

## A PROSPECTIVE STUDY ON TRANSVAGINAL DOPPLER SONOGRAPHY OF ENDOMETRIUM IN WOMEN WITH POSTMENOPAUSAL BLEEDING.

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**Article Info:** Received 18 October 2019; Accepted 11 November. 2019

**DOI:** <https://doi.org/10.32553/ijmbs.v3i11.715>

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**Conflict of interest:** No conflict of interest.

### Abstract

**Objectives:** This present study was to evaluate the clinical profile and Transvaginal Doppler Sonography findings of endometrium in women with postmenopausal bleeding.

**Methods:** Detail history, clinical examinations and relevant investigations were performed to all cases of PMB. BMI was calculated. Transvaginal sonography of the uterus and Doppler analysis of the blood flow were performed using vaginal probe at 5-7.5 megahertz. Endometrial thicknesses as well as other pathologies in the cavity were noted. Resistive index was calculated.

**Results:** Data was analyzed by using SPSS version 26 software. One sample statistical methods was used. Mean  $\pm$  standard deviation was observed. P-value was taken equal to less than 0.05 for significant differences.

**Conclusions:** Highest prevalence of PMB was seen in women with age greater than 50 years. Most of the cases had BMI 20-25 kg/m<sup>2</sup>. Most of the benign and malignant cases had parity status P3-P4 and P1-P2 respectively. Endometrial thickness of malignant PMB cases was significantly greater than benign PMB cases. Resistive index of malignant PMB women was significantly lower than benign PMB women. Hence, promotion of healthy lifestyles and contraceptives in early reproductive life and awareness for the need of early screening should be recommended to reduce the prevalence of PMB. And early diagnosis and management of post menopausal bleeding are needed for prevention from malignancy.

**Key words:** Postmenopausal Bleeding, Benign, Malignancy, Transvaginal Doppler Sonography.

### Introduction:

Postmenopausal uterine bleeding is as uterine bleeding after permanent cessation of menstruation resulting from loss of ovarian follicular activity [1].

World Health Organization (WHO) defines menopause as cessation of menstruation permanently for a period of more than one year, which is resulted from loss of ovarian activity [2].

Postmenopausal bleeding (PMB) is defined as “any bleeding that occurs from the genital tract after one year of amenorrhea in a woman who is not receiving Hormone Replacement Therapy (HRT)[3].

In India larger population, about 71 million people are over 60 years of age. And postmenopausal women constituted to 43 million, according to the third consensus meeting of Indian Menopause Society (2008). Bleeding per vagina postmenopausally is one of the most common reasons for referral to gynecological department, with a strong suspicion of

malignancy various studies have proven that 90% of the postmenopausal bleed is due to endometrial carcinoma [4], whereas only 10-15% of the women on HRT and having bleed per vagina is diagnosed as endometrial carcinoma. Endometrial cancer is the most common gynecological malignancy in the West, but in India, the incidence rates are low. 80 – 90% of the women have benign conditions like endometrial or cervical polyps, endometrial atrophy, infection, simple endometrial hyperplasia, medical disorders (e.g., liver cirrhosis), decubitus ulcer in cases of uterovaginal prolapse, neglected pessary and forgotten intra uterine device [5].

The pre-test probability (before any test is done) of endometrial cancer in women with PMB is ~10%, but various clinical specifications may alter this proportion, which rises from 1% in women aged <50 years to almost 25% in women aged >80 years. The incidence of cancer is higher in women with PMB and obesity (18%) or with PMB and diabetes (21%). In

obese women with diabetes the incidence may be as high as 29% [6]. Transvaginal sonography (TVS) can reliably assess thickness and morphology of the endometrium and can thus identify a group of women with PMB who have a thin endometrium ( $\leq 4$  mm) and are therefore unlikely to have endometrial cancer. Endometrial sampling is therefore not recommended below this cut-off value [7,8]. Objectives of our study were to evaluate the Transvaginal Doppler Sonography (TVS) study of malignancy of endometrium in patients with post menopausal bleeding.

### Materials and Methods

This present study was conducted in Department of Gynaecology, with the collaboration of Department Radiology, Anugrah Narayan Magadh Medical College, Gaya, Bihar, India during a period from January 2019 to September 2019. Entire subjects signed an informed consent approved by institutional ethical committee of ANMMC, Gaya was sought.

