Section: Obstetrics and Gynecology

Original Research Article

# DISTRIBUTION AND DETERMINANTS OF MALIGNANCY AMONG PATIENTS WITH POST-MENOPAUSAL BLEEDING

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## ABSTRACT

**Background:** Postmenopausal bleeding (PMB), defined as vaginal bleeding occurring more than 12 months after menopause, is a critical clinical symptom warranting thorough evaluation. The most alarming cause of PMB is genital malignancy, particularly in low-resource settings where screening is limited. This study aimed to evaluate the distribution and determinants of malignancy among patients presenting with PMB. **Materials and Methods:** A prospective observational study was conducted on 100 postmenopausal women presenting with vaginal bleeding. Patients underwent detailed clinical evaluation, transvaginal ultrasonography, Pap smear, and histopathological examination. Based on final diagnosis, patients were categorized into benign (Group A, n = 68) and malignant (Group B, n = 32) groups. Statistical analysis was performed to assess the association of various factors with malignancy. **Result:** Benign causes accounted for 68% of cases, most commonly endometrial polyps (28%) and atrophy (22%). Malignancy was diagnosed in 32% of women, with endometrial cancer (16%), cervical cancer (12%), and ovarian cancer (4%) being the leading diagnoses. Malignancy was significantly associated with rural residence (87.5%, p = 0.000) and high parity (>4 births, p = 0.009). Although age and number of bleeding episodes were not statistically significant, a longer duration since menopause showed a trend toward malignancy (p = 0.054). Endometrial thickness >4 mm was present in all cases of endometrial and ovarian malignancy, while 66.7% of cervical cancer cases had ET ≤4 mm. Risk factors such as obesity (50%), diabetes (56.2%), and hypertension (75%) were notably more common in endometrial cancer cases. **Conclusion:** Genital malignancy was found in nearly one-third of PMB cases, highlighting the importance of prompt evaluation. Rural background, high parity, and metabolic comorbidities significantly increased malignancy risk. ET measurement alone is insufficient—comprehensive assessment including Pap smear and endometrial biopsy is essential in all PMB cases.

## INTRODUCTION

Postmenopausal bleeding (PMB) is defined as vaginal bleeding occurring after 12 months of amenorrhea in a woman of menopausal age and is considered a potential alarm sign for underlying pathology, especially genital malignancies.[1,2] Menopause is a physiological event marked by the permanent cessation of menstruation due to ovarian follicular inactivity. The average age of menopause is 51.4 years in Western populations and around 47–48 years in Indian women.[3-5]

PMB contributes to nearly 5% of all gynecological outpatient consultations and represents a diagnostic challenge requiring a systematic approach.[6] The etiologies of PMB may be benign or malignant and can arise from uterine, extra-uterine, or non-genital sources.[7] Common uterine causes include

endometrial atrophy, polyps, hormone replacement therapy, foreign bodies, trauma, infection, endometrial hyperplasia, and carcinoma.[7,8] Among these, endometrial carcinoma is the most frequently detected genital malignancy in Western countries, accounting for approximately 10% of PMB cases.[9-11] However, due to widespread cervical cancer screening, carcinoma cervix is now rare in postmenopausal women in developed nations. In contrast, it remains a prominent diagnosis in India where many women present with cervical cancer as the cause of postmenopausal bleeding.[11]

Globally, the burden of gynecological malignancies is significant. According to GLOBOCAN 2020, cervical cancer contributed to 604,100 new cases and 341,831 deaths worldwide.[18] In India, cervical cancer accounted for 18.3% of all new cancer cases in women in 2020 (123,907 cases) and remains the second most common malignancy in females after breast cancer.[18,19] The National Cancer Registry Programme (2020) reported that 60% of cervical cancers in India are diagnosed in a locally advanced stage.[20] In addition, the incidence of endometrial and ovarian cancers is rising due to increased life expectancy, changing lifestyle patterns, obesity, and diabetes.[20] While regional cancer registries provide some data, there is limited literature specifically from northern states like Punjab and UT Chandigarh. Given the relatively lower awareness, lack of screening, and delayed reporting in rural populations, the prevalence of undetected genital malignancies, especially carcinoma cervix and endometrium, is likely higher in this region.

The problem lies in the fact that although PMB is often benign, up to 10–15% of cases may harbor genital malignancy.[14] Moreover, most literature has focused predominantly on endometrial cancer, while data on cervical and ovarian malignancies presenting with PMB is sparse. This leads to a diagnostic bias, where non-endometrial malignancies might be underdiagnosed or detected late. In many Indian rural and semi-urban areas, patients often present late due to sociocultural factors, lack of education, or limited access to gynecologic care.

