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Evaluation of the Endometrium in Postmenopausal Bleeding by Transvaginal Sonography

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Abstract
Postmenopausal Bleeding (PMB) refers to any vaginal Bleeding in Postmenopausal woman other than expected cyclic Bleeding that occurs with sequential hormone replacement therapy.PMB is generally attributed to endometrial etiology. Transvaginal Sonography (TVS) is primary Imaging modality for the evaluation of the endometrium. The purpose is to evaluate the endometrium in Post-menopausal Bleeding patients by TVS and correlating the findings with histopathology. This study design was a cross-sectional observational study conducted in department of radiodiagnosis at our institute. Sample Size–100 patients with post-menopausal bleeding above the age of 40 years were included. Consent was taken before subjecting them into the study. A detailed history was taken. The patients were then subjected for TVS. Endometrial thickness of 4 mm was used as a cut-off point. Ultrasound data were compared with histopathology. Maximum number of patients were in age group of 40-60 years (82 %). Maximum women(31%) with Post-menopausal Bleeding have parity 3 followed by parity 2. 47 % of women with Post-menopausal Bleeding were in the first 5 years of menopause. Mean of the atrophic Endometrium was 2.5 ± 1 mm and 8.7 ± 4.3 in those with hyperplasia and in endometrial carcinoma, mean of 17.7 ± 10 mm. Every Post-menopausal women with Bleeding should undergo TVS evaluation as it is primary Imaging for the endometrium. In patients with PMB, screening should be done annually in the first 5 years of menopause.
Keywords: *Endometrium, menopause, postmenopausal bleeding, transvaginal sonography.*

Introduction

The term Postmenopausal Bleeding (PMB) refers to any vaginal Bleeding in a Postmenopausal woman other than expected cyclic Bleeding that occurs with sequential hormone replacement therapy (HRT). It can include non-cyclical, excessive, spotting or prolonged Bleeding. The average age at menopause ranges from 45 yrs in the Indian woman to 51 years in the Western population depending on the hereditary, life style and nutritional factors.[1,2,3] A classic teaching has labeled Postmenopausal Bleeding as "Endometrial

cancer until proven otherwise." Transvaginal Sonography (TVS) is simple, non-invasive technique which is used as a primary Imaging modality discriminating between benign and malignant Endometriumand has been explored as an alternative technique to indirectly visualize the Endometrium. The purpose is to evaluate the endometriumin Post-menopausal Bleeding patients by TVS and its correlation with histopathology.

Materials and Methods

This is a cross-sectional observational study conducted in Department of Radiodiagnosis at our Institute. Total 100 Post-menopausal women with complaint of Bleeding per vagina (PV), referred from Gynaecology department to the Department of Radiodiagnosis where included.

Inclusion Criteria

- All patients with complaint of Bleeding PV, after12 months of amenorrhea above the age of 40 years.

Exclusion Criteria

- Perimenopausal women with Bleeding.
- Post-menopausal women with bleeding on hormonal therapy.

Method

All Postmenopausal women who were fulfilling the inclusion criteria and were willing to participate in the study were selected on the basis of purposive sampling. After clinical evaluation by Gynecologist, Patients were informed about the nature and objective of the study. Consent was taken before subjecting them into the study. A detailed history was taken. The patients were then subjected for Transvaginal Sonography. Endometrial thickness of 4 mm was used as a cut-off point. Clinical and Ultrasound data were compared with the final histological diagnosis of the Endometrium, which was obtained by Dilatation and curretage or Hysteroscopic resection or by Hysterectomy.

Statistical Analysis

All collected data were entered into the SPSS version 20 (Statistical package for the social sciences manufactured by IBM) and analysis has been conducted. Continuous data are expressed as mean ± standard deviation form while noncontinuous data are countable and are expressed as percentages or numbers. Continuous data follow both normal distribution and non normal distribution.

Results

There were 100 postmenopausal women with bleeding PV who were included in this study. Maximum number of patients i.e. 82 were in the age group of 40-60 years (82 %). 2 patients (2%) were also found in the age group of 81-85 years(Graph 1).Maximum women (31 %) with Post-menopausal Bleeding have parity 3 followed by parity 2 (Graph 2).

47 % of women with Post-menopausal Bleeding were in the first 5 years of menopause. The percentage then falls gradually to 12 – 15 % thereafter up to 20 years of menopause and 4 % in women with > 25 years of menopause (Graph 3).

