

# Prevalence of Gynaecological Problems and Common Medical Disorders in Postmenopausal Women: A Cross-sectional Study

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## ABSTRACT

**Introduction:** Menopause is marked by cessation of menses brought about by declining ovarian function. This period may present with gynaecological problems, which are often the reason for gynaecological consultations. Many women also suffer from medical disorders and may be unaware of underlying cardiovascular risk factors.

**Aim:** To evaluate the prevalence and nature of gynaecological problems and common medical disorders like hypertension, diabetes mellitus and hypothyroidism in postmenopausal women.

**Materials and Methods:** This cross-sectional study was conducted in the Outpatient Department (OPD) of Obstetrics and Gynaecology, at Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, India, from January 2023 to December 2023. A total of 284 women were enrolled after consent, basic demographic details, including age at menopause and reason for consultation, were noted, and blood pressure, height, and weight were recorded. Following a thorough gynaecological consultation, investigations like complete blood count, blood

sugars, and thyroid function test were done. Data was recorded, and analysis was done using mean, Standard Deviation (SD) and percentages.

**Results:** The mean age at presentation was  $58.15 \pm 7.70$  years, mean duration since menopause was  $11.24 \pm 8.74$  years. Among them, 136 females (49.4%) attained menopause in the age group 45-49 years. The most common gynaecological reason for consultation was postmenopausal bleeding in 161 (56.7%), followed by urogenital prolapse in 115 (40.5%) and urinary symptoms in 67 (23.6%). During basic examination and investigations, 32 (11.3%) new cases of hypertension, 52 (18.3%) new cases of diabetes mellitus, 19 (6.3%) new cases of hypothyroidism and 12 (4.2%) new cases of other medical problems were diagnosed.

**Conclusion:** Menopause may present challenges due to gynaecological problems. Basic medical disorders can be diagnosed by simple tests at the time of a gynaecological consultation. The gynaecological visit may therefore help in the diagnosis and management of medical disorders, and help in improving the overall health of the postmenopausal woman.

**Keywords:** Cardiovascular disease, Medical disorders, Metabolic syndrome, Postmenopausal bleeding, Postmenopausal symptoms

## INTRODUCTION

Menopause heralds the end of reproductive potential of a woman marked by cessation of menses for over 12 months. This period is preceded by hormonal changes, which bring about significant and often perturbing menopausal symptoms. Though most women experience menopause between 45 to 55 years [1], the age varies with ethnicity, family history, socio-demographic, and environmental factors. Compared with global standards, Indian women attain menopause between 41 and 49 years [2]. A pan-India study defined the average age at menopause in Indian women as 46.2 years [3]. With increasing life expectancy, a woman spends a third of her life in menopause [4] and may experience concerning gynaecological problems needing redressal. Common gynaecological problems in menopause are postmenopausal bleeding and urogenital symptoms [5]. Screening for osteoporosis, cardiovascular diseases, screening for genital cancers and breast cancer, genitourinary syndrome, and sexually transmitted infections may also be done during this hospital visit [6].

This age group is also vulnerable to non communicable diseases and a visit to the gynaecologist should be used as an opportunity to screen for the same and treat in liaison with a physician [7]. Cardiovascular disease is an important cause of morbidity and mortality in menopausal life. Oestrogen, the female hormone, affords protection against cardiovascular risk

during the reproductive years; this is lost following the onset of menopause [8]. Vasomotor symptoms in menopause have the greatest association with the development of cardiovascular disease in future. Prior history of gestational hypertension and gestational diabetes during reproductive years, premature ovarian insufficiency with cessation of menses before 40 years and secondary amenorrhoea due to any reason also enhances cardiovascular risk [9].

Due to paucity of dedicated menopausal healthcare facilities in most of the centres in our country, a visit to a gynaecologist creates an opportunity for overall health assessment of a menopausal woman. Data on this subject, however, is sparse [10,11]. Thus, the present study was planned to assess the reason for gynaecological consultations, rate of common gynaecological problems and common non communicable medical disorders among postmenopausal women.

