

Correlation of Histopathological Findings and Ultrasound Findings in women with abnormal uterine bleeding

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Abstract

Background: Menstruation is triggered by progesterone withdrawal after corpus luteum regression, leading to endometrial shedding. Heavy menstrual bleeding affects up to 30% of women, impairing quality of life. Management of acute abnormal uterine bleeding involves stabilizing patients, medical or surgical interventions, and prognosis depends on the underlying cause and quality-of-life impact.

Objectives: To study the correlation between ultrasound findings and histopathological findings in women who suffer from heavy menstrual bleeding.

Methods: A descriptive cross-sectional study conducted at AL Mawanee hospital from the first of October 2024 till the first of May 2025 included 80 women (45–55 years) with heavy menstrual bleeding, assessing ultrasound and histopathology correlations, excluding malignancy, hormonal, and bleeding disorders.

Results: In this study of 80 women (mean age 49 ± 7.2 years), most were multiparous (83.7%) and housewives (72.5%). Menorrhagia (52.5%) was the commonest presenting symptom. Ultrasound revealed fibroids (27.5%), thickened endometrium (22.5%). Histopathology showed proliferative endometrium (17.5%), hyperplasia without atypia (12.5%), with atypia (7.5%), carcinoma (6.25%), atrophy (13.7%), and leiomyoma (15%). Significant correlations existed between endometrial thickness ≥ 20 mm and premalignant/malignant lesions ($p < 0.001$).

Conclusions: Menorrhagia is commonly linked to benign uterine conditions, though some cases involve premalignant or malignant pathology. Ultrasound aids initial assessment, but histopathology remains the diagnostic gold standard. Combining both improves accuracy, management decisions, and reduces missed diagnoses.

Keywords: Correlation, Histopathological Findings, Ultrasound, Menorrhagia.

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Introduction

Menstruation refers to the shedding of the

superficial layers of the endometrium with subsequent repair in preparation for regrowth from the basalis layer. Menstruation is initiated by the fall in circulating progesterone that follows luteal regression, i.e. failure of rescue of the corpus luteum by an implanted early pregnancy. The menstrual cycle comprises 2 distinct cycles—one within the ovary and another within the endometrium. The phases of the ovarian cycle include the follicular phase, ovulation, and the luteal phase. The endometrial cycle consists of the proliferative phase, the secretory phase, and the menstrual phase. Generally, the ovarian follicular phase corresponds to the menstrual and proliferative phases of the endometrium, while the luteal phase of the ovarian cycle corresponds to the secretory phase of the endometrial cycle (1).

Normal menstruation, the sudden drop in progesterone and estradiol levels at the end of the luteal phase triggers the shedding of the endometrial lining, which can no longer be maintained without these hormones. The first day of menstrual bleeding is marked as day one of the menstrual cycle, indicating that menstruation occurs during the early part of the follicular phase. On average, the menstrual cycle lasts about 29 days, though a normal range can vary from 22 to 39 days. The duration of menstruation varies, but normal bleeding typically lasts 8 days or less. Menstrual fluid is composed of blood, endometrial cells, vaginal secretions, and various biochemical substances, including proteolytic

enzymes, cytokines, and fibrinolytic products. Blood clots are generally absent from menstrual fluid unless the bleeding is particularly heavy (2).

Menstrual disorders are common among women of reproductive age. Heavy menstrual bleeding affects up to 30% of women throughout their reproductive life (3). Heavy menstrual bleeding (HMB) is defined as excessive menstrual blood loss that negatively impacts a woman's physical, emotional, social, and reproductive quality of life. Patients with HMB may present with various abnormal uterine bleeding (AUB) patterns, including menorrhagia (prolonged or heavy regular menstrual bleeding), polymenorrhea (frequent menstruation), and metrorrhagia (irregular or intermenstrual bleeding). (4)

The International Federation of Gynecology and Obstetrics (FIGO), in collaboration with the American College of Obstetricians and Gynecologists (ACOG), has established the PALM-COEIN classification system to categorize AUB into structural causes and non-structural causes. (5)

Previously referred to broadly as menorrhagia, AUB represents a significant public health issue among women in the United States, substantially affecting quality of life, productivity, and healthcare utilization. The estimated annual prevalence is approximately 53 per 1,000 women. In outpatient gynecological settings, HMB is a leading reason for consultation, accounting for 20–30% of visits annually. (5)

The prognosis of abnormal uterine bleeding (AUB) is largely contingent upon the underlying aetiology, as categorised by the PALM-COEIN system. In premenopausal women experiencing acute uterine bleeding, the foundation of prognostic data is quality

of life; 50% of women with abnormal uterine bleeding report blood loss of less than 40 mL, indicating that quality of life influences the choice to pursue medical care. According to quality of life tests, women with AUB will score lower than the 25th percentile for women of similar age. It's critical to consider quality of life in addition to mortality and morbidity while assessing, managing, and treating these patients. (6)

Objective of the study

To study the correlation between ultrasound findings and histopathological findings in women who suffer from heavy menstrual bleeding.

