Original Article

Correlation between Endometrial Thickness in Transvaginal Sonography and Histopathological Findings in Women with Abnormal Uterine Bleeding

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Abstract: Abnormal uterine bleeding (AUB) is described as abnormality in cycle regularity (irregular, regular or absent), frequency (frequent, normal or infrequent/ 24-38 days), duration (prolonged, normal or shortened/ 4-8 days), heaviness of each bleeding episodes (heavy, normal or light/ 4-80 ml). This study correlated the endometrial thickness by transvaginal ultrasonography with histopathological pattern in women aged ≥40 years presenting with abnormal uterine bleeding. This was a prospective study done in women aged ≥40 years presenting with abnormal uterine bleeding. The study was conducted in N=37 women in 1 year duration. Transvaginal sonography was done to measure endometrial thickness and endometrial biopsy was taken and sent for histopathological examination. Histopathological reports were reviewed and analysis done with EPI info software. The most common age group presenting with AUB was 40-49 years in 22 women (60%). Total 16 women (43.2%) had endometrial thickness of 5-9.9mm and ≥10mm in 10 women (27.0%) in TVS finding. The histopathological findings showed that proliferative endometrium was most commonly seen i.e. in 17 women (45.9%) and endometrial carcinoma was seen in 3 women (8.1%). The most common clinical presentation was menorrhagia in 18 women (48.6%) and least common was oligomenorrhea in 1 woman (2.7%). The correlation of TVS and HPE finding in this study showed that there is significant positive correlation between endometrial thickness in TVS and histopathological examination, r = .512 and p-value is. 001.Transvaginal sonography is a tool for the evaluation of AUB as an initial procedure. Endometrial biopsy is a procedure for histological evaluation of the endometrium and remains the standard diagnostic procedure for the assessment of abnormal uterine bleeding. In women with AUB, they are useful tools to identify various histopathological finding like endometrial carcinoma. Thus, sonography with histological assessment of the endometrium is the corner stone for diagnosis and for further management.

Keywords: abnormal uterine bleeding, endometrial biopsy, histopathology, transvaginal sonography