The Endometrial thickness of > 4 mm is more common (38 %) in patients with 6-10 years of menopause. The Endometrial thickness gradually falls with increase in duration of menopause (Table 1).

The character of the endometrium including echogenicity, thickness and regularity was studied in patients with endometrial carcinoma and hyperplasia. There is strong correlation of Endometrial carcinoma and thickened and irregular ET. Maximum number of hyperplasia have thickened and regular ET (Table 2).

Echogenicity and thickness were studied in patients with hyperplasia, secretory and proliferative endometrium. (Table 3) In my study, Echogenicity of Endometrium is more related to hyperplasia and secretory phase of Endometrium than proliferative phase.

Majority of the cases (66%) had Endometrial Thickness ≤4 mm followed by >4 mm in 30%.In rest of the 4 patients, hysterectomy was done, so it was not applicable. The cut off value of Endometrial thickness is 4 mm (Table 4).

The endometrial causes of post-menopausal bleeding on histopathology were as in Table 5.

Out of 66 number of patients (66 %) with the Endometrium of <4 mm on TVS, majority of these were atrophic Endometrium (27 cases) on histopathology. In 4 patients out of these 66 patients, hyperplasia was diagnosed on histopathology. Out of these 4 patients, 2 were cystic glandular hyperplasia. Thus hyperplasia was one of the cause of Post-menopausal Bleeding in 4 patients with Endometrium below 4 mm.13 patients with Endometrium <4 mm were lost to follow up.

The Endometriumwas in proliferative and secretoryphase on histopathology in 15 and 7 patients respectively, out 66 patients with Endometrium<4 mm. In 1 patient with normal Endometrium, Endometrial polyp was diagnosed. On TVS the margins of the Endometrium were irregular. However TVS was not able to give definite diagnosis.

In 29 patients with Post-menopausal Bleeding (29 %) with Endometrium > 4 mm, i.e. above the cut off value of 4 mm, 11 patients were diagnosed as carcinoma Endometrium. The Endometrium in these 11 patients were in the range of 10-20 mm. Only 1 patient was having Endometrial thickness of 5 mm which was echogenic and on histopathology came out to be early stage of carcinoma Endometrium. 13 patients were diagnosed as hyperplasia on histopathology. Out of 13 cases of hyperplasia, 4 patients were cystic glandular hyperplasia. Rest of the 3 patients with thickened Endometrium (>4 mm) on TVS, out of which 2 were of inflammatory etiology and 1 was Endometrial polyp, diagnosed on histopathology. 3 thickened Endometrium were in the proliferative phase.

Out of total 29 patients of thickened Endometrium, approx. 40 % of patients had Endometrial carcinoma. Rest of 60 % patients had some other pathology including hyperplasia, endometritis and Endometrial polyp.

So, the atrophic endometrium was the most commonly found in patients with postmenopausal bleeding followed by proliferative phase of endometrium, endometrial hyperplasia, endometrial carcinoma, secretory endometrium, endometrial polyp and endometritis.

In my study, mean of the atrophic Endometrium is 2.5 ± 1 mm and 8.7 ± 4.3 in those with hyperplasia. In case of Endometrial carcinoma, mean of 17.7 ± 10 mm.