Patients and Methods

A descriptive cross-sectional study was conducted at AL Mawanee hospital from the first of October 2024 till the first of May 2025. 80 women aged from 45-55 years presented with heavy menstrual bleeding and were included in the study. The purpose of this study is to assess the association between histopathological findings and ultrasound findings in patients with heavy menstrual flow.

Normal menstrual bleeding is defined as a cycle that lasts for 2-8 days with 5-80 ml flow every 21-35 days. Heavy menstrual bleeding is defined as heavy flow more than these indices. Menorrhagia is defined as a heavy, prolonged cycle; metrorrhagia is defined as vaginal bleeding that occurs at irregular intervals not associated with the menstrual cycle, polymenorrhea is a term for frequent, short menstrual cycles, and oligomenorrhea is characterised by infrequent menstrual periods. (7)

The data was collected from the AL-Mawanee gynecological department through a special questionnaire that included participants' demographic

and clinical characteristics (age, parity, and education, occupation, marital status, presenting symptoms, duration and chronic medical disease). Menstrual history (duration, regularity, amount, length of cycle). Women with malignancy, who had bleeding tendency or its treatments, on hormonal therapy and endocrine disorders were excluded.

Clinical diagnosis is based on self-report by a woman of increasing numbers of days of flow or numbers of sanitary pads.

Initially, participants were asked to full a bladder. After that abdominal ultrasound was done by an experienced female radiologist for all participants, and endometrial thickness and other pathologies were reported. All participants underwent diagnostic curettage, and endometrial samples were sent for histopathology.

Approval for conducting the study was officially granted by the Basrah health directorate. Verbal consent was obtained from all women enrolled in the study before their participation. Ultrasound was evaluated by a female doctor then the finding was correlated with histopathological findings.

Statistical analysis

Data analysis was performed using the Statistical Package for Social Sciences (SPSS), version 26. Quantitative data were expressed as mean $\pm$ standard deviation, while qualitative data were summarized as frequencies and percentages. A significance level (p-value) of ≤ 0.05 was considered statistically significant.

Result

This table shows the distribution of participants' demographic and clinical characteristics. The mean age is 49 years, most of the participants are multipara, 83.75%, and married 90%. The most presenting symptoms are menorrhagia, 52.5 % followed by metrorrhagia, 21.3% followed by polymenorrhea, 17.5%.

Table 1: Demographic and clinical characteristics of the studied participant

Variables		No	%
Age	Mean± sd	49.31± 7.2	
	Range	(45 -55)	
Parity	Nullipara	13	16.25
	multipara	67	83.75
Educational level	Illetrate	16	20.0
	Primary	24	30.0
	Secondary	22	27.5
	College Education	18	22.5
Occupation	Employed	22	27.5
	Housewives	58	72.5
History of Chronic	Yes	23	28.75
	No	57	71.2

disease			5
Presenting symptoms	Heavy menstrual bleeding (menorrhagia)	42	52.5
	Polymenorrhea	14	17.5
	metrorrhagia	17	21.3
	oligomenorrhea	7	8.7
Duration of symptoms	Mean± Sd	5.6 ± 3.1	

Ultrasonographic Findings of endometrium in participants with abnormal uterine bleeding (n = 80). This table shows the role of the US in detecting uterine abnormality 22.5% of participants showed thickened endometrium, 27.5% fibroid, 15% endometrial polyp and 18.75 % no abnormalities.

Table 2: Findings of ultrasound

Findings of the ultrasound	No.	%
Fibroid	22	27.5
Adenomyosis	10	12.5
Endometrial Polyp	12	15.0
Endocervical polyp	3	3.75
Thickened endometrium	18	22.5
No abnormality detected	15	18.75
Total	80	100.0

This table shows the distribution of endometrial thickness; 20% had critically serious endometrial thickness more than 2cm, 41.2% of participants showed endometrial thickness of 8-19mm.

Table 3: Endometrial Thickness by Ultrasound in participants with abnormal uterine bleeding (n = 80)

Endometrial thickness	No.	%
<8 mm	31	38.75
8-19	33	41.25
20 and more	16	20.00

This table shows the histopathological pattern. Most of the cases with proliferative endometrium, 17.5%, 12.5% endometrial hyperplasia without atypia, 7.5% atypia, 13.75% atrophic and 6.25% endometrial carcinoma.