1. INTRODUCTION

Abnormal uterine bleeding (AUB) is described as abnormality in cycle regularity (irregular, regular or absent), frequency (frequent, normal or infrequent/ 24-38 days), duration (prolonged, normal or shortened/ 4-8 days), heaviness of each bleeding episodes (heavy, normal or light/ 4-80 ml) [1]. This is one of the symptoms caused by many conditions [2]. AUB is one of the common conditions affecting otherwise healthy women at all ages and interferes with women's physical, emotional and social quality of life. It is important to reach correct clinical diagnosis and identify the causative factor [3,4]. Menstrual problems account for much of the morbidity, affecting one in every five women during their life span [5]. Menstrual bleeding occurs from the endometrium in AUB and this endometrium is a dynamic, hormonally sensitive and responsive tissue, which constantly and rhythmically undergoes changes in the active reproductive life [4]. It undergoes a plethora of changes, by the complex interplay of endogenous sex steroids and other systemic as well as iatrogenic factors [6]. A normal menstrual cycle starts when Pituitary Follicle Stimulating Hormone (FSH) induces ovarian follicles to produce oestrogens. Estrogen stimulates proliferation of the endometrium thus resulting in proliferative endometrium. During midcycle, Luteinizing Hormone (LH) surge prompts ovulation forming corpus luteum which produce progesterone and induce a secretory endometrium. Endometrial thickness increased rapidly during the follicular phase and then showed little change from the ovulatory phase through to the luteal phase [7]. In the absence of pregnancy, estrogen and progesterone levels decline and withdrawal bleeding occurs in 14 days post ovulation. Any disruption in the normal physiology and anatomic changes in the endometrium results in AUB.As the regular endometrial cycle follows a precisely scheduled series of morphological changes, there are wide range of diagnostic possibilities in the evaluation of women who present with AUB [6]. A woman's first menstrual bleeding is menarche. Menarche typically occurs at median age between 12 years and 13 years, within 2–3 years after thelarche (breast budding), at Tanner stage IV breast development. By age 15 years, 98% of females will have had menarche [8]. Perimenopause is the period beginning with menopausal transition and ending 12 months after the last menstrual period as stated by the Stages of Reproductive Aging Workshop (STRAW), 2001. This may last for 4-8 years [9]. The late reproductive stage marks the time when fecundability begins to decline and during which a woman may begin to notice changes in her menstrual cycles. Early menopausal transition is marked by increased variability in menstrual cycle length, defined as a persistent difference of 7 days or more in the length of consecutive cycles. Persistence is defined as recurrence within 10 cycles of the first variable length cycle. The late menopausal transition is marked by the occurrence of amenorrhea of 60 days or longer. Menstrual cycles in the late menopausal transition are characterized by increased variability in cycle length, extreme fluctuations in hormonal levels, and increased prevalence of anovulation. This stage is estimated to last, on average, 1 to 3 years [10]. During this period, the endocrinological, biological and clinical features of approaching menopause commence. The perimenopause is often characterised by menstrual cycle irregularities in frequency and volume, due to fluctuating oestrogen levels. These changes are unpredictable and are unique for each woman. Although irregular bleeding patterns are a normal and expected part of perimenopause, the incidence of uterine pathology and associated medical complications also increase in this age group. Of equal importance is the impact of this abnormal blood loss on the quality of the woman's life. Long anovulatory periods with unopposed oestrogen stimulation may result in endometrial hyperplasia, thus increasing the risk of endometrial cancers. Therefore, AUB in the perimenopausal period assumes significance [9]. Nearly 40% of premenopausal women with endometrial carcinoma will present with menorrhagia as their only complaint. AUB in the form of postmenopausal bleeding is an important symptom not to be underestimated. It is an alarming symptom that indicates malignancy until proved otherwise and therefore, requires prompt histopathological evaluation to eliminate possibility of malignancy [6]. The