## MATERIALS AND METHODS

This cross-sectional study was conducted in the Outpatient Department (OPD) of Obstetrics and Gynaecology at Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, from 1<sup>st</sup> January 2023 to 31<sup>st</sup> December 2023. This study was approved by the Institutional Ethics Committee vide letter RC-785/RMLIMS/2023 dated 17.06.23.

**Inclusion and Exclusion criteria:** All postmenopausal women who visited the Gynaecology (GOPD) during this period for various reasons, who consented to participate in the study, were included. Women with cognitive impairment and severe, debilitating conditions were excluded from the study.

## Study Procedure

A total of 312 menopausal women visited the GOPD, of which 16 refused to participate in the study, and 12 were lost during follow-up. The study thus included 284 women in the postmenopausal age group. After noting the reason for presentation, written consent was taken and basic demographic details were noted, including blood pressure, height and weight. Following a thorough gynaecological consultation, investigations like complete blood count, blood sugars fasting and postprandial and thyroid function test were done. Hypertension was diagnosed as a blood pressure reading of systolic blood pressure  $\geq 140$  mmHg and diastolic blood pressure  $\geq 90$  mmHg on two occasions. Blood pressures  $\geq 180/110$  mmHg were labelled as hypertensives based on a single reading. This was in accordance with the 2020 International Society of Hypertension Global Hypertension Practice Guidelines [12].

Diabetes was diagnosed as fasting blood sugar  $\geq 126$  mg/dl and postprandial sugar  $\geq 200$  mg/dL. Blood sugars fasting between 100 and 125 mg/dL, or 2-hour postprandial between 140 and 199 mg/dL were labelled as prediabetics, according to American Diabetes Association guidelines [13].

Serum Thyroid Stimulating Hormone (TSH) was considered normal between 0.35 mU/L and 4.5 mU/L (American Association of Clinical Endocrinologists) [14]. The subclinical hypothyroidism range was considered between 4.5 mU/L and 10 mU/L and  $\geq 10$  mU/L was taken as overt hypothyroidism.

Body Mass Index (BMI) was calculated using the formula: weight (kg) / [height (m)]<sup>2</sup>. The BMI was categorised according to the American Association of Clinical Endocrinologists and American College of Endocrinology Clinical Practice [15]. The waist-to-hip ratio was calculated as waist circumference in centimetres/ hip circumference in centimetres. It was measured in the standing position at the end of expiration.

Both women who were newly diagnosed and those previously diagnosed as hypertensives, diabetic or hypothyroid on treatment were evaluated and referred to a specialist for the same.

## STATISTICAL ANALYSIS

The data was recorded in excel sheet and statistical analysis was done using Statistical Package for Social Sciences (SPSS) 28.0.

## RESULTS

The majority of participants presenting in GOPD were in the age group of 50-59 years 126 (44.4%) [Table/Fig-1]. Most of the participants belonged to urban areas 176 (61.9%), whereas the rest hailed from rural areas.

Age group (years)	n (%)
40-44	7 (2.5)
45-49	48 (16.9)
50-54	61 (21.5)
55-59	65 (22.9)
60-64	42 (14.8)
65-69	35 (12.3)
70-74	23 (8.0)
$\geq 75$	3 (1.0)

[Table/Fig-1]: Age distribution of participants (N=284).

Of the 284 women consenting to participate in the study, nine had surgical menopause, of whom six were operated on for uterovaginal

prolapse and three underwent hysterectomy for abnormal bleeding.

Of the remaining 275 women, the age at natural menopause was between 40-55 years. Nearly half of the participants attained menopause between 45-49 years, 136 of 275 (49.4%) [Table/Fig-2].

At menopause age (in years)	n (%)
40-44	87 (31.6)
45-49	136 (49.4)
50-54	39 (14.2)
$\geq 55$	13 (4.7)

[Table/Fig-2]: Age at menopause n=275.

On analysing the reason for presentation in GOPD, the most common problem was postmenopausal bleeding, accounting for 161 of 284 (56.7%) consultations [Table/Fig-3].