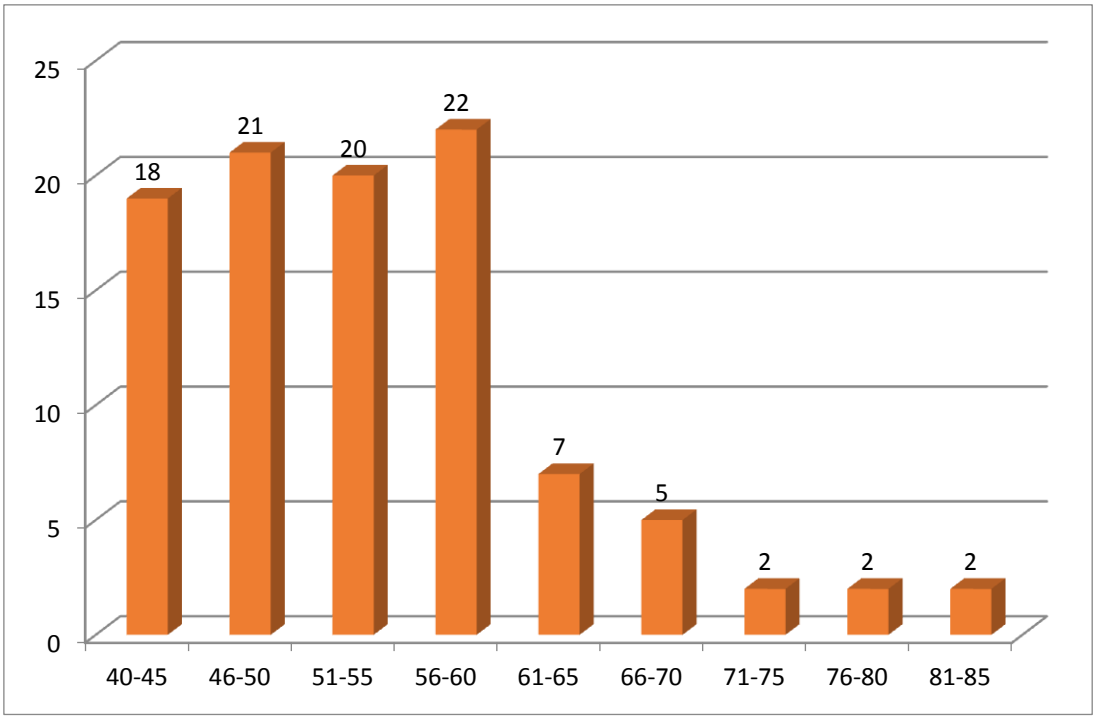

FIG 1: Distribution of patients with Post-menopausal Bleeding according to Age

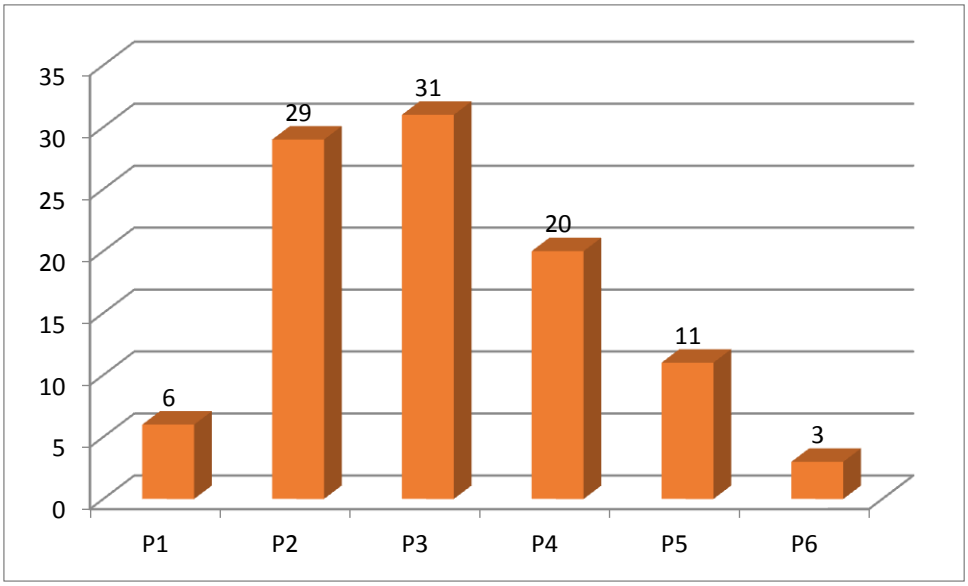

FIG 2: Distribution of patients with Post-menopausal Bleeding according to Parity