highest incidence of AUB is in the perimenopausal age group (41-50 years) [4]. Menopause is the permanent cessation of menstruation resulting from the loss of ovarian follicular activity. Bleeding that occurs 12 months after the last menstrual period is labelled as postmenopausal bleeding. Approximately, 3 % of menopausal women suffer from this condition and require prompt and thorough evaluation. The primary aim was to rule out endometrial pathology (carcinoma and atypical hyperplasia) [11]. In most cases, non-neoplastic conditions are identified as cause for AUB such as normal endometrium. However, endometrial carcinoma is one of the most common malignancies of the female genital tract and is often preceded by a histologically evident precursor lesion, "hyperplasia" [6]. Postmenopausal vaginal bleeding usually is caused by atrophic changes of the vagina or endometrium [12]. But vaginal bleeding is the presenting sign in more than 90% of postmenopausal women with endometrial carcinoma. Malignancy was most commonly found in postmenopausal age group patients in comparison to premenopausal patients [13]. AUB accounts for about 70% of all gynaecologic outpatient visits in the perimenopausal women [9]. Abnormal uterine bleeding (AUB) affects 10-30% of reproductive-aged women and up to 50% of perimenopausal women [4]. In UK, AUB accounts for 5% of referrals to General Practitioners and 12 % of all new gynaecological referrals [14]. In gynaecology outpatient department at Kamla Nehru Hospital, Indira Gandhi Medical College, Shimla, 17.09% presented with complaints of AUB with perimenopausal bleeding in 1.41% and post-menopausal bleeding in 0.62% [15]. Prevalence of abnormal uterine bleeding was found to be 4.7% in Chitwan Medical College, Chitwan, Nepal [16]. The incidence of spontaneous postmenopausal bleeding in the general population is approximately 10% immediately after menopause, and 5% in all menopausal women. Endometrial cancer is the most common gynaecological malignancy and the fourth most frequent site of malignant neoplasm in females. Endometrial cancer comprises only 1.9% of all types of cancer in increasing trend along with the average lifespan [17]. Most cases of uterine cancer (92%) occur in the endometrium and are referred to as endometrial cancer. Depending on age and risk factors, 1–14% of women with postmenopausal bleeding will have endometrial cancer. [12] Endometrial cancer has a world-wide incidence of 9 per 100 000 women, with a 1% lifetime risk. Most cases are in women aged >50 years [18]. The incidence of endometrial hyperplasia and endometrial carcinoma were more common in the perimenopausal and postmenopausal women [19]. Although endometrial cancer is primarily a disease of postmenopausal women, up to 14% of those afflicted are premenopausal [20]. As mentioned, there is increased risk of endometrial hyperplasia and endometrial carcinoma in premenopausal and postmenopausal women with abnormal uterine bleeding [21]. Unopposed oestrogen exposure is a significant risk factor, where prolonged exposure causes continual endometrial proliferation and, potentially, endometrial carcinoma. Other factors influencing oestrogen exposure include obesity, polycystic ovarian syndrome (PCOS), anovulation, nulliparity, and type 2 diabetes mellitus and these are also thought to increase the risk of endometrial cancer. Endometrial hyperplasia, that is, irregular proliferation of the endometrial glands, may, in some cases, be a precursor to endometrial cancer. ‘Atypical’ hyperplasia poses the highest risk and, as with endometrial cancer, is managed with hysterectomy [18]. A thickened endometrium is the reliable predictor of endometrial diseases [22]. The appearance of the endometrium is related to multiple factors, including patient’s age, stage in the menstrual cycle, and whether she has undergone hormonal replacement therapy [23]. The clinical approach to abnormal uterine bleeding requires prompt and efficient evaluation to exclude or diagnose endometrial carcinoma and endometrial intraepithelial neoplasia [12]. Potential screening modalities for endometrial cancer include transvaginal sonography (TVS), saline infusion Sono hysterography, 3-D colour Doppler ultrasound, endometrial sampling through endometrial aspiration biopsy, dilatation and curettage, hysteroscopy, and guided biopsy. Subsequently, an attempt has been made to effectively and promptly evaluate a woman with abnormal uterine bleeding [11]. Measurement of endometrial thickness by Ultrasonography and endometrial biopsy in Perimenopausal and postmenopausal women with abnormal bleeding can be a useful tool to identify endometrial