A total of 50 postmenopausal bleeding women were enrolled in this study. Postmenopausal bleeding was defined as women who presented with bleeding after 1 year of amenorrhea. Detail history, clinical examination and relevant investigation were performed to all postmenopausal bleeding women.

### Procedures:

Transvaginal sonography of the uterus and Doppler analysis of the blood flow were performed using vaginal probe at 5-7.5 megahertz. On transvaginal sonography, endometrial thickness as well as other pathologies in the cavity were noted. Transverse and longitudinal sections of the endometrial echoes were obtained and maximal double-layer endometrial thickness in the sagittal plane was measured. Vascularity of the uterus was assessed systematically. Both uterine arteries could be detected in the transverse and longitudinal plane above the supravaginal portion of the cervix. Colour flow images of the uterine arteries were obtained and Doppler signals in the form of flow velocity waveforms displayed. In the velocimetric analysis of flow velocity, waveform determined the resistance index (RI).  $RI = (S-D)/S$ .

S = Maximum systolic velocity.

D = Diastolic velocity.

Body Mass Index was calculated by using a person's weight and height. The formula is  $BMI = \text{Kg/m}^2$ .

A BMI of 25.0 or more is overweight, while the healthy range is 18.5 to 24.9.

### Statistical Analysis

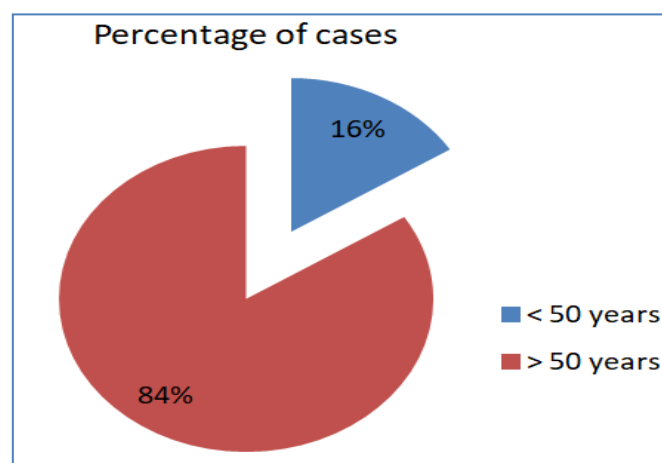
Data was analyzed by using SPSS version 26 software. One sample statistical methods was used. Mean  $\pm$  standard deviation was observed. P-value was taken equal to less than 0.05 for significant differences.

### Observations

In this present study, a total of 50 women with age group 40 years to 80 years of post menopausal bleeding were enrolled. Majorities of cases 18(36%) cases were in age group of 51 years to 60 years.

**Table 1:** Age wise distribution of PMB women.

| Age group | No. of cases | Percentage of cases |
|-----------|--------------|---------------------|
| 40-50     | 8            | 16%                 |
| 51-60     | 18           | 36%                 |
| 61-70     | 14           | 28%                 |
| 71-80     | 10           | 20%                 |
| Total     | 50           | 100%                |



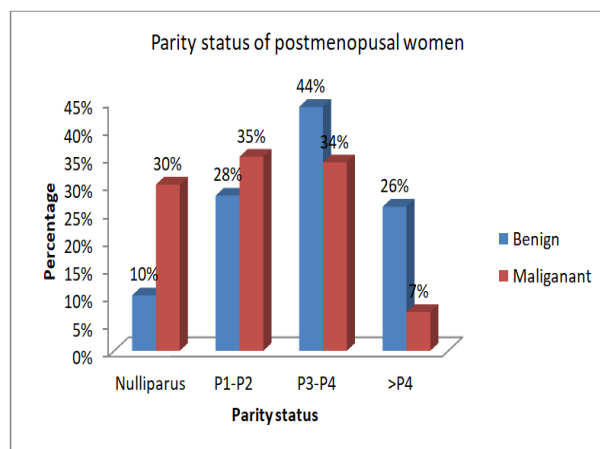
**Figure 1:** Age wise distribution of percentage of PMB cases.

Most of the cases 42(84%) had age group greater than 50 years.