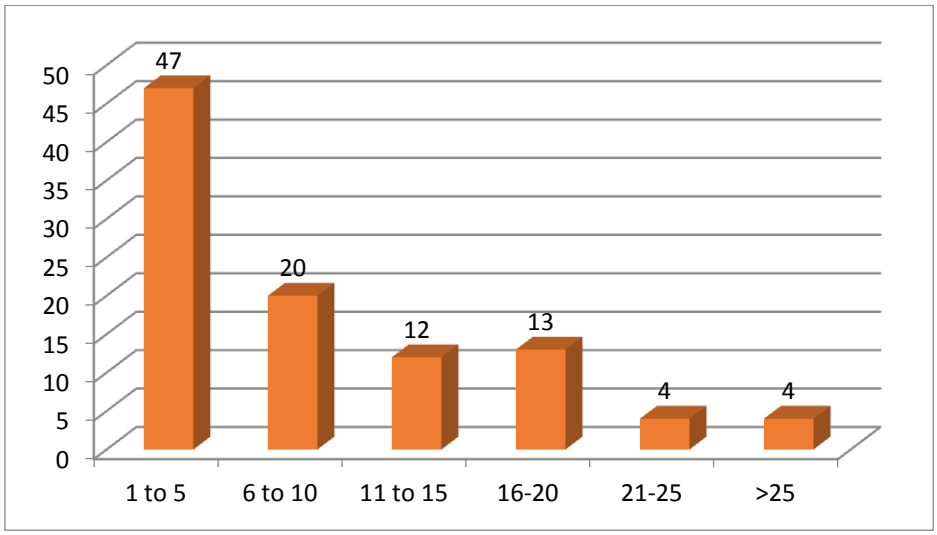

FIG 3: Duration of Menopause of Patients with Post-menopausal Bleeding

DURATION OF MENOPAUSE	N	THICKENED ENDOMETRIUM
1-5	47	**6**
6-10	20	**9**
11-15	12	**4**
16-20	13	**3**
21-25	4	**2**
>25	4	**0**
Total	100	24

FIG 4: Distribution of Thickened Endometrium according to Duration of Menopause

HISTOPATHOLOGY	THICKENED ET		NORMAL ET (≤4 MM)		TOTAL
	REGULAR	**IRREGULAR**	**REGULAR**	**IRREGULAR**	
CA Endometrium	1	10	0	0	**11**
Hyperplasia	12	1	4	0	**17**
Total	13	11	4	0	28

FIG 5 : Distribution of patients with CA Endometrium and Hyperplasia i/v/o Thickness and Irregularity

HISTOPATHOLOGY	THICKENED		NORMAL		TOTAL
	ECHOGENIC	**NORMAL**	**ECHOGENIC**	**NORMAL**	
Hyperplasia	12	1	3	1	**17**
Secretory	0	0	5	2	**7**
Proliferative	**0**	**0**	**3**	**15**	**18**
Total	12	1	10	16	39
p Value	**p>0.05**		p<0.05*		

* p<0.05 – Statistically Significant

FIG 6 : Distribution of patients with Hyperplasia, Secretory& Proliferative Endometrium i/v/o Echogenicity & thickness

ENDOMETRIAL THICKNESS	N	%
≤4 mm	66	**66%**
>4 mm	30	**30%**
NA	4	**4%**
Total	**100**	**100%**

FIG 7 : Distribution of Endometrial thickness of post-menopausal bleeding Patients

ENDOMETRIUM	NUMBER
Atrophic	27
Endometrial Carcinoma	11
Hyperplasia	17
Proliferative	18
Secretory	7
Endometrial Polyp	2
Endometritis	2
Total	84