hyperplasia and endometrial carcinoma [21]. Ultrasonography is usually a safe initial investigation as it is non-invasive and can give us an idea about any structural cause [3]. Ultrasound plays a significant role in evaluation of endometrium, it is inexpensive, needing no anaesthesia with minimal inconvenience to the patient and can be the first diagnostic step in the evaluation of AUB [23,24]. The transvaginal ultrasound (TVS) is an internal ultrasound. It is used for indirect visualization of the endometrium. It involves scanning with the ultrasound probe lying in the vagina. It usually produces better and clearer images of the female pelvic organs, because the ultrasound probe lies closer to these structures [23]. The advantage of TVS is that it can be performed with empty bladder and is convenient for the patient and at the same time, it is suitable for getting more correct gynaecological diagnosis, especially in fatty women with a thick abdomen. TVS is superior to CT and approaches MRI in its ability to provide information about myometrial, cervical and myometrial invasion of endometrial carcinoma. TVS is clinically established as the preferred technique for the evaluation of endometrial disorders, especially abnormal uterine bleeding [22]. Endometrial evaluation with transvaginal sonography has clinical relevance in premenopausal women. Transvaginal sonography is an efficient and acceptable non-invasive method for the early detection of endometrial pathology in postmenopausal women and has been used as a screening method in asymptomatic postmenopausal women before or during hormonal replacement therapy [17,22]. This technique may allow for the selection of subjects in whom an early diagnosis of endometrial cancer can be made and who would have the best opportunity to be cured. Currently, some women often undergo TVS as part of a routine gynaecologic examination, which is commonly performed as a health-checkup [20]. The thickened endometrium during menopause is the most significant ultrasonographical criterion implicating its pathology [22]. Transvaginal ultrasound using a ≤ 3-mm cut-off has high sensitivity for detecting endometrial cancer [25]. Screening methods such as cervical or vaginal cytology are not sufficiently accurate for the detection of endometrial carcinoma while direct intrauterine cell sampling and hysteroscopy are not practical screening methods because of their invasive nature. Transvaginal sonography is useful for detecting and determining the extent of changes in the endometrium in patients who have undergone biopsy, as well as for detecting other abnormalities of the pelvis in women with abnormal bleeding from the uterus [17]. An endometrial biopsy is a safe and efficient office-based procedure for sampling the endometrium in a patient presenting with abnormal uterine bleeding. The endometrial tissue obtained provides a diagnosis for wide range of morphologic patterns, normal and abnormal changes like hyperplasia, exogenous hormonal effects, infections, carcinoma which helps in further management [21]. The selection of possible indicators for biopsy to exclude endometrial cancer is contentious and current guidance varies. Age cut-off, above which patients are referred is 40 years [26]. Histopathological examination should be recommended before diagnosis to recognize the condition, provide early treatment and to avoid further complications [27]. The endometrium is sampled when pathology is suspected; this may be when the patient experiences a change in normal pattern of menstrual bleeding [23]. Histopathological evaluation of endometrial tissue by dilatation and curettage or aspiration is a safe & effective method for determining the cause of AUB after excluding systemic and structural causes [3]. As the regular endometrial cycle follows a precisely scheduled series of morphological changes, there are wide range of diagnostic possibilities in the evaluation of women who present with AUB [6]. The endometrial biopsies and curetting on histopathology revealed various patterns ranging from normal endometrium to malignancy. Majority of the patients with AUB presented with normal cyclic endometrium, followed by disordered proliferative endometrium and hyperplasia to malignancy, however, frequency of cause varies with age [19,28]. Endometrial carcinoma is one of the most common malignancies of the female genital tract and is often preceded by a histologically evident precursor lesion, "hyperplasia" [6]. The sensitivity of endometrial biopsy for the detection of endometrial abnormalities has been reported to be as high as 96%. Post-menopausal females presenting with abnormal uterine bleeding have an increased risk of hyperplasia and malignancy hence

requires immediate evaluation with endometrial biopsy [29]. Dilation and curettage are helpful to exclude other organic pathology, which mimics AUB. It is useful for diagnosis and to know pathological incidence of organic lesions in cases of AUB prior to surgery [30]. It can be a diagnostic as well as therapeutic procedure [29]. Ultrasonography and endometrial biopsy, methods of detecting endometrial hyperplasia or carcinoma must be considered early in investigation of abnormal uterine bleeding [21]. Transvaginal ultrasonography is a reasonable alternative to endometrial sampling as a first approach in evaluating abnormal uterine bleeding [12]. Endometrial biopsy has been considered as a standard for the clinical diagnosis of endometrial disease among asymptomatic patients, but it is invasive, may be uncomfortable, and may not be able to be performed in some patients with cervical stenosis. Ultrasound evaluation is less invasive and more comfortable and can be performed in patients with cervical stenosis [22]. Transvaginal ultrasonography is appropriate for an initial evaluation of postmenopausal bleeding if the ultrasound images reveal a thin endometrial echo (less than or equal to 4 mm), given that an endometrial thickness of 4 mm or less has a greater than 99% negative predictive value for endometrial cancer and can be useful in the triage of women in whom office endometrial sampling was performed but tissue was insufficient for diagnosis [12]. But an axial uterus, obesity, coexisting myomas, adenomyosis, or previous uterine surgery can contribute to difficulty in obtaining reliable transvaginal ultrasound assessment of endometrial thickness and texture [12]. Since rare cases of endometrial carcinoma (particularly type II) with an endometrial thickness of less than 3 mm may occur, persistent or recurrent uterine bleeding should prompt an endometrial histologic evaluation regardless of the thickness of the endometrium [12]. thickened endometrium is the reliable predictor of endometrial diseases, although this sign is sensitive indicator, non-specificity of this has led most clinicians to use tissue specific techniques such as blind endometrial biopsy as initial screening methods for diagnosis of endometrial diseases. This study was conducted in premenopausal and postmenopausal patients presenting with abnormal uterine bleeding who were subjected to transvaginal sonography. Endometrial biopsy was taken and correlated with the histopathological pattern. It studied the endometrial thickness by transvaginal sonography and correlate it with the histopathological pattern evaluated by endometrial biopsy.