Table 4: Histopathological patterns of endometrium in participants with abnormal uterine bleeding (n = 80)

Findings of histopathology	No.	%
Normal histology (secretory)	12	15.0
proliferative endometrium	14	17.5
endometrial hyperplasia without atypia	10	12.5
endometrial hyperplasia with	6	7.5

atypia		
Carcinoma	5	6.25
Leiomyoma	12	15.0
Endometrial polyp	10	12.5
Atrophic endometrium	11	13.75
Total	80	100.0

This table shows a significant association between ultrasound and histopathological findings regarding risk of endometrial hyperplasia with atypia and endometrial carcinoma, p-value 0.008, 0.002, respectively and also normal secretory endometrium (p=0.002).

Table 5: Correlation Between Ultrasound and Histopathology

Histopathology	<8	8-19	>20	p-value
Normal(secretory)	10 (32.3)	2 (6.1)	0 (0.0)	0.002
Disorder proliferative	7 (22.6)	6 (18.2)	1 (6.3)	0.374
Endometrial hyperplasia without atypia	1 (3.2)	6 (18.2)	3 (18.8)	0.136
Endometrial hyperplasia with atypia	0 (0.0)	2 (6.1)	4 (25.0)	0.008
Carcinoma	0 (0.0)	1 (3.0)	4 (25.0)	0.002

Liomyioma	5 (16.1)	5 (15.2)	2 (12.5)	0.946
Endometrial polyp	3 (9.7)	5 (15.2)	2 (12.5)	0.803
Atrophic Endometrium	5 (16.1)	6 (18.2)	0 (0.0)	0.197
Total	31 (100.0)	33 (100.0)	16 (100.0)	

This table showed a highly significant association between endometrial thickness diagnosed by ultrasound and premalignant and malignant conditions.

Table 6: Association between endometrial thickness and pre-malignant and malignant conditions

Endometrial thickness	Benign	Premalignant and malignant	p- value
<8	31 (44.9)	0 (0.0)	0.001
8-19	30 (43.5)	3 (27.3)	
≥ 20	8 (11.6)	8 (72.7)	

Discussion

Women in perimenopause frequently face heavy menstrual bleeding due to anovulation and stimulatory unopposed estrogen effect, which subsequently leads to endometrial hyperplasia and endometrial carcinoma (8). As AUB is almost always

indicative of underlying pathology, we try in this study to find a significant correlation between ultrasound and histopathological findings in patients with abnormal bleeding and their ability to detect premalignant and malignant conditions

Although the age cut-off values on this topic vary in different studies, in this study, the mean age is 49 years (9). More than two-thirds (83.75%) of participants were multipara, similar to the Baghal et al group, and 90% of them were married (10). The pattern of menstrual abnormalities also varies in different studies, but menorrhagia is the commonest presenting symptom, and this is very similar to our studies, as 52.5% presented with menorrhagia, followed by metrorrhagia, 21.3% polymenorrhia, 17.5% and 8.7% oligomenorrhia (11).

In our study, fibroid (27.5%) was the commonest ultrasound finding, followed by thickened endometrium 22.5% and this is in disagreement with Daga et al (12) study, where 39.4% of participants had fibroid. 12.5% of participants had adenomyosis in this study, which is consistent with Daga et al; study, 15.4% (12). The prevalence of endometrial polyps in our current study was 15% which is higher than Shoba's study 7 % (13), and nearly one fifth of cases (18.75%) had no detected abnormalities. 20% of cases had endometrial thickness of 2cm or more, 41.2% endometrial thickness of 8-19 and 38.7% less than 8mm, and this differs from a study done by Dr Mamata Kumari that showed only 7.3% of cases with endometrial thickness of 2cm or more, 42.5% 8mm or less (14)

Endometrial biopsy is a simple, minimally invasive procedure that plays a crucial role in the diagnosis of endometrial pathology. All our participants underwent an endometrial biopsy. The commonest

endometrial pattern is proliferative, 17.5% and this is inconsistent with Mathew et al (15), which showed secretory endometrium is the commonest or with Sajitha et al.'s study, where endometrial hyperplasia was the most common pathology (16).

Risk of endometrial carcinoma was 6.25%, which is higher than the Shoba Pillai study, where the risk was 4.5 % (13). 12.5% of cases showed atrophic endometrium similar to Mahmoud et al, especially in patients above 50 years (17). 7.5%, 12.5 % of cases had endometrial hyperplasia with atypia and without atypia, respectively and this is similar to a study done by Anastasiadis et al, which showed that the prevalence of endometrial hyperplasia was 20% (18).