FIG 8 : Distribution as per histopathological evaluation of endometrium

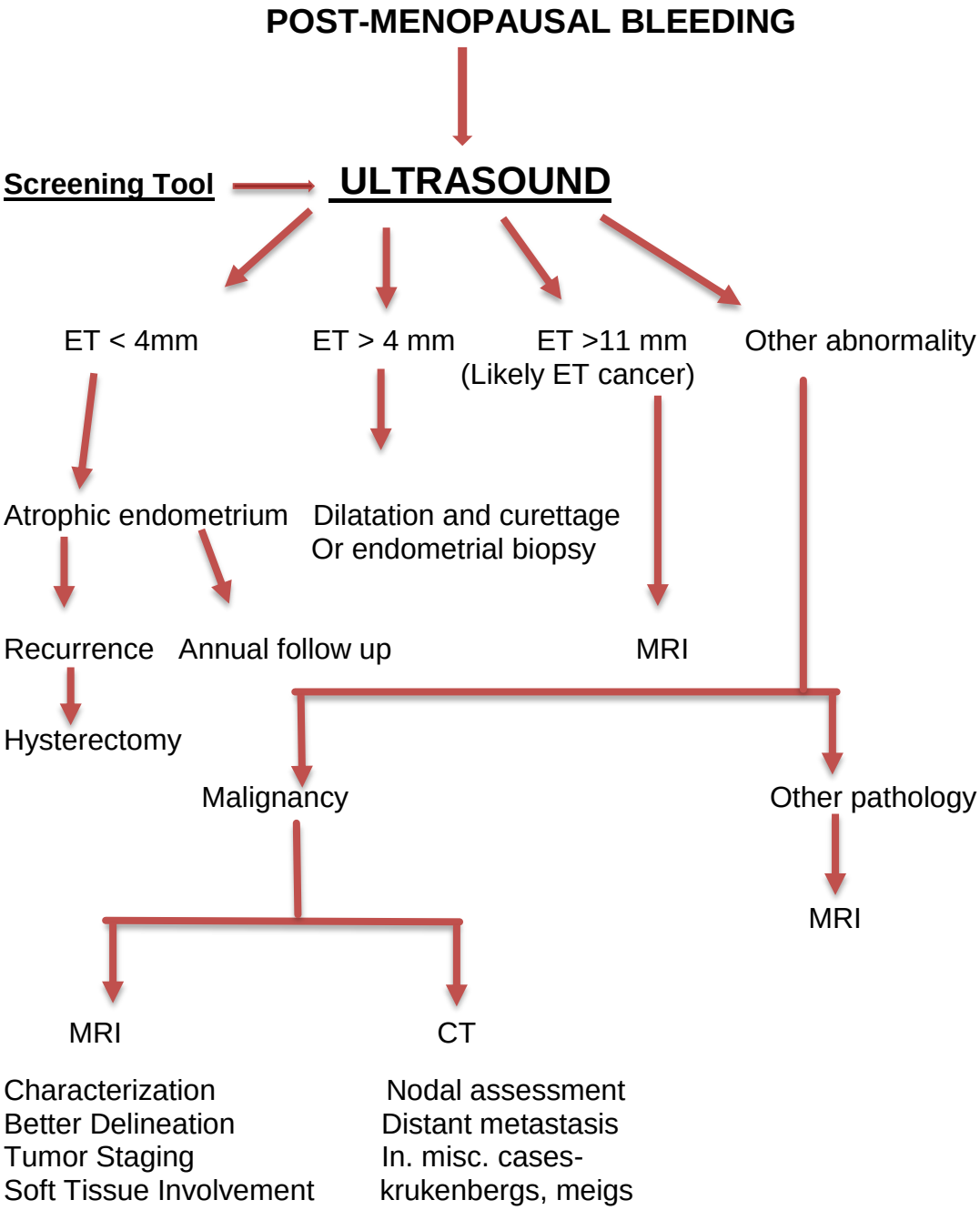

FIG 9 : Flow chart showing USG based approach for Post-Menopausal Bleeding

70 Y, P5L5 ,MS 17 Y PRESENTED WITH BLEEDING SINCE 1 M

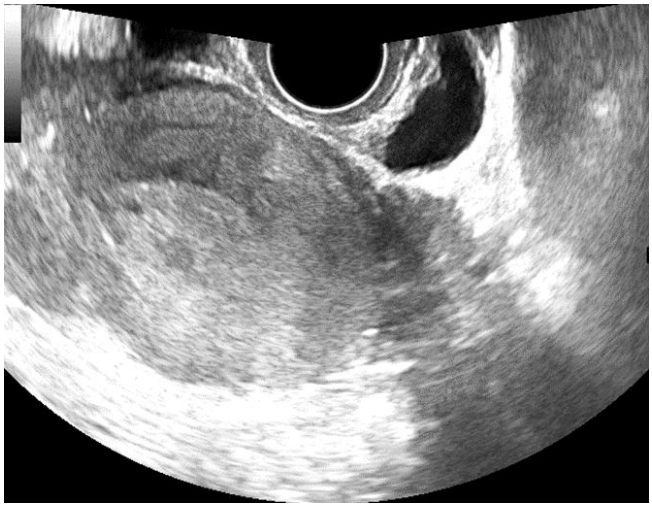

FIG 10: TVS AXIAL section showing heterogeneous lesion involving the endometrium with >2/3rd of myometrial invasion