2. MATERIALS & METHOD

There exists correlation between endometrial thickness in TVS & histopathology of endometrium. This is a Prospective cross-sectional study which is Conducted in Department of Obstetrics & Gynaecology, Patan Academy of Health Sciences for a period of one year.

Minimum sample size is calculated using the formula below

$$n = Z^2 P(1-P) / d^2$$

Where,

Z =standard normal variate = 1.96

P = Expected proportion in population based on previous studies or pilot studies.

d = absolute error or precision = 0.05

Using the formula, minimum sample size is calculated

According to the study done in Paropakar Maternity and Women's Hospital, Thapa thali, Kathmandu

P = 2.2%, the minimum sample size is 33

1.96*1.96*0.022 * (1-0.022) /0.05*0.05

All women fulfilling the inclusion criteria who visit outpatient or inpatient department were selected. Informed consent was taken. Detailed history was taken regarding age, parity, menstrual cycle, past medical, drug & contraceptive method. Clinical examination was done i.e. general physical/ systemic, per speculum & per vaginal examination. Transvaginal sonography was done to measure thickness of endometrium independent of the phase of cycle. The thickest part of the endometrium was measured perpendicular to its longitudinal plane in the anteroposterior diameter, representing the distance between the echogenic borders. Endometrial biopsy was taken within 48 hours after transvaginal sonography is done. Patient was asked to visit OT, Nil per Oral from midnight on the day of procedure. Under intravenous anesthesia, endometrial biopsy was taken using uterine curette. Specimen was put in 10% formalin, appropriately labeled for patient's name, age, hospital number & type of specimen. A histopathological examination form was filled & thus obtained tissue was sent for histopathological examination. Patient was asked to visit OPD 2 weeks following procedure with histopathological reports. Findings were recorded in Performa. Collected data was entered in Microsoft Excel and processed in EPI Info for statistical analysis. The analysis was done in terms of age, type of AUB, transvaginal sonographic findings, histopathological findings, comparison between transvaginal sonographic findings and histopathological description. All data were analysed manually and with the help of EPI Info and comparison of variables were done. Results were presented in tables. Pearson's Correlation Coefficient test was used to correlate transvaginal sonographic findings and histopathological description and investigate statistical significance. Approval from Institutional Review Committee (IRC) of PAHS was taken and then the study was started. Informed consent was taken from all the patients participating in the study. Patients were given option of voluntary withdrawal from the study at any point of time and their profiles were kept confidential.

3. RESULTS & DISCUSSION

Table 01: Age group (years), frequency & percentage (%).

Age group (years)	Frequency	Percentage (%)
40-49	22	60
50-59	12	32
≥60	3	8
Total	37	100

Majority of women were in the age group 40-49 years (60%). Median age was 47 years.

Table 02: Distribution of women with AUB according to Pattern of bleeding

Pattern of bleeding	Frequency	Percentage (%)
Menorrhagia	18	48.6
Poly menorrhoea	8	21.6
Metrorrhagia	5	13.5
Postmenopausal	5	13.5
Oligomenorrhoea	1	2.7
Total	37	100

Eighteen women were suffering from menorrhagia (48.6%) while only 1 woman presented with oligomenorrhoea (2.7%).

Table 03: Distribution of women with AUB according to endometrial thickness

Endometrial thickness (mm)	Frequency	Percentage (%)
<5	11	29.7
5-10	16	43.3
≥10	10	27.0
Total	37	100

43.2% women had endometrial thickness of 5-10mm and 27% had ≥10mm.