**Table 2:** Body mass index of postmenopausal bleeding women

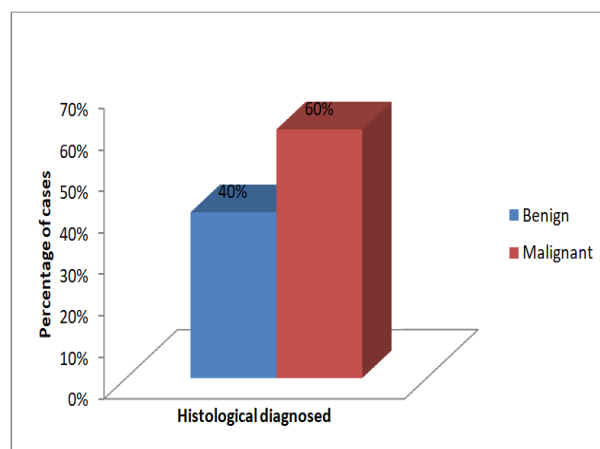
| BMI   | No. of cases | Percentage of cases |
|-------|--------------|---------------------|
| 20-25 | 25           | 50%                 |
| 25-30 | 20           | 40%                 |
| >30   | 5            | 10%                 |

In this study, BMI of most of the cases 25(50%) had 20-25  $\text{Kg/m}^2$ . 20(40%) cases had BMI 25-30  $\text{Kg/m}^2$ .



**Figure 2:** Parity status of postmenopausal bleeding cases.

In this study, out of 20 cases most of the cases 9(44%) of benign post menopausal bleeding had parity status P3-P4. And out of 30 cases most of the malignant post menopausal bleeding 11(35%) had parity status P1-P2.



**Figure 3:** Histological diagnosed cases of malignancy in PMB.

In this present study, on the bases of histological findings 20(40%) women were benign and 30(60%) women were malignant.

**Table 3:** Endometrial thickening of postmenopausal cases.

|           | Endometrial thickening |           |
|-----------|------------------------|-----------|
|           | Mean $\pm$ S.D.        | P – value |
| Benign    | 7.987 $\pm$ 1.424      | 0.000     |
| Malignant | 14.766 $\pm$ 5.051     | 0.000     |

In this present study, mean  $\pm$  S.D. of endometrial thickness of benign women in post menopausal bleeding 7.987 $\pm$ 1.424 and p value was found to be 0.000. This is significantly differenced. Mean  $\pm$  S.D. of malignant PMB women were 14.766  $\pm$  5.051. P value

was found to be 0.000. That was significantly differenced.

**Table 4:** Resistant index

|      | Benign            |           | Malignant         |           |
|------|-------------------|-----------|-------------------|-----------|
|      | Mean $\pm$ S.D.   | P – value | Mean $\pm$ S.D.   | P – value |
| ERI  | 0.730 $\pm$ 0.142 | 0.000     | 0.458 $\pm$ 0.184 | 0.000     |
| LURI | 0.848 $\pm$ 0.149 | 0.000     | 0.662 $\pm$ 0.207 | 0.000     |
| RURI | 0.865 $\pm$ 0.082 | 0.000     | 0.628 $\pm$ 0.158 | 0.000     |

Endometrial Resistive Index (ERI), Left Uterine Artery Resistance Index (LURI) and Right Uterine Artery Resistance Index (RURI) of benign PMB women were 0.730  $\pm$  0.142, 0.848  $\pm$  0.149 and 0.865 $\pm$ 0.082 respectively. And p value was found to be 0.000. That was significantly differenced.

Endometrial Resistive Index (ERI), Left Uterine Artery Resistance Index (LURI) and Right Uterine Artery Resistance Index (RURI) of malignant PMB women were 0.458 $\pm$ 0.184, 0.662 $\pm$ 0.207 and 0.628 $\pm$ 0.158 respectively. And p value was found to be 0.000. That was significantly differenced.

## DISCUSSIONS

Postmenopausal bleeding is a common patient complaint that is encountered by all physicians and other clinicians of gynecologic care. The clinician faces the possibility that there exists an underlying malignancy, while knowing that, in most instances, the bleeding comes from a benign source. Postmenopausal bleeding is a alarming sign that has a high possible of association with the cervical or uterine malignancy. It is one of the commonest symptoms the patient presents with, and hence should be worked up on priority bases to detect abnormalities if any present. We were studied a total number of 50 patients of postmenopausal bleeding women. Highest prevalence 42(84%) was seen in age group of greater than 50 years. Least number 8(16%) was noted in age 40 years-50 years. In age group 50 years to 80 years, most of the cases 18(36%) were seen in age 50 years to 60 years.

