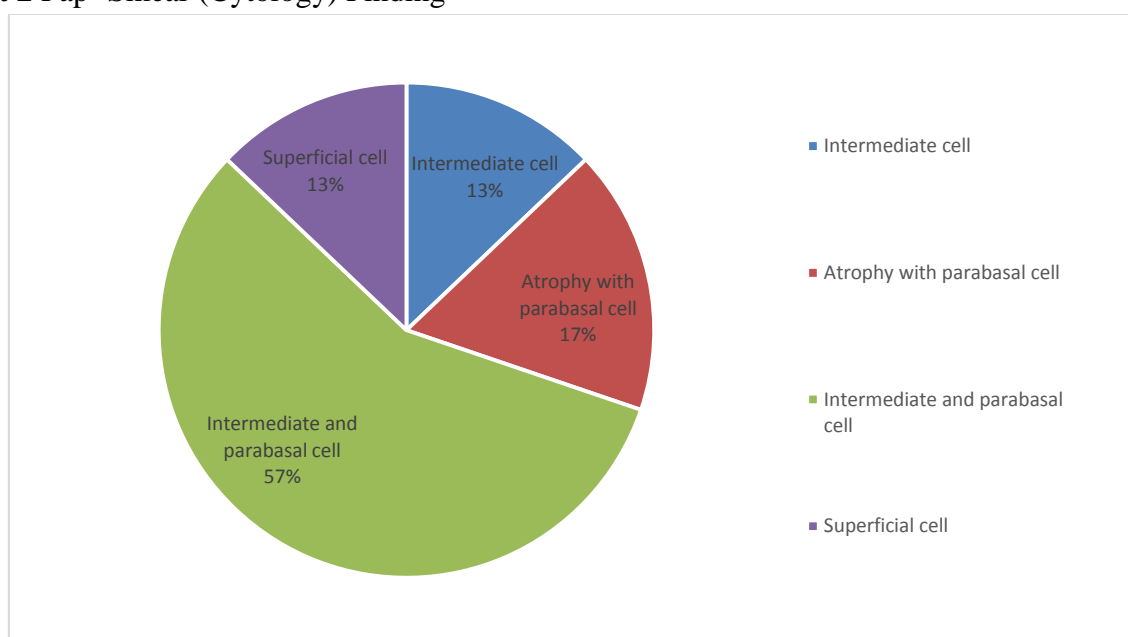
**Table 2** Pathological finding of smear

Pathological finding	No. of Patients	Percentage %
> 3+ Intensity of Inflammation	48	42.8
NeutrophillPredominent	40	35.3
Candida	14	12.5
Chlamydia	4	3.6
Bacterial Vaginosis	18	16.07
Coccobacilli	30	26.06
Lactobacilli	18	16.07

**Table 3** Pap- Smear (Cytology) Finding

Pap- Smear Finding	No. of Patients	Percentage %
Intermediate cell	75	66.97
Atrophy with parabasal cell	34	30.4
Intermediate and parabasal cell	1	0.9
Superficial cell	2	1.8

**Pie Chart 2** Pap- Smear (Cytology) Finding



### Treatment Details

75 patients who were treated with antibiotics and / or antifungal agents had symptomatic relief. Two showed ASCUS (atypical squamous cells of uncertain significance) in the smears.

These patients on biopsy showed carcinoma cervix and Wertheim's hysterectomy was performed on these patients. 6 patients who had postmenopausal bleeding were followed up with curettage and one of them had endometrial carcinoma. The rest as they did not show any significant result on smear or biopsy are being followed up. Eight patients after completely recovering from infection had a repeat episode of inflammation within a period of two months. 29 patients who presented with complaints related to the menopause, but did not show any significant cytological pictures were counseled about the menopause and the options available for treatment. Only 7 patients opted for HRT and had relief of their symptoms. The rest of them were lost to follow up.

### Discussion

In menopausal research, urogenital atrophy constitutes a special area. Many elderly women who are affected may experience significant inconvenience and distress but many of them suffer silently unless encouraged to discuss these problems by their physicians. During the reproductive age, cytology plays a significant role in screening and in the detection of pathogens in inflammation. But cytological studies related to menopause are limited either due to the limited number of patients seeking help or the difficulty in follow up of the patients. With increase in the rate of prescription HRT, the role of cytology may probably increase as an index to estrogen replacement therapy for complaints related to UGA. It has been observed 74% of postmenopausal women in India presented with complaints related to UGA compared to 20% in the western literature. The present study correlates the clinical profile of patients who presented with

symptoms related to UGA and the cytological picture in a tertiary care hospital.