Table 04: Distribution of women with AUB according to histopathological findings

Histopathological finding	Frequency	Percentage (%)
Proliferative Endometrium	17	45.9
Secretory Endometrium	10	27
Disordered Proliferative Endometrium	5	13.5
Hyperplasia	2	5.4
Endometrial carcinoma	3	8.1
Total	37	100

Out of 37 women, endometrial hyperplasia and endometrial carcinoma were seen in 2 and 3 women respectively (5.4% and 8.1%) and 17 women had proliferative endometrium (45.9%)

Table 05: Comparison of endometrial thickness with age and histopathological findings in women with AUB

Histopathological findings	Age in years									
	40-49 yrs			50-59 yrs			≥60yrs			Total
	Endometrial thickness (mm)									
	< 5	5-9.9	≥ 10	< 5	5-9.9	≥ 10	< 5	5-9.9	≥ 10	
Proliferative Endometrium	4	4	1	3	3	0	0	1	0	17
Secretory Endometrium	4	3	1	0	1	1	0	0	0	10
Disordered Proliferative Endometrium	0	2	2	0	0	1	0	0	0	5
Hyperplasia	0	0	1	0	1	0	0	0	0	2
Endometrial carcinoma	0	0	0	0	0	1	0	0	2	3
Atrophic	0	0	0	0	0	0	0	0	0	0
Total	8	9	5	3	5	3	0	1	2	37

Comparing age with endometrial thickness and histopathological finding, results showed that proliferative endometrium was seen in 40-49 yrs with <5mm while endometrial carcinoma was seen in age of >50yrs with endometrial thickness of ≥10mm.

Table 06: Correlation of endometrial thickness and histopathological findings in women with AUB

Histopathological findings	TVS findings of endometrial thickness			
	<5mm	5-9.9mm	≥10 mm	Total
Proliferative Endometrium	7	9	1	17

Secretory Endometrium	4	4	2	10
Disordered Proliferative Endometrium	0	2	3	5
Hyperplasia	0	1	1	2
Endometrial carcinoma	0	0	3	3
Total	11	16	10	37

DISCUSSION

Abnormal uterine bleeding is a common condition affecting otherwise healthy women at all ages and interferes with women's physical, emotional and social quality of life. It is important to reach correct clinical diagnosis and identify the causative factor. In this study, 22 women (60%) of 40-49 yrs age group were suffering from AUB. This finding is close to the study done by Shobhita GL et al from April 2012 to March 2013 among 55 women of perimenopausal age group presenting with AUB at Siddharth medical college, Vijayawada, Andra Pradesh, India which showed that the most common age group of presentation was 41-45 years which was 36.4% and 46-50 years which was 32.7% [30].Similarly, Shobha Rani MS et al conducted the study during 2 years period from 2011 to 2012 among 84 cases of AUB of perimenopausal age group (40-54 years) in Department of obstetrics and gynaecology, at community health centre, Veldurthi, Kurnool district which showed that majority of the women belonged to age group 40-45 years which was seen in 58 cases (69%) [31]. Shah R et al also conducted a study over the period of 1.5 years among 320 women presenting with AUB in Department of pathology, Tertiary care hospital, Ahmedabad, India which showed that the mean age of presentation was 42.6 ± 6.9 years and this was found to be similar to this study [32]. Also, a study done by Bhosle A et al during the period of 6 months among 112 women presenting with perimenopausal bleeding and it showed that majority of the women belonged to age group 40-45 years which was 85 in number (76.1%) and it is higher than this study because the sample size is more as compared to this study [33]. A study done by Bhosle A et al during the period of 6 months among 112 women presenting with perimenopausal bleeding which showed that majority of the women presented with menorrhagia which was seen in 53.3% cases and this is similar to this study.26 Similar result was shown by Lotha L et al for a period of 1 year from 1st Nov 2014 to 30th Nov 2015 among 148 women presenting with AUB which showed that menorrhagia was seen in 49% cases. [34] Similarly, Shobhita GL et al conducted a study from April 2012 to March 2013 among 55 women of perimenopausal age group presenting with AUB at Siddharth medical college, Vijayawada, Andra Pradesh, India which also showed the most common clinical presentation was menorrhagia which was seen in 27 women (40%) and it is lower than this study.[32] Similar to this, [34] also conducted a study during 2 years period from 2011 to 2012 among 84 cases of AUB of perimenopausal age group (40-54 years), which showed that majority of the women presented with menorrhagia which was seen in 27 cases(45%) which is slightly lower than this study [33]. Similar to that Varun N et al conducted a study over the period of 1 year from Jun 2017 to Jun 2018 among 100 women of age group 35-58 years in Department of obstetrics and gynaecology in a medical college which showed that menorrhagia was the commonest clinical presentation which was seen in 54% of cases which is slightly higher than this study [35]. This might be due to the study population being only perimenopausal women and postmenopausal women not being included. In this study, 16 women (43.2%) had endometrial thickness of 5-9.9mm. likewise study done by Pillai SS from Jan 2012 to Nov 2013 among 88 women presented with perimenopausal bleeding at Cochin medical college, Cochin, Kerala, India which showed that the majority of the patient had endometrial thickness between 5-9.9mm which was seen in 41 women (46.6%) which is comparable to this study [9]. Shobhita GL et al also conducted a study from April 2012 to March 2013 among 55 women of perimenopausal age group presenting with AUB at Siddharth medical college, Vijayawada, Andra Pradesh, India which showed that the majority of the women had endometrial thickness between 8-15mm which was seen in 45.5% cases