Almost all the premalignant and malignant (72.7%) cases (Endometrial hyperplasia with atypia and endometrial carcinoma) had an endometrial thickness of 2cm or more. The correlation between ultrasound and histopathological findings is highly significant in our study, i.e there is no risk of endometrial hyperplasia with atypia or endometrial carcinoma at endometrium 8mm or less, and this is in consistent with Aliya Aslam study which showed no major endometria pathology is detected at 14 mm or less (19) and in disagreement with Heera et al; (20)

Recommendation

Based on the current study, it is recommended that ultrasound and histopathology be integrated into the diagnostic pathway for reproductive-aged women with menorrhagia to enhance diagnostic accuracy. Endometrial thickness should be used to stratify risk, with urgent biopsy advised for women with a thickness of 20 mm or more, and histological evaluation for intermediate-risk cases (8–19 mm) based on symptoms and risk factors. Unnecessary invasive procedures should be avoided in low-risk

women with endometrial thickness below 8 mm, provided no other concerning features are present. Additionally, improving clinician training in pelvic ultrasonography can enhance diagnostic precision, while patient education on the significance of abnormal bleeding is vital for early detection of pre-malignant and malignant conditions. Finally, multicentre studies with larger sample sizes are recommended to refine diagnostic criteria and validate endometrial thickness cut-offs in reproductive-aged populations.

References

1. Edmonds, D. K., Lees, C., & Bourne, T. H. (Eds.). (2007). *Dewhurst's textbook of obstetrics & gynaecology* (p. 534). Blackwell Pub..
2. Thiyagarajan, D. K., Basit, H., & Jeanmonod, R. (2024). Physiology, menstrual cycle. In *StatPearls [Internet]*. StatPearls Publishing.
3. McCluggage, W. G. (2006). *My approach to the interpretation of endometrial biopsies and curettings*. *Journal of Clinical Pathology*, 59(8), 801-812.
4. Singh, M., Sachan, R., & Yadav, A. (2019). Significance of endometrial thickness on transvaginal sonography in heavy menstrual bleeding. *Journal of Current Research in Scientific Medicine*, 5(1), 28-32.
5. Walker MH, Coffey W, Borger J. Menorrhagia. [Updated 2023 Aug 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing;
6. Reed, B. G., & Carr, B. R. (2015). The normal menstrual cycle and the control of ovulation.

7. Holesh, J. E., Bass, A. N., & Lord, M. (2017). Physiology, ovulation.
8. Vidhya Selvam, Pooja Lakshminarayanan. A comprehensive approach: correlation ultrasound imaging with endometrial analysis in perimenopausal women with heavy menstrual bleeding. 2024 Mar 29;16(3):e57201. Doi.
9. M. R. Wise , P. Gill , S. Lensen , JMD. Thompson, CM Farquhar. Body mass index trumps age in decision for endometrial biopsy : cohort study of symptomatic premenopausal women . AMJ Obstet Gynecol , 2016, pp. 598 . e1 – 598 . e 8 .
10. Baghal M, Chandwaskar N, Agrawal S, etal. Assessment of perimenopausal bleeding. Int J Reprod Contraception Obstet Gynecol . 2016; 5:n487-490 .
11. TVan Den Bosch , L . Ameye , D .Van Schoubroeck, T. Bourne, D. Timmerman. Intra-uterine pathology in women with abnormal uterine bleeding: a prospective study of 1220 women . fact views vis obgyn, , 7 (2015)p. 17 .
12. Daga S , Phatak S . Sonography evaluation of abnormal uterine bleeding in perimenopausal women with pathological correlation. J Datta Meghe Inst Med Sci Uni . 2019;14:288-292.
13. Shoba Pillai etal. Sonographic and histopathological and evaluation of endometrium in perimenopausal women with abnormal uterine bleeding . International J of Reprod , Contracept , Obstet Gynecol . 2014; vol 3 :1.
14. Mamta Kumari , Meena Dayal, Amrita Chaurasia ,Shakti Jain . study of endometrium by ultrasound and histopathology in abnormal uterine bleeding .Indian Journal of Applied Research. 2020;vol10:4 .
15. Mathew GT, Maheswari U, Shanmugam K. Int J Reprod Contraception Obstet Gynecol. 2020; 9 :1416-1421.
16. Sajitha K, Padma SK, Shetty KJ, etal . study of histopathological patterns of endometrium in abnormal uterine bleeding. CHRISMED J Health Rees. 2014;1: 76-81.
17. Mahmoud Mohammed Mahmoud, Aseel Ghazi. Endometrial histopathological changes in women with abnormal uterine bleeding in Kirkuk city. clinicopathological study. Medical Journal of Babylon 2013; vol 10:3.
18. PG Anastasiadis et al;. Descriptive epidemiology of endometrial hyperplasia in patients with abnormal uterine bleeding. Eur J Gynecol Oncol. 2000;21(20):131-4 .
19. Aliya Aslam , Gazala . Role of TVSin cases of abnormal uterine bleeding . Professional Med J. 2003; 53:170-7.
20. Heera Shenoy, Ranjana Balathil, Neena Mampilly, Rejeesh Saroja. Sonographic and histopathological findings endometrium among perimenopausal women with abnormal uterine bleeding – Across sectional study in North Kerala. Indian Journal of Obstet Gynecol . 2024; 11:2.