Gynaecological problems	Pathology	n (%)
<b>Postmenopausal bleeding</b>		<b>161 (56.7%)</b>
Benign (n= 98)	Atrophic endometrium	29
	Endometrial polyp	13
	Simple hyperplasia	27
	Fibroid	24
	Premalignant cervical lesion	5
Malignant (n=63)	Carcinoma endometrium	29
	Carcinoma cervix	28
	Atypical endometrial hyperplasia	6
<b>Pelvic organ prolapse</b>		<b>115 (40.5%)</b>
	Uterovaginal prolapse	110
	Vault prolapse	5
<b>Urinary symptoms</b>		<b>67 (23.6%)</b>
	Frequency	22
	Dysuria	33
	Incontinence	12
<b>Discharge per vagina</b>		<b>58 (20.4%)</b>
	Infection	44
	Pyometra	14
<b>Vulval symptoms</b>		<b>38 (13.9%)</b>
	Vulvodynia	9
	Vulval itching	25
	Leukoplakia	4
<b>Abdominal lump</b>		<b>35 (12.3%)</b>
Benign	Benign ovarian mass	12
Malignant	Malignant ovarian mass	23
<b>Backache</b>		<b>29 (10.2%)</b>
<b>Non specific (esp. headache, myalgia, generalised weakness, general health check-up)</b>		<b>46 (16.2%)</b>

[Table/Fig-3]: Prevalence of gynaecological problems in postmenopausal females visiting GOPD.

Only 22.9% (65/284) of females had normal BMI, One percent (3/284) had BMI in the underweight category [Table/Fig-4].

The mean age at presentation was 58.15 years, mean duration since menopause was 11.24 years. Mean systolic and diastolic blood pressures were 134.29 and 82.39 mmHg, respectively. Mean fasting and postprandial blood sugars were 95.11 and 152.57 mg/dL, respectively, which are in the pre-diabetic range. The mean TSH level was 3.14 mU/L [Table/Fig- 5].

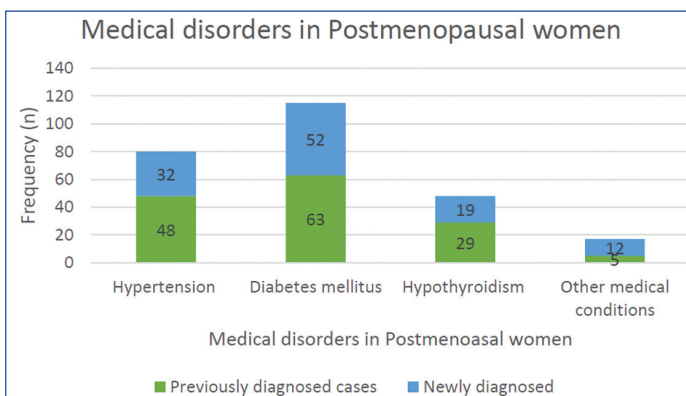
BMI (kg/m <sup>2</sup> )	n (%)	Mean waist-to-hip ratio
<18.5	3 1.0	0.76±0.020
18.5-22.9	65 22.9	0.78±0.027
23-24.9	82 28.9	0.82±0.054
25-29.9	116 40.8	0.88±0.053
≥30	18 6.3	0.91±0.043

**[Table/Fig-4]:** Distribution of participants according to Body Mass Index (BMI) and their mean waist-to-hip ratio

Variables	Mean±SD
Age (years)	58.15±7.70
Duration of menopause (years)	11.24±8.74
BMI (kg/m <sup>2</sup> )	25.26±2.92
Waist-to-hip ratio	0.87±0.045
Systolic BP (mmHg)	134.29±20.06
Diastolic BP (mmHg)	82.39±13.50
Fasting blood sugar (mg/dL)	95.11±32.07
Postprandial blood sugar (mg/dL)	152.57±48.79
Serum TSH levels (mL U/l)	3.14±3.08

**[Table/Fig-5]:** Mean levels of parameters in the study population.

The prevalence of medical problems among the participants was depicted in [Table/Fig-6]. Of the 284 women enrolled, 48 (16.9%) were diagnosed hypertensives, 63 (22.2%) were diabetics, 29 (10.2%) had hypothyroidism, whereas five had other medical problems (1 asthma, 2 chronic kidney disease and 2 hyperthyroidism). During basic examination and investigations, 32 (11.3%) new cases of hypertension, 52 (18.3%) new cases of diabetes mellitus, 19 (6.3%) cases of hypothyroidism and 12 (4.2%) cases of other medical problems (4 chronic kidney disease, 5 hyperthyroidism, 3 chronic obstructive pulmonary disease) were diagnosed.