while 4-8mm of endometrial thickness was seen in 34.5% [31]. In a study done by P. Thulasi et al in the department of Obstetrics and Gynaecology and department of Radio diagnosis at P K Das Institute of Medical Sciences over a period of one year in 75 women in the peri-menopausal and postmenopausal period, endometrial thickness of 5-8mm in 24% women and 8-10mm in 46.66% which is higher than this study [31]. Current study shows the commonest histopathological finding was proliferative endometrium in 17 cases (45.9%). In study done by Shobha Rani MS et al during 2 years period from 2011 to 2012 among 84 cases of AUB of perimenopausal age group (40-54 years) in Department of obstetrics and gynaecology at community health centre, Veldurthi, Kurnool district, it showed that majority of the women had proliferative endometrium which was seen in 34 cases (40.4%) which was similar to this study [33]. Histopathological findings in this study showed that proliferative endometrium was most commonly seen i.e. in 17 women (45.9%). A study done by Pillai SS from June 2012 to Nov 2013 among 88 women presented with perimenopausal bleeding at Cochin medical college, Cochin, Kerala India showed that the most common histopathological finding was proliferative endometrium which was seen in 24 women (27.2%) which is lower than this study [9]. In this study, disordered proliferative endometrium was seen in 5 women (13.5%). A study done by D Bishnu over a period of 1 year on 100 perimenopausal patients in the department of Obstetrics and Gynaecology, Gauhati medical college and hospital from 1st August, 2016 to 31st July, 2017showed those 21 cases (21%) had disordered proliferative endometrium which is different from this study [36]. Bhosle A et al during the period of 6 months among 112 women presenting with perimenopausal bleeding which showed that majority of the women had proliferative endometrium which was seen in 74 cases (66.1%) which is higher than this study. Also seen in this study were 3 cases (8.1%) of endometrial carcinoma and 2 (5.4%) cases of endometrial hyperplasia was seen [32]. In study done by Shobha Rani MS et al during 2 years period from 2011 to 2012 among 84 cases of AUB of perimenopausal age group (40-54 years) in Department of obstetrics and gynaecology at community health centre, Veldurthi, Kurnool district, 1 case (1.1%) of well differentiated adenocarcinoma was seen which was lower compared to this study [37]. In contrast to this study, Shobhita GL et al conducted a study from April 2012 to March 2013 among 55 women of perimenopausal age group presenting with AUB at Siddharth medical college, Vijayawada, Andra Pradesh, India showed the most common HPE findings where endometrial hyperplasia was seen in 25 women (45.45%) and 1 case (1.8%) of endometrial carcinoma was seen. Since postmenopausal women were not included, endometrial carcinoma was seen in less number in the above-mentioned studies. Histopathological finding of atrophic Endometrium was nil. This may be due to the less sample size taken for this study. There is significant positive correlation between endometrial thickness in TVS and histopathological examination, $r = .512$ and p-value is .001 ($p \leq .05$), i.e. the test is significant in this study. Also, the correlation of TVS and HPE findings showed that most of the women had proliferative endometrium at 5-9.9mm i.e. in 9 women, while 8 women had secretory endometrium with endometrial thickness of <10mm, 3 women with disordered proliferative endometrium at ≥10mm, 1 woman with endometrial hyperplasia≥ 10mm and all 3 women with endometrial carcinoma had endometrial thickness of ≥10mm in transvaginal sonography. Shrestha P et al conducted a study in the Department of Obstetrics and Gynaecology of Manipal Teaching Hospital, Nepal in 105 women which showed 22 women with proliferative endometrium in endometrial thickness of 11-15mm, 13 women with secretory endometrium in endometrial thickness of 5-10mm and malignancy in 3 women with endometrial thickness >10mm [21]. In study done by Shobhitha GL et al from April 2012 to March 2013 among 55 women of perimenopausal age group presenting with AUB at Siddharth medical college, Vijayawada, Andra Pradesh, India, it showed that proliferative endometrium was seen in 13 cases at endometrial thickness at 4-8mm, secretory endometrium was seen in 7 cases at 1-6mm, endometrial hyperplasia was seen in 14 cases at endometrial thickness at 8-15mm and endometrial carcinoma was seen in 1 case at endometrial thickness 8-15mm [32]. In study done by Pillai SS from June 2012 to Nov 2013 among 88 women presented with perimenopausal