Therefore, this study was undertaken to analyze the distribution and determinants of malignancy in women presenting with PMB in a tertiary care center in north India, specifically in Chandigarh, which caters to both urban and rural populations from Punjab, Haryana, Himachal Pradesh, and surrounding areas. The study aimed not only to estimate the proportion of malignancies but also to identify associated risk factors like parity, obesity, hypertension, diabetes, and rural residency.

Understanding the regional profile of PMB and its malignant causes can help in tailoring local screening strategies, guiding referral systems, and educating frontline healthcare providers. The future implications of this study lie in promoting early detection, universal Pap smear screening, and improving patient outcomes through timely intervention in women at high risk for gynecological cancers.

## MATERIALS AND METHODS

This prospective observational study was conducted over a period of two years in the Department of Obstetrics and Gynecology at Government Medical College and Hospital, Chandigarh. A total of 100 postmenopausal women who presented with vaginal bleeding were included after fulfilling the inclusion and exclusion criteria. Women on hormone replacement therapy, those with premature ovarian insufficiency, or on anticoagulants were excluded from the study. After obtaining written informed consent, detailed history was recorded including menstrual, obstetric, personal, and family history of malignancy. General physical examination was followed by systemic and pelvic examination, including per-speculum evaluation, and Pap smear was taken and reported as per the Bethesda System 2014.

All patients underwent transvaginal ultrasonography (TVS) to assess uterine and adnexal pathology and endometrial thickness. Further evaluation in the form of endometrial aspiration biopsy or fractional curettage was performed in all patients irrespective of endometrial thickness. Cervical biopsy was taken in cases with abnormal Pap smear or visible cervical lesions. In patients where focal lesions were suspected or when no currettings were obtained, diagnostic hysteroscopy was carried out.

The final diagnosis was confirmed by histopathological examination. Patients were then categorized into two groups: Group A included patients with benign causes of postmenopausal bleeding, and Group B included patients with malignant causes. All malignancies were staged according to FIGO classification. Risk factors such as parity, residence (urban/rural), obesity, diabetes, and hypertension were compared between the two groups.

Data were statistically analyzed using SPSS version 10.0. Continuous variables were expressed as mean ± standard deviation and compared using the Student's t-test. Categorical variables were compared using the Chi-square test. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated to assess associations between risk factors and malignancy. A p-value less than 0.05 was considered statistically significant.

## RESULTS

Out of 100 postmenopausal women presenting with vaginal bleeding, 68% had benign causes while 32% were diagnosed with genital malignancies. The most common benign pathologies were endometrial polyps (28%), atrophy (22%), and simple hyperplasia (14%). Among malignant cases, endometrial carcinoma was most frequent (16%),


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followed by cervical cancer (12%) and ovarian cancer (4%).

The mean age of menopause (46.44 vs. 46.38 years) and mean age at presentation (57.74 vs. 59.50 years) showed no significant difference between benign and malignant groups. However, rural residence was significantly associated with malignancy ($p = 0.000$), with 87.5% of malignant cases from rural areas. High parity (>4 births) was also significantly linked to malignancy ($p = 0.009$), whereas lower parity (1–2) was more common in benign cases.

Although the duration since menopause and number of bleeding episodes did not reach statistical significance overall ($p = 0.054$ and 0.394, respectively), a trend toward malignancy was seen in women with bleeding after 16–20 years post-menopause and those with more than 6 bleeding episodes.

Endometrial thickness (ET) >4 mm was present in all cases of endometrial cancer, ovarian cancer, and hyperplasias, whereas 66.7% of cervical cancer cases had ET ≤4 mm, indicating that a thin endometrium does not rule out cervical malignancy.

Regarding risk factors, obesity was observed in 50% of endometrial cancer cases and only 8.7% of benign cases. Diabetes mellitus and chronic hypertension were significantly more common in malignant and premalignant conditions compared to benign ones. All patients with endometrial cancer and premalignant changes had ET >4 mm, reinforcing the role of transvaginal sonography in risk stratification.

These findings emphasize that PMB should never be overlooked, especially in rural, obese, hypertensive, and diabetic women, or those with higher parity. A thorough diagnostic approach including ET assessment, Pap smear, and endometrial biopsy remains essential to detect malignancy at an early, treatable stage.

