INTRODUCTION

The WHO defines menopause as the permanent cessation of menstruation resulting from the loss of ovarian follicular activity. However, for purpose of guidelines, an episode of bleeding 12 months after the last menstrual period will be deemed to constitute post-menopausal bleeding (PMB). The incidence of abnormal uterine bleeding is 10% to 15% in post-menopausal women. Using of hormonal replacement therapy is often associated with endometrial bleeding. Obesity affects many of the squeal of menopause. The ovarian-hypothalamic-pituitary axis

ABSTRACT

Background: Postmenopausal bleeding is defined as permanent cessation of menstruation resulting from the loss of ovarian follicular activity. Incidence of abnormal uterine bleeding is 10% to 15% in postmenopausal bleeding. For evaluation of postmenopausal bleeding earlier dilatation and curettage was considered as gold standard which is a blind procedure, transvaginal sonography has improved the accuracy of endometrial morphology. Now the focus has shifted to hysteroscopic guided biopsy which is gold standard for evaluating postmenopausal bleeding it also has benefit of see and treat modality. The objective of this study was to study the significance of hysteroscopy in diagnosis of etiopathological factors of postmenopausal bleeding. To correlate the diagnosis by TVS, hysteroscopy and histopathological diagnosis.

Methods: The study was conducted at Dr. D. Y. Patil Medical College and Hospital from June 2016 to September 2018. A total of 30 cases were evaluated. The commencement of the study was followed by approval of the institutional ethical committee.

Results: In our study, 83.34% of patients with postmenopausal bleeding where in age group menopause is >55 years. 66.67% are overweight with BMI of 25-29.9. We evaluated the ET <4 mm, 4-12 mm, >12 mm thickness, 53.33% were between 4-12 mm of ET. In our study endometrial hyperplasia shows 30% in hysteroscopy, on HPE shows 33.33%, in atrophic endometrium 20% on HPE is also 20%, polyp shows 6.67% in both hysteroscopy and HPE, sub mucous myoma on both hysteroscopy and HPE shows 3.33% and Ca endometrium shows 3.33% in both hysteroscopy and HPE.

Conclusions: Study of total 30 cases were conducted, by using Bettochi Office hysteroscope (2.9 mm). Sensitivity, specificity, positive predictive value and negative predictive value of hysteroscopy was calculated in each group of patients.

Keywords: Endometrial hyperplasia, Hysteroscopy, Polyp., Postmenopausal bleeding, Uterine cavity
remains intact during the menopausal transition; thus, FSH levels rise in response to ovarian failure and the absence of negative feedback from the ovary. Menopausal transition or perimenopause is a defined period of time beginning with the onset of irregular menstrual cycles until the last menstrual period, and is marked by fluctuations in reproductive hormones. Accurate diagnosis is required for which there are different methodologies by which evaluation can be done. They are the following:

- **Dilatation and curettage:** blind method, very low sensitivity and specificity
- **Transvaginal sonography (TVS):** directly visualize other causes of postmenopausal bleeding such as polyps, myomas and endometrial atrophies
- **Saline infusion sonography (SIS)**
- **Three-dimensional ultrasound**
- **Magnetic resonance imaging (MRI)**
- **Hysteroscopy:** Evaluation of postmenopausal bleeding by this technique has scored over all because of its highest specificity and sensitivity, which has become the gold standard procedure.

**METHODS**

The study was conducted in Dr. D.Y. Patil Medical College and Hospital from June 2016 to September 2018. A total of 30 cases were evaluated. The commencement of the study was followed by approval of the institutional ethical committee. A written informed consent was taken from the patient for the procedure and was duly explained to the patient.

**Inclusion criteria**

- Postmenopausal women who had their last menstrual period at least 1 year before.
- All patients of PMB will be subjected to TVS for endometrial thickness will be divided into
  - a. Group 1 (ET <4 mm)
  - b. Group 2 (ET >4 mm).

**Exclusion criteria**

- Women taking hormonal replacement therapy (HRT)
- Known case of bleeding dyscrasia
- Anticoagulant menopause
- Surgical menopause
- TVS showing adnexal pathology.