The possible presence of infection is suggested many times based on the cytological criteria. Wilson et al found that inflammatory changes on cytology are often associated with infection while Parson et al had findings contrary to it. However, in a postmenopausal state, the same criteria of inflammatory changes due to infection may not apply. Clinically 28% of patients presented with symptoms of infection such as WDPV (white discharge per vagina), PID or UTI while all 112 patients showed evidence of inflammation in the smears, though the density of inflammation varied from 1+ to 4+. Only on 18% of smears, a specific pathogen could be demonstrated, indicating the inflammatory changes in the smears do not always reflect cervical infection in the post-menopausal age group.

Symptomatic vulvovaginal candidiasis is an estrogen dependent infection associated with pregnancy and oral contraceptive and hence rare in postmenopausal smears. 14 patients in the study series showed candidiasis both clinically and on smears, which is high in this patient group. This high incidence may be due to other factors like in immuno-suppression (malignancies 2, steroid therapy-1 and broad-spectrum antibiotics-2 or iatrogenic-1). The three patients who did not show any probable cause for candidiasis had partners who were diabetic. A similar trend was seen in 12 of postmenopausal women who had recurrent urinary infection. In addition to other risk factors of recurrent infection in postmenopausal women, partners as a reservoir of infection also should be borne in mind.

Cervico vaginal flora represents an ecosystem that is constantly changing due to hormonal influences. One of the most striking change in the effect of hormonal influence on lactobacilli. The lowest prevalence occurs before puberty and after menopause. Thirty Four patients presented with decreased or almost absence of lactobacilli while 26.8% showed coccoid overgrowth. In a study by Larsen and Galask where cervico vaginal flora of

postmenopausal women treated with estrogen and not treated with estrogen were compared, it was observed there was no difference in the prevalence of facultative species. However anaerobic isolates tended to be less prevalent among estrogen treated women. The low pH of the vagina and the predominance of lactobacilli are commonly assumed to represent a cause effect relationship. The same authors found a predominance of anaerobic bacteria in menopausal women, which responded to estrogen therapy. They postulated that low pH led to increased H<sup>+</sup> concentration which increased the redox potential causing a less favorable environment for anaerobic organisms. More over the menopausal woman lack organic compounds like aliphatic acids, aromatic alcohols, immunoglobulins and lysosomes which are normally present in cervical secretion which influences the microbial colonisation. In the present study, when the association of absence of lactobacilli, predominant cell type and the duration of menopause was analysed, in 24/34 smears which showed predominant parabasal cell, showed absence of lactobacilli, thus reinforcing the findings by other authors.

### Conclusion

This study reinforces the cytological findings associated with menopause with a clinical correlation. The results highlight the increased incidence of vaginal candidiasis and possible use of cytology in monitoring hormone replacement therapy to evaluate the hormonal status. Hence to the triad of menopause management "ask, look and recognize" a fourth factor may be added as "do cytology" in the future.

### References

1. Rich-Edwards JW, Manson JE, Hennekens CH, Buring JE. The primary prevention of coronary heart disease in women. *N Engl J Med* 1995; 332:1758-66.
2. Deward F, Pot H, Tonckens-Nanniga NE, Baanders, van Halewin EA, Thijssen JHH.

- Longitudinal studies on the phenomenon of postmenopausal estrogen. *ActaCytol* 1972; 16:273-8.
3. Anklesaria BS, Krishna UR, Sheriar NK. Climacteric symptoms and urogenital problem. In: Krishna UR, Shah D, eds. *The menopause*. Madras: Orient Longman Ltd., 1996:12-25.
4. Enhoming G, Lars H, Mecen B. Ability of cervical mucus to act as a barrier. *Am J ObstetGynecol* 1970; 108:532-7.
5. Iosif CS, Bekassy Z. Prevalence of genitourinary symptoms in the later menopause *ActaObstetGynaecolScand* 1984; 63:257-60.
6. Gail A, Green D, Lee NP, Amola ER. The Menopause. *Lancet* 1999; 353:571-80.
7. Wilson JD, Robinson AJ, Kinghorn S, Hicks DA. Implications of inflammatory changes on cervical pathology. *BMJ* 1990; 300:638-40.
8. Parsons WI, Godwin M, Robbins C, Butler R. Prevalence of cervical pathogens in women with and without inflammatory changes on smear testing. *BMJ* 1993; 306:1173-4.
9. Mendling W. *Vulvo vaginal candidiasis*. New York: Springer—Verlag, 1988:27-30.
10. Larsen B, Galask RP. Vaginal microbial flora : composition and influences of host physiology. *Ann Intern Med* 1982; 96: 926-30.