**Table 1: Demographic and Clinical Variables with Final P Values (n = 100)**

| Variable | Group A (Benign) | Group B (Malignant) | P value |
|---|---|---|---|
| Mean age of menopause (years) | 46.44 | 46.38 | 0.949 |
| Mean age of patient (years) | 57.74 | 59.50 | 0.465 |
| Residence | | | 0.000 |
| – Rural | 32 (47.1%) | 28 (87.5%) | |
| – Urban | 36 (52.9%) | 4 (12.5%) | |
| Parity | | | 0.009 |
| – Parity 0 | 4 (5.9%) | 0 (0.0%) | |
| – Parity 1–2 | 22 (32.4%) | 4 (12.5%) | |
| – Parity 3–4 | 32 (47.1%) | 12 (37.5%) | |
| – Parity >4 | 12 (17.6%) | 14 (43.8%) | |
| Duration since menopause | | | 0.054 |
| – 1–5 years | 22 (32.4%) | 12 (37.5%) | |
| – 6–10 years | 16 (23.5%) | 2 (6.3%) | |
| – 11–15 years | 10 (14.7%) | 6 (18.8%) | |
| – 16–20 years | 6 (8.8%) | 8 (25.0%) | |
| Number of bleeding episodes | | | 0.394 |
| – 1–3 episodes | 32 (47.1%) | 14 (43.8%) | |
| – 4–6 episodes | 24 (35.3%) | 8 (25.0%) | |
| – 7–9 episodes | 8 (11.8%) | 6 (18.8%) | |
| – >9 episodes | 6 (8.8%) | 2 (6.3%) | |

**Table 2: Frequency of Benign and Malignant Causes of PMB (n = 100)**

| Cause | Number (n) | Percentage (%) |
|---|---|---|
| Benign causes | 68 | 68% |
| – Polyp | 28 | 28% |
| – Endometrial Atrophy | 22 | 22% |
| – Simple Hyperplasia | 14 | 14% |
| – Complex Hyperplasia | 4 | 4% |
| Malignant causes | 32 | 32% |
| – Endometrial Cancer | 16 | 16% |
| – Cervical Cancer | 12 | 12% |
| – Ovarian Cancer | 4 | 4% |

**Table 3: Endometrial Thickness Comparison in Malignant and Premalignant Cases (n = 100)**

| ET | Ca Cervix | Ca Endometrium | Ca Ovary | Complex Hyperplasia | Simple Hyperplasia |
|---|---|---|---|---|---|
| ≤4 mm | 8 (66.7%) | 0 (0.0%) | 0 (0.0%) | 0 (0.0%) | 0 (0.0%) |
| >4 mm | 4 (33.3%) | 16 (100.0%) | 4 (100.0%) | 4 (100.0%) | 14 (100.0%) |

**Table 4: Risk Factor Comparison of Ca Endometrium, Premalignant and Benign Conditions (n = 100)**

| Risk Factor | Ca Endometrium (n=16) | Premalignant (n=22) | Benign (n=46) |
|---|---|---|---|
| Nulliparity | 0 (0.0%) | 0 (0.0%) | 4 (8.7%) |
| Late Menopause | 0 (0.0%) | 0 (0.0%) | 0 (0.0%) |
| Obesity | 8 (50.0%) | 0 (0.0%) | 4 (8.7%) |
| Diabetes Mellitus | 9 (56.2%) | 10 (45.5%) | 8 (17.4%) |


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| | | | |
|---|---|---|---|
| Chronic Hypertension | 12 (75.0%) | 12 (54.5%) | 8 (17.4%) |

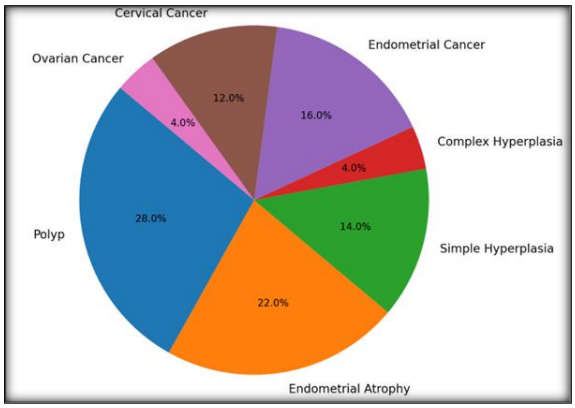


**Figure 1: Distribution of Benign and Malignant Causes of Postmenopausal Bleeding (n = 100)**

## DISCUSSION

Postmenopausal bleeding (PMB) is a significant clinical symptom and must be thoroughly investigated due to its potential association with genital tract malignancies. In the present study of 100 postmenopausal women, 32% were diagnosed with malignancies, a finding considerably higher than the 10–15% range cited in Western literature.[14] This underlines the continuing burden of gynecological cancers in the Indian population, particularly in under-screened and rural populations.

Endometrial carcinoma emerged as the most common malignancy in this cohort, accounting for 16% of cases. This finding aligns closely with previous studies by Siyal et al. and Ubeja et al., who reported incidences of 14.89% and 14% respectively in women with PMB.[15,21] The slightly higher rate in our study could be attributed to the higher proportion of rural and obese patients, along with associated metabolic conditions like diabetes and hypertension.