Detailed history of patient including age, weight, basal metabolic index, menstrual and obstetric history, duration since menopause, severity and duration of postmenopausal bleeding, history of gynecologic operations, drug intake and associated symptoms.

General and systemic examination with abdominal, vaginal and rectal examinations. Duration and severity of bleeding and whether it's related to trauma or intercourse.

Women taking tamoxifen for treatment of breast cancer. Presence of obesity, diabetes and tamoxifen use should be noticed as obesity increases the risk of endometrial cancer and overweight women has increased risk of conversion of steroid to estrogen in their peripheral fat and reduced sex hormone binding globulin. Diabetes is associated with risk of endometrial cancer. Laboratory investigations - haemogram and blood group, ESR, BSL, Thyroid profile, urine routine microscopy, HIV, HBsAg, VDRL

**Special investigations viz**

- Ultrasonography-to exclude extra pelvic masses or any other pathology.
- Transvaginal ultrasonography-all patients of PMB will be subjected to a TVS. It will be measured as the maximum distance between two myometrial interfaces on longitudinal scan, if free fluid will be present in endometrial cavity, its measurement will be subtracted from the total. Endometrial carcinomas typically present as thickening of the endometrium and TVS diagnosis of endometrial cancer is based on endometrial thickness that is measured in the anteroposterior dimension. Compared with premenopausal women, the measured thickness of the endometrium (by convention a double layer in the midsagittal view, should be thinner in postmenopausal women not receiving HRT. This double-thickness layer is called the EEC (Endometrial Echo Complex). A study by conoscenti et al, transvaginal sonography showed sensitivity and specificity, positive predictive and negative predictive value of 55%, 96.1%, 68.75% and 93.2% respectively in detecting pre-malignant and malignant endometrial pathology.

- Hysteroscopy will be performed after TVS in all patients with a 5 mm, continuous flow diagnostic office hysteroscope with 2.9 mm rod lens (Bettocchi office hysteroscope, Karl Stroz, Tuttingen, Germany). The vaginoscope approach without speculum or tenaculum was used in all the patient to avoid discomfort or pain. The uterine cavity will be distended with normal saline solution. Intrauterine pressure will be automatically controlled by an electronic irrigation suction device (Endomat, Karl Stroz). Specimen for endometrial guided biopsy will be obtained with a 5f crocodile biopsy forceps forceps that up to 5.7 mm² of endometrial tissue. Endometrial and cervical polyps will be treated during the same procedure.

**Statistical analysis**

The results of hysteroscopy were recorded on a prescribed proforma systematically under following Ostita, Cervix, Cervical canal, Endometrium - Atrophy, Submucousmyomas, Focal adenocarcinomas, polyp. Statistical differences between the proportions were
tested by chi square test or Fisher’s exact test. 'p’ value less than 0.05 was considered statistically significant.

RESULTS

The case study was conducted at Dr. D. Y. Patil Medical College, Hospital and Research centre, Pimpri, Pune from June 2016 to September 2018. A total of 30 cases of postmenopausal bleeding fulfilling the inclusion criteria were enrolled.

A total number of 30 cases were evaluated and 66.67% of patients were belonged to age group >55 years.

The age of menopause is an important determinant in patients who presents with postmenopausal bleeding, in our study, 83.34% of patients had postmenopausal bleeding where age of menopause is >55 years.

The higher the parity, the lesser the risk of malignancy, there was no significant difference in primiparous and multiparous in our study, primipara was 53.33%, multiparous was 46.67%.

Excessive weight, obesity is an important co-morbid risk factor in patients of postmenopausal bleeding, 66.67% are overweight with BMI of 25-29.9.

Diabetes mellitus, hypertension, hypothyroidism are metabolic disorders whose association with postmenopausal bleeding can bring about an increased risk of uterine malignancy in our study. 86.67% patients had no coexisting co-morbidity associated postmenopausal bleeding in the form of diabetes mellitus, hypertension, hypothyroidism and obesity.

<table>
<thead>
<tr>
<th>Table 1: Endometrial thickness on TVS.</th>
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<tbody>
<tr>
<td>ET on TVS (mm)</td>
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<tr>
<td>&lt;4</td>
</tr>
<tr>
<td>4-12</td>
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<tr>
<td>&gt;12</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

In Table 1, we evaluated the ET <4 mm, 4-12 mm, >12 mm thickness, and a large majority of cases, i.e 53.33% were between 4-12 mm of ET.