**[Table/Fig-6]:** Medical disorders in menopausal women.

## DISCUSSION

In the present study, majority of women with postmenopausal problems were in age group 50-59 years. This bears similarity with another study where majority of women presented in the age group 50-59 years [5].

Of all women enrolled, major proportion of women attained menopause between 45 to 49 years. This is in concordance with various other Indian studies where the mean age at menopause was 46.7 years and 46.2 years, respectively [2,3]. A study by Pallikadavath S et al., included over 50,000 postmenopausal Indian women, suggesting the average age at menopause was between 45-49 years in over 49% study participants [16].

The most common reason for gynaecological consultation in our study was postmenopausal bleeding. Of these, nearly 40% (63 of 161 cases of postmenopausal bleeding) had an underlying malignancy (22.2% overall). This finding is also seen in a study in Maharashtra, including 200 postmenopausal women where postmenopausal bleeding was seen in 45% women, however incidence of malignancy

in this study was much lower than in the present study, with 14.4% cases of malignancy [5]. Another Indian study, including 401 postmenopausal women found postmenopausal bleeding in 23.4% cases as a reason for gynaecological consultation, and, 105 cases of gynaecological malignancies accounted for 26.6% of the study population, which is close to the present study [17].

In a significant meta-analysis including more than 40,000 postmenopausal bleeding occurred in around 91% cases, the incidence of endometrial cancer was around 9%, which varied with the socio-demography of the study population [18]. This is much lower than the findings in the present study, with 29 cases of endometrial carcinoma among 161 women with postmenopausal bleeding (18.0%). This may be due to a higher incidence of endometrial cancer in Indian women compared to the western counterparts.

In the present study, malignant cause for postmenopausal bleeding was present in 39.1% cases. This is close to the results of a meta-analysis of 11 studies from India, where the incidence of cervical cancer was found to be 6-29% of all cancers in women [19]. In a study, where 139 histopathological samples were evaluated for postmenopausal bleeding, the most common pathology was cervical carcinoma in 33% cases, followed by uterine malignancy in 9.2% cases [20].

In a study involving 200 women from Amritsar, metabolic syndrome (obesity- measured waist circumference ≥88 cm in women, high blood pressure, impaired blood sugars, and dyslipidemia) was observed in 42% of postmenopausal women, manyfold higher than that in premenopausal counterparts [21].

A large meta-analysis involving 22 studies concluded that obese patient with normal metabolic parameters has 45% higher relative risk of cardiovascular events compared with individuals who have a normal BMI [22].

The incidence of hypertension in menopausal women is estimated to be about 75% with more women suffering from hypertension than men over the age of 65 years [23]. Hypertension is a major modifiable risk factor for cardiovascular disease and control of hypertension has the largest impact on the reduction of cardiovascular mortality in women [24]. A significant number of women were diagnosed as hypertensives on measurement of blood pressure in GOPD. This simple investigation is neglected many times when the presenting symptoms are not related to medical disorders.

Diabetes mellitus is a known cardiovascular risk factor and early menopause has been reported in diabetic women compared with non-diabetics in a study on 600 menopausal women. This study also reported complications related to diabetes in 75% study subjects [25]. Uncontrolled blood sugars are associated with many complications such as recurrent urinary tract infections and vulvovaginitis which may often be the presenting symptom in diabetic women in GOPD.

Study of thyroid function in women shows higher incidence of clinical hypothyroidism with increasing age in menopause, a slight increase in subclinical cases and no change in hyperthyroidism with increasing age in women [26]. Though largely benign, hypothyroidism may cause lethargy, weight gain, and decline in cognitive functions resulting in depressed mood and lack of enthusiasm towards self-care and life. The strength of the present study is its focus on holistic care of postmenopausal women using simple screening for non-communicable medical disorders cost-effectively.