55 Y, P3L3, MS 12 Y PRESENTED WITH BLEEDING PV SINCE 8 DAYS

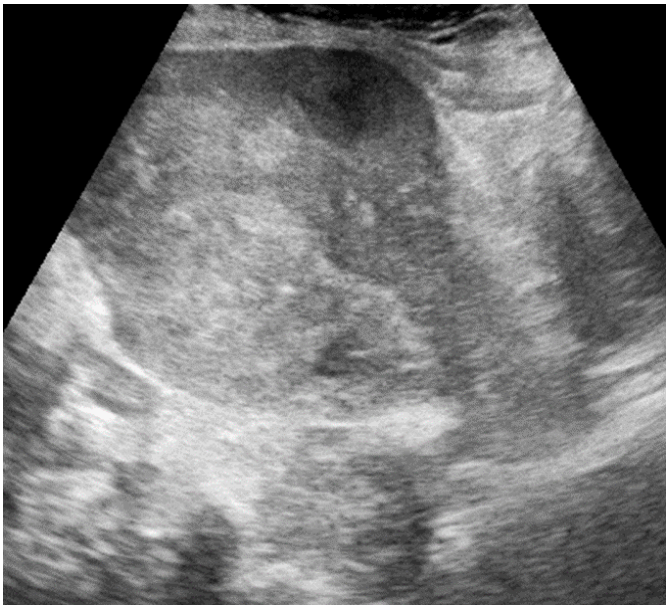

FIG 11: TAS showing thickened and heterogeneous endometrium. Multiple echogenic foci are noted with the myometrium with posterior myometrial thickness more than anterior.

Discussion

In my study, the average age of menopause was 45.5 years. Maximum number of patient's i.e.82 were in the age group of 40-60 years (82 %).

47 % of women with Post-menopausal Bleeding were in the first 5 years of menopause.

In a similar study done by Gamersddin M et al[4] 43%, 30%, 22%, 5% were in the age group of 41-50, 51-60, 61-70, 71-80 years respectively.

Nirupama V et al[5] in a retrospective analysis of 100 cases of Postmenopausal Bleeding observed that the average age of reaching menopause was 48.5 years and in 53% the time of onset of Postmenopausal Bleeding was between 5-10 years after menopause in our study population. The age range of study population was between 45 and 80 years. The peak incidence of malignancy was observed in age group of 55- 70yrs.

The Endometrial thickness of > 4 mm is more common (38 %) in patients with 6-10 years of menopause.

Warming et al[6] noted the decreasing trends in Endometrial thickness with progressive increase in duration of menopause.

In my study, mean of the atrophic Endometrium is 2.5 ± 1 mm and 8.7 ± 4.3 in those with hyperplasia. In case of endometrial carcinoma, mean of 17.7 ± 10 mm. Endometrial cut off was of 4 mm.

Botsis D et al[7] reported that the mean Endometrial thickness in women, examined in their study, with Endometrial cancer was 16.6 ± 5.4 mm as compared with 3.2 ±1.1 mm in those women with atrophic Endometrium, and 9.5 ± 2.3 mm in those with hyperplasia and concluded that, if a cut-off limit of 5 mm had been used in the study, a single case of serious Endometrial pathology would not have been missed.

Guner et al[8] also concluded that Endometrial thickness of <4 mm may serve as cut-off point for predicting pathology negative cases with an accuracy of 100% in Postmenopausal women with or without vaginal Bleeding. Then, as the Endometrial thickness increases, the probability of finding Endometrial pathology in curettage increases linearly with a positive predictive value of 74.6%.

Auslender et al[9] used a cut-off limit of 3 mm and suggested that an Endometrial thickness of 3 mm or less as a threshold would have reduced the number of d&c procedures by 45% and no cases of Endometrial pathologies would have been

missed whereas in our study we have taken Normal ET (≤4 mm).

Conclusion

Post-menopausal Bleeding is more common in 40-60 years of age group. Maximum Post-menopausal Bleeding women were having menopause since 1- 5 years. Most of the Post-menopausal Bleeding women were having parity P2 and P3.There was strong correlation between the thickened and irregular Endometrium and Endometrial carcinoma.Every Post-menopausal women with Bleeding should undergo Transvaginal Sonography evaluation as it is primary Imaging modality for the endometrium which can detect any abnormality if present.In patients with Post-menopausal Bleeding, screening should be done annually in the first 5 years of menopause. After that, once in 2 years up to 20 years of menopause. Thereafter, screening should be done every 5 years, in patients with duration of menopause > 20 years.

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