TVS is a non-invasive technique of determining the probable cause of postmenopausal bleeding. The thickness and the possibility of any other endometrial pathology can be identified by this technique.

Though an accurate assessment and diagnosis may not be achieved by TVS, atrophic endometrium accounts for 30%, endometrial hyperplasia accounts for 20%, polyp accounts for 10%, submucous myoma accounts for 6.67%, and ca endometrium accounts for 3.33% as shown in Table 2.

<table>
<thead>
<tr>
<th>Table 2: TVS findings and incidence of suspicious pathology.</th>
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<tbody>
<tr>
<td>TVS findings</td>
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<tr>
<td>Atrophic endometrium</td>
</tr>
<tr>
<td>Endometrium hyperplasia</td>
</tr>
<tr>
<td>Polyp</td>
</tr>
<tr>
<td>Submucous myoma</td>
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<tr>
<td>Ca endometrium</td>
</tr>
</tbody>
</table>

Hysteroscopy clinches the diagnosis as seen in table above, endometrial hyperplasia was seen in 30% as a leading cause of postmenopausal bleeding followed by atrophic endometrium which was seen in 20% cases. In our study Ca endometrium accounted for 3.33% was seen in only 1 case.

<table>
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<th>Table 3: Hysteroscopy findings.</th>
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<tr>
<td>Hysteroscopy findings</td>
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<tr>
<td>Atrophic endometrium</td>
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<tr>
<td>Endometrium hyperplasia</td>
</tr>
<tr>
<td>Polyp</td>
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<tr>
<td>Submucousmyoma</td>
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<tr>
<td>Ca endometrium</td>
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</tbody>
</table>

In Table 4 however, the confirmation is done by histopathology here again endometrium hyperplasia was seen in 33.33% cases followed by atrophic endometrium in 20%, polyp in 6.67%, submucous myoma in 3.33% cases and ca endometrium in 3.34% cases.

<table>
<thead>
<tr>
<th>Table 4: Histopathological findings.</th>
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<tr>
<td>HPE finding</td>
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<tr>
<td>Atrophic endometrium</td>
</tr>
<tr>
<td>Endometrium hyperplasia</td>
</tr>
<tr>
<td>Polyp</td>
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<tr>
<td>Submucous myoma</td>
</tr>
<tr>
<td>Ca endometrium</td>
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</tbody>
</table>

Comparing the modalities of diagnosing postmenopausal as seen in Table 5, the HPE and hysteroscopic findings conquered with each other in patients of endometrial hyperplasia 30% on hysteroscopy while on HPE 33.33%, in atrophic endometrium 20% on HPE is also 20% on
hysteroscopy, polyp shows 6.67% in both hysteroscopy and HPE, on sub mucous myoma both hysteroscopy and HPE shows 3.33% and Ca endometrium shows 3.33% in both hysteroscopy and HPE, while TVS and hysteroscopy findings did not correlate well as shown in Table 5.

Table 6: Sensitivity and specificity of TVS and hysteroscopy for diagnosing endometrial pathologies.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>TVS</th>
<th>Hysteroscopy</th>
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<tbody>
<tr>
<td></td>
<td>Sensitivity (%)</td>
<td>Specificity (%)</td>
</tr>
<tr>
<td>Atrophic endometrium</td>
<td>83.33</td>
<td>83.33</td>
</tr>
<tr>
<td>Endometrium hyperplasia</td>
<td>66.67</td>
<td>100</td>
</tr>
<tr>
<td>Polyp</td>
<td>100</td>
<td>96.55</td>
</tr>
<tr>
<td>Submucous myoma</td>
<td>100</td>
<td>96.55</td>
</tr>
<tr>
<td>Ca endometrium</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

To adjudge, which is the best modality for diagnosing the postmenopausal bleeding the Table 6 shows the sensitivity and specificity of hysteroscopy and TVS in diagnosing endometrial pathology.

In our study, as seen in above table the specificity of TVS in diagnosing all the pathologies is much lower than as compared to hysteroscopy. The specificity was only 83.33% atrophic endometrium. TVS being a non-invasive, cost-effective technique can be considered to be used as a screening tool in patients who are menopausal.