## Limitation(s)

The limitations of the current study are a small number of participants, a lack of distribution of participants according to age groups for comparison of various parameters and lack of analysis of gynaecological problems according to age. The study did not



specifically look for underlying heart or neurological disease because the diagnosis requires specialist consultation. The study involves basic evaluation only and additional investigations like lipid profile and ECG will help gather more information on metabolic syndrome and cardiovascular risks which may alter therapy and outcomes in these patients.

## CONCLUSION(S)

Menopause may be a daunting period of a woman's life, complicated by hormonal changes and menopausal symptoms compounded by gynaecological problems. This may be further complicated by weight gain, diabetes, hypertension, and an endless list of medical morbidities. The study highlights the importance of the establishment of dedicated menopausal clinics where gynaecological health, along with common medical problems in elderly females, may be assessed and referral to a specialist may be done, when needed.

## REFERENCES

- [1] Research on the menopause in the 1990s. Report of a WHO Scientific Group. World Health Organ Tech Rep Ser. 1996;866:01-107. PMID: 8942292.
- [2] Kriplani A, Banerjee K. An overview of age of onset of menopause in Northern India. *Maturitas*. 2005;52(3-4):199-204.
- [3] Ahuja M. Age of menopause and determinants of menopause age: A PAN India survey by IMS. *J Midlife Health*. 2016;7(3):126-31. Doi: 10.4103/0976-7800.191012. PMID: 27721640; PMCID: PMC5051232.
- [4] National Family Health Survey 5 (2019-21): Key Insights on Fertility, Reproductive Health Services and Gender. UNFPA. Available from: [https://india.unfpa.org/sites/default/files/pub-pdf/nfhs\\_5\\_key\\_insights.pdf](https://india.unfpa.org/sites/default/files/pub-pdf/nfhs_5_key_insights.pdf).
- [5] Dixit MS, Somalwar S, Tathe GR. Gynecological Problems in Postmenopausal Women: A Hospital-based Study. *J South Asian Feder Menopause Soc*. 2018;6(1):13-16.
- [6] Pertyńska-Marczewska M, Pertyński T. Postmenopausal women in gynecological care. *Prz Menopauzalny*. 2021;20(2):88-98. Doi: 10.5114/pm.2021.107103. Epub 2021 Jun 18. PMID: 34321987; PMCID: PMC8297629.
- [7] ACOG Committee Opinion No. 755: Well-Woman Visit. *Obstetrics Gynecol*. 2018;132(4):e181-e186.
- [8] Xiang D, Liu Y, Zhou S, Zhou E, Wang Y. Protective effects of estrogen on cardiovascular disease mediated by oxidative Stress. *Oxid Med Cell Longev*. 2021;2021:5523516. Doi: 10.1155/2021/5523516. PMID: 34257804; PMCID: PMC8260319.
- [9] Nappi RE, Chedraui P, Lambrinoudaki I, Simoncini T. Menopause: A cardiometabolic transition. *Lancet Diabetes Endocrinol*. 2022;10(6):442-56. Doi: [https://doi.org/10.1016/S2213-8587\(22\)00076-6](https://doi.org/10.1016/S2213-8587(22)00076-6).
- [10] Rajput NH. Menopause: A midlife crisis for women in India. *BMJ Global Health*. 2025;10(6):e017863. Available from: <https://doi.org/10.1136/bmjgh-2024-017863>.
- [11] Ashok BV, Rama AV. A convergent and multidisciplinary integration for research in menopause. *J Midlife Health*. 2022;13(1):05-08. Doi: 10.4103/jmh.jmh\_65\_22. Epub 2022 May 2. PMID: 35707308; PMCID: PMC9190962.
- [12] Unger T, Borghi C, Charchar F, Khan NA, Poulter NR, Prabhakaran D, et al. 2020 International Society of Hypertension Global Hypertension Practice Guidelines. *Hypertension*. 2020;75(6):1334-57. Available from: <https://doi.org/10.1161/HYPERTENSIONAHA.120.15026>.