Cervical carcinoma was responsible for 12% of malignant cases in our study, which is comparable to the 8.8% reported by Ghazi et al. and falls between the higher proportions found by Ubeja et al. (25%) and Asif et al. (25.5%).[15,22,24] The variation reflects regional differences in cervical cancer screening and awareness. The high percentage of cervical cancer cases in our rural cohort (87.5%) and the absence of prior screening in all these patients reaffirm the urgent need for implementation of robust cervical cancer screening programs in underserved populations.

Carcinoma ovary was detected in 4% of cases, consistent with global reports that identify ovarian tumors, particularly hormone-producing ones like granulosa cell tumors, as rare but relevant causes of PMB, accounting for up to 5% of cases [25,26]. Both ovarian cancer cases in this study were overweight, multiparous, and from rural areas, again highlighting the interplay between sociodemographic and metabolic risk factors.

Pap smear proved valuable in preliminary screening, detecting HSIL in 2% of patients, all confirmed later as carcinoma cervix. This is similar to findings by Kaiho et al., who reported cervical dysplasia and carcinoma in 3% and 6% of symptomatic postmenopausal women, respectively.[27] Importantly, 4 additional patients had visible cervical growth, which on biopsy confirmed cervical carcinoma. This underscores the necessity of combining cytological and clinical examination in evaluating PMB.

In our study, endometrial thickness (ET) greater than 4 mm was noted in 72% of patients, including all patients with endometrial carcinoma or premalignant conditions, giving a sensitivity of 100% for detecting endometrial pathology. This finding is supported by studies conducted by Kothapally et al. and Ubeja et al., who also found that ET >4 mm strongly correlated with endometrial malignancy or hyperplasia.[15,28]

The study also explored the prevalence of known risk factors. Obesity, diabetes mellitus, and chronic hypertension were prevalent among patients with endometrial carcinoma, with respective proportions of 50%, 27%, and 37.5%. These findings corroborate the study by Nirupama et al., where 45% of PMB patients with malignancy were obese, and 36% and 13% had hypertension and diabetes respectively.[29] Izetbegovic et al. further confirmed the significance of obesity and diabetes as statistically significant predictors of malignancy in postmenopausal women, emphasizing the need for lifestyle interventions and preventive care.[30]

Cervical cancer in our study was associated with high parity and tobacco use. All patients with carcinoma cervix had parity ≥3 and both smokers in the cohort were diagnosed with the disease. These findings are consistent with established risk factors for cervical malignancy, including high parity, early coitarche, low socioeconomic status, and smoking, as previously highlighted in global cancer burden studies.[18]

## CONCLUSION

This study highlights that 32% of postmenopausal women presenting with bleeding had underlying genital malignancy, with endometrial carcinoma (16%), cervical cancer (12%), and ovarian cancer (4%) being the major causes. While age at menopause and presentation did not differ significantly between benign and malignant groups, rural residence (87.5%) and high parity (>4 births, 43.8%) were significantly associated with malignancy.

A longer duration since menopause and endometrial thickness >4 mm were key indicators of endometrial cancer, while cervical malignancy occurred even with ET ≤4 mm, stressing the need for cervical


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evaluation. Risk factors like obesity, diabetes, and hypertension were more common in malignant cases, especially endometrial cancer.

The findings emphasize that all cases of PMB warrant thorough evaluation, especially in rural, multiparous, and high-risk women. Strengthening screening programs and early diagnostic access is essential to reduce delays and improve outcomes in genital malignancies.

**Limitations:**This study was conducted at a single tertiary care center and may not fully represent the broader community, especially populations with limited access to healthcare. The sample size, though adequate for observational insights, limits subgroup analysis, particularly for less common malignancies like ovarian cancer. Some risk factors such as genetic predisposition, HPV status, and detailed hormonal history (including unopposed estrogen use) could not be evaluated due to exclusion criteria or lack of complete data. Additionally, long-term follow-up to assess treatment outcomes and survival was beyond the scope of this study.

**Recommendations:**All women presenting with postmenopausal bleeding should undergo a standardized diagnostic protocol that includes pelvic examination, Pap smear, transvaginal ultrasound, and endometrial sampling irrespective of endometrial thickness. Awareness campaigns and cervical cancer screening programs should be intensified, especially in rural areas. Routine training of primary healthcare workers to recognize and refer PMB cases early is crucial. Future multicentric studies with larger sample sizes and inclusion of long-term outcomes are recommended to strengthen the evidence and guide region-specific screening strategies.

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