A study conducted by Dr. Sreelatha S, et al, [9] on post menopausal bleeding cases and concluded that age group of 40 to44 years had the highest prevalence and the least was noted between the age greater than 70 years. And the study conducted by Wong SF et al, Sousa R et al, Bharani B et al, and Sheikh M et al it varied to 38-94 years, 43-82 years , 52-65 years, 42-84 years respectively [10, 11, 12, 13].

In this present study, on histological findings 20(40%) cases of PMB were benign and 30(60%) cases were malignant. Most of the benign PMB 9(44%) and malignant PMB 11(35%) women had parity P3-P4 and P1-P2 respectively. BMI in majorities of PMB women 25(50%) had 20-25 kg/m<sup>2</sup>. 20(40%) cases had 25-30 kg/m<sup>2</sup>. Least number of cases 5(10%) had BMI >30 kg/m<sup>2</sup>.

Previous studies have shown that obese (BMI >30) women have more risk of PMB [14,15]. Women with abnormal waist-hip ratio had more risk of getting an episode of PMB. Since the waist-hip ratio is less influenced by muscle and bone mass, it is considered as a better indicator for obesity as compared to BMI [16]. In addition, Sindhuri R, et al [17] were found the odds of PMB were high among women who were underweight. However, the link between underweight and PMB could not be understood and needs to be explored further. Adopting for healthy lifestyles such as regular exercise and nutritious and balanced diet might contribute in the prevention of PMB episodes.

The investigation of PMB is relatively straightforward, involving a pelvic ultrasound and tissue biopsy [18,19]. Depending on the findings of physical examination, this biopsy may be from the vulva, vagina or cervix, but most commonly the evaluation needs to include an endometrial biopsy [18,19]. Women should be referred to a gynaecologist for ongoing investigation of PMB [19]. The majority of women referred to outpatient gynaecological services have had pelvic ultrasound in order to evaluate the endometrial thickness and assess for pelvic pathology. Transvaginal ultrasound (TVUS) is considered an acceptable initial investigation in women with PMB[18,20]. In this group of women, as distinct from women with an incidental finding of thickened endometrium or fluid without bleeding, an endometrial thickness of 4–5mm typically correlates with low risk for endometrial disease [21]. As the endometrial thickness increases to 20mm so too does the risk of endometrial cancer [21]. It is important to remember that there is no accepted agreement on the cut-off for normal endometrial thickness and, thus, any women with risk factors and symptoms require endometrial sampling [19].

In this present study, endometrial thickness (Mean  $\pm$  SD) in PMB women with benign was 7.987  $\pm$  1.424 mm and that of malignant was 14.766  $\pm$  5.0518 mm. That was significantly differenced ( $p=0.000$ ). It was

seen that endometrial thickness in PMB women with neoplastic endometrial pathology was significantly higher than that in nonneoplastic endometrial pathology. Endometrial Resistive Index (ERI) of benign and malignant PMB women was 0.730  $\pm$  0.142 and 0.458 $\pm$ 0.184 respectively. Left Uterine Artery Resistance Index (LURI) of benign and malignant PMB women was 0.848  $\pm$  0.149 and 0.662 $\pm$ 0.207 respectively. Right Uterine Artery Resistance Index (RURI) of benign and malignant PMB was 0.865 $\pm$ 0.082 and 0.628 $\pm$ 0.158 respectively. That was significantly differenced ( $p=0.000$ ). It shows that Resistive index was higher in benign PMB women with respect to malignant PMB women.

Endometrial hyperplasia is defined as proliferation of endometrial glands and consequentially an increased gland to stroma ratio [22]. Endometrial hyperplasia can be sub-classified into simple or complex with or without atypia [22]. Curcic, et al.[ 23] concluded that the presence of endometrial fluid detected by TVS is a good marker for pathological changes of the endometrium in postmenopausal women if the endometrial thickness is >4 mm. If the endometrial thickness is <4 mm, the presence of endometrial fluid is not an indication for further invasive investigation procedures.

## CONCLUSIONS

This present study concluded that the highest prevalence of PMB was seen in women with age greater than 50 years. Most of the cases had BMI 20-25 kg/m<sup>2</sup>. Most of the benign and malignant cases had parity status P3-P4 and P1-P2 respectively. Endometrial thickness of malignant PMB women was significantly greater than benign PMB women. Resistive index of malignant PMB women was significantly lower than benign PMB women. Hence, promotion of healthy lifestyles and contraceptives in early reproductive life and awareness for the need of early screening should be recommended to reduce the prevalence of PMB. And early diagnosis and management of post menopausal bleeding are needed for prevention from malignancy.

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