- [13] American Diabetes Association Professional Practice Committee. 6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes-2025. *Diabetes Care*. 2025;48(Suppl. 1):S128-S145. Available from: <https://doi.org/10.2337/dc25-S006>.
- [14] Baskin HJ, Cobin RH, Duick DS, Gharib H, Guttler RB, Kaplan MM, et al. American Association of Clinical Endocrinologists medical guidelines for clinical practice for the evaluation and treatment of hyperthyroidism and hypothyroidism. *Endocr Pract*. 2002;8(6):457-69.
- [15] Garvey WT, Mechanick JL, Brett EM, Garber AJ, Hurley DL, Jastreboff AM, et al; Reviewers of the AACE/ACE Obesity Clinical Practice Guidelines. American association of clinical endocrinologists and American college of endocrinology comprehensive clinical practice guidelines for medical care of patients with obesity. *Endocr Pract*. 2016;22(Suppl 3):01-203. Doi: 10.4158/EP161365.GL. Epub 2016 May 24. PMID: 27219496.
- [16] Pallikadavath S, Ogollah R, Singh A, Dean T, Dewey A, Stones W. Natural menopause among women below 50 years in India: A population-based study. *Indian J Med Res*. 2016;144(3):366-77. Doi: 10.4103/0971-5916.198676. PMID: 28139535; PMCID: PMC5320842.
- [17] Parihar BC, Tiwari P. Clinical analysis of gynecological diseases in postmenopausal women in tertiary care centre. *Int J Reprod Contracept Obstet Gynecol*. 2018;7(4):1394-99.
- [18] Clarke MA, Long BJ, Del Mar Morillo A, Arbyn M, Bakkum-Gamez JN, Wentzensen N. Association of endometrial cancer risk with postmenopausal bleeding in women: A systematic review and meta-analysis. *JAMA Intern Med*. 2018;178(9):1210-22. Doi: 10.1001/jamainternmed.2018.2820. PMID: 30083701; PMCID: PMC6142981.
- [19] Bobdey S, Sathwara J, Jain A, Balasubramaniam G. Burden of cervical cancer and role of screening in India. *Indian J Med Paediatr Oncol*. 2016;37(4):278-85. Doi: 10.4103/0971-5851.195751. PMID: 28144096; PMCID: PMC5234166.
- [20] Vidya Vasudev, Geetha S, Rejani K, Bharthi M. Histopathological spectrum of lesions in women with postmenopausal bleeding. *Indian Journal of Pathology and Oncology*. 2018;5(2):326-31.
- [21] Mehndiratta N, Sharma S, Sharma RK, Grover S. A prospective study on the incidence of metabolic syndrome in premenopausal and postmenopausal women. *J Midlife Health*. 2020;11(1):17-21.
- [22] Eckel N, Meidtnr K, Kalle-Uhlmann T, Stefan N, Schulze MB. Metabolically healthy obesity and cardiovascular events: A systematic review and meta-analysis. *Eur J Prev Cardiol*. 2016;23(9):956-66. Doi: 10.1177/2047487315623884.
- [23] Benjamin EJ, Virani SS, Callaway CW, Chamberlain AM, Chang AR, Cheng S, et al. Heart disease and stroke statistics-2018 update: A report from the American Heart Association. *Circulation*. 2018;137:e67-e492.
- [24] Patel SA, Winkel M, Ali MK, Narayan KM, Mehta NK. Cardiovascular mortality associated with 5 leading risk factors: National and state preventable fractions estimated from survey data. *Ann Intern Med*. 2015;163(4):245-53.
- [25] Sekhar TV, Medarametla S, Rahman A, Adapa SS. Early Menopause in Type 2 Diabetes - A Study from a South Indian Tertiary Care Centre. *J Clin Diagn Res*. 2015;9(10):OC08-OC10. Doi: 10.7860/JCDR/2015/14181.6628. Epub 2015 Oct 1. PMID: 26557555; PMCID: PMC4625274.
- [26] Panda S, Das A. Analyzing thyroid dysfunction in the climacteric. *J Midlife Health*. 2018;9(3):113-16. Doi: 10.4103/jmh.JMH\_21\_18. PMID: 30294181; PMCID: PMC6166421.

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