bleeding at Cochin medical college, Cochin, Kerala, India showed that 12 women with endometrial thickness of 5-9.9 had proliferative endometrium, 10 women showed disordered proliferation at endometrial thickness 5-9mm, 1 case cases of carcinoma of endometrium was seen at endometrial thickness 15-19.9mm and 3 cases of carcinoma of endometrium was seen at endometrial thickness >20mm [9]. Thus, as in above mentioned studies, the increase in thickness of the endometrium (as evident in transvaginal sonography), increases the risk of hyperplasia and carcinoma.

4. CONCLUSION

Transvaginal sonography was done to measure endometrial thickness and endometrial biopsy was taken and sent for histopathological examination. Histopathological reports were reviewed and analysis done with EPI info software. The most common age group presenting with AUB was 40-49 years in 22 women (60%). Total 16 women (43.2%) had endometrial thickness of 5-9.9mm and ≥10mm in 10 women (27.0%) in TVS finding showed that proliferative endometrium was most commonly seen i.e. in 17 women (45.9%) and endometrial carcinoma was seen in 3 women (8.1%). The most common clinical presentation was menorrhagia in 18 women (48.6%) and least common was oligomenorrhea in 1 woman (2.7%). The correlation of TVS and HPE finding of the study showed that there is significant positive correlation between endometrial thickness in TVS and histopathological examination, r = .512 and p-value is. 001.Transvaginal sonography is a tool for the evaluation of AUB as an initial procedure. Endometrial biopsy is a procedure for histological evaluation of the endometrium and remains the standard diagnostic procedure for the assessment of abnormal uterine bleeding. In women with AUB, they are useful tools to identify various histopathological finding like endometrial carcinoma. Thus, sonography with histological assessment of the endometrium is the corner stone for diagnosis and for further management. Transvaginal sonography is a tool for the evaluation of AUB as an initial procedure. Endometrial biopsy is a procedure for histological evaluation of the endometrium and remains the standard diagnostic procedure for the assessment of abnormal uterine bleeding. In women with AUB, they are useful tools to identify various histopathological finding like endometrial carcinoma. Thus, sonography with histological assessment of the endometrium is the corner stone for diagnosis and for further management.

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