DISCUSSION

The study was conducted at Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune from June 2016 to September 2018. A total of 30 cases were evaluated for the role of hysteroscopy in postmenopausal bleeding, who attended the outpatient department fulfilling the inclusion criteria. In today’s era of technological advancements a “see and treat” concept is preferred.

Hysteroscopic advancements and instrumentation has gained momentum by leaps and bounds, to an extent that it may replace the conventional pelvic examination. All women with thickness of 4 mm are less likely to have endometrial cancer.5,8

In our study 83.34% of patients had postmenopausal bleeding where age of menopause was >55 years.

A study conducted by Rekha B et al revealed that 36% of cases belonged to more than 55 years of age.9 The higher the age of menopause, can cause a prolonged period of exposure to estrogen which could result in increased incidence of endometrial pathologies.

In our study, 53.33% of patients were primipara and 46.67% were multipara. Pregnancy has a protective effect on endometrium and prevents continuous unopposed action of estrogen.

A study conducted by Rekha B et al in 88% of patients were multiparous which was much higher than our study.9

Excessive weight, obesity is an important co-morbid risk factor in patients of postmenopausal bleeding. In our study, patients having a BMI between 25-29.9 were 66.67%. In obese patients, there is peripheral conversion of androgen to estrogen, which creates an estrogen microenvironment bringing about a continuous action of glandular proliferation on endometrium. This may act as a precursor to development of endometrial cancer.

A study was done by Fatima SS et al, depicted 72.7% of patients having a BMI of more than 30. This was significantly higher as compared to 10% in our study.10

TVS is a non-invasive technique of determining the probable cause of postmenopausal bleeding. The endometrium thickness when measured in sagittal view can hint about or possibility of any endometrial pathology. It is a good measure and tool to predict any endometrial abnormality.

It has been consensus that when ET <4 mm have a lesser probability of having endometrial cancer.

In our study, we evaluated the ET <4 mm, 4-12 mm, >12 mm thickness. And a large majority of cases i.e. 53.33% were between 4-12 mm of ET.

In 2011, study by Tandulwadkar et al, showed 58.3% cases had an ET between 5-12 mm on TVS which correlated well with our study.11

Our study showed a sensitivity and specificity of 100% as compared to Tandulwadkar et al, which showed a sensitivity of 93.75%.

The study is comparable to Trajano et al, who also had a sensitivity of 100% in atrophic endometrium and specificity of 98% in atrophic endometrium; these results
were also similar in case of polyps, myomas and Ca endometrium.12

The sensitivity and specificity in diagnosing pathologies with TVS ranging from 83.3% to 100% respectively in various pathologies, this means that it is a good marker in patients of postmenopausal bleeding and the specificity is definitely lower than hysteroscopy because it allows to evaluate all the uterine walls and delineate all the focal pathology in the endometrium.

Our study showed a sensitivity and specificity of 100% as compared to Tandulwadkar et al, which showed a sensitivity of 93.75%.11

Hysteroscopy definitely scores over TVS in diagnosing and office hysteroscopy helps in reducing the cost of the procedure too. Hysteroscopy also is dependent on the skill of the surgeon and therefore, the confirmation must be done by histopathology.

CONCLUSION

We understand that higher the age of menopause higher the risk of cancer in such a situation ET on TVS serves as a good screening test in patients of postmenopausal bleeding. The sensitivity and specificity of ultrasound though is low because of its limitations related to skilled radiologists and thickness of uterine wall. Hence, hysteroscopy can be considered as a gold standard in the diagnosis of postmenopausal bleeding and should be done in every patients who comes with postmenopausal bleeding. The sensitivity and specificity of hysteroscopy for atrophic endometrium(83.33%,95.83%),endometrial hyperplasia (90%, 100%), polyp (100%, 100%), submucousmyoma (100%, 100%), Ca endometrium (100%, 100%), because it can visualize all the uterine walls, diagnose even more small focal areas of hyperplasia, polyps and even malignancy in polyps and serves as a see and treat modality. Histopathological evaluation must be done to confirm the findings of hysteroscopy.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES


