OPEN ACCESS

Scholars International Journal of Obstetrics and Gynecology

Abbreviated Key Title: Sch Int J Obstet Gynec
ISSN 2616-8235 (Print) |ISSN 2617-3492 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article

Correlation between Endometrial Thickness on Transvaginal Ultrasonography and Histopathological Findings in Postmenopausal Bleeding

Dr. Sanjana Rahman[1]*, Dr. Taslim Ara Nila[2], Dr. Alif Laila[1], Dr. Nargis Sultana[1], Dr. Fatema Akter[3], Dr. Umme Salma Shilpi[4], Dr. Tanzin Hossain[5]

[1]Registrar, Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital, Dhaka, Bangladesh
[2]Junior Consultant, Department of Obstetrics and Gynaecology, Shahid Syed Nazrul Islam Medical College Hospital, Kishoreganj, Bangladesh
[3]Registrar, Department of Obstetrics and Gynaecology, Shahid Syed Nazrul Islam Medical College Hospital, Kishoreganj, Bangladesh
[4]Medical Officer, Department of Obstetrics and Gynaecology, Kurmitola 500 Beded General Hospital, Dhaka, Bangladesh
[5]Medical Officer, Department of Obstetrics and Gynaecology, Kurmitola 500 Beded General Hospital, Dhaka, Bangladesh

DOI: https://doi.org/10.36348/sijog.2025.v08i05.007 | **Received:** 13.04.2025 | **Accepted:** 19.05.2025 | **Published:** 23.05.2025

***Corresponding author:** Dr. Sanjana Rahman
Registrar, Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital, Dhaka, Bangladesh

Abstract

***Background*:** Abnormal uterine bleeding in peri- and postmenopausal women often raises concern for underlying pathology such as endometrial hyperplasia or carcinoma. This study aimed to evaluate the correlation between endometrial thickness on transvaginal ultrasonography and histopathological findings in postmenopausal bleeding. ***Aim of the study*:** The aim of the study was to evaluate the correlation between endometrial thickness on transvaginal ultrasonography and histopathological findings in postmenopausal bleeding, identifying predictive relationships for clinical assessment. ***Methods*:** This cross-sectional study was conducted at the Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital (DMCH), Dhaka, Bangladesh, from June 2022 to May 2023, including 65 postmenopausal women with vaginal bleeding. Transvaginal ultrasonography (TVS) was performed to measure endometrial thickness, followed by fractional curettage for histopathological analysis at the Department of Pathology, DMC. Data were analyzed using SPSS version 26, and patients were categorized by endometrial thickness (≤5 mm or >5 mm), with statistical significance set at $p < 0.05$. ***Results*:** Among 65 postmenopausal bleeding patients, 58.5% had endometrial thickness >5 mm (mean 9.1 ± 6.1 mm). Histopathology showed 70.8% had abnormal findings, mainly endometrial hyperplasia (47.8%). A significant association ($p = 0.001$) was found between endometrial thickness and pathology, with >5 mm thickness linked to hyperplasia, carcinoma, and polyp, and ≤5 mm thickness linked to atrophy. ***Conclusion*:** Endometrial thickness on transvaginal ultrasonography is a significant predictor of endometrial pathology in postmenopausal bleeding, aiding in clinical assessment.

Keywords: Endometrial Thickness, Transvaginal Ultrasonography, Postmenopausal Bleeding, Histopathological Findings.

INTRODUCTION

The endometrium is a hormonally responsive tissue that undergoes cyclical changes throughout a woman's reproductive years [1]. During the perimenopausal phase—characterized by hormonal fluctuations and irregular menstrual cycles—abnormal uterine bleeding (AUB) is a common clinical concern. It represents a significant cause of gynecological consultations and is a leading indication for hysterectomy [2, 6]. The primary goal in evaluating AUB, particularly in perimenopausal and postmenopausal women, is to exclude serious pathologies such as endometrial hyperplasia and endometrial carcinoma [7]. Transvaginal sonography (TVS), a cost-effective, non-invasive, and readily accessible imaging technique, plays a pivotal role in assessing the endometrium [8]. With advancements in high-resolution transducers and Doppler technology, TVS can detect endometrial abnormalities—including focal or irregular thickening, heterogeneity, polypoid

lesions, and disruption of the subendometrial halo—even when the endometrial thickness appears within normal limits [9, 10].

Postmenopausal bleeding (PMB), characterized by any vaginal bleeding after a full year of amenorrhea, is considered an alarming symptom that requires immediate and comprehensive assessment [11, 12]. While PMB is frequently attributed to benign conditions such as atrophic endometrium or hormone replacement therapy, approximately 10–15% of cases are associated with endometrial cancer—a malignancy with rising incidence, particularly in developing regions [13]. Endometrial cancer is the most prevalent malignancy of the female genital tract and commonly presents with PMB. The risk increases with advancing age and prolonged exposure to unopposed estrogen [12]. TVS has become the first-line imaging modality for evaluating PMB, with endometrial thickness (ET) serving as a key diagnostic parameter [14]. An ET threshold of ≥5 mm is typically considered the criterion for further investigation, although overlap with benign lesions such as endometrial polyps may occur [15]. Hence, while TVS demonstrates high sensitivity, definitive diagnosis requires histopathological confirmation via endometrial biopsy [16].

Despite widespread use of TVS and recommendations from international guidelines regarding ET thresholds for further evaluation [17], no universally accepted cut-off exists—particularly in perimenopausal women. Most professional bodies, including ACOG and RCOG, advocate an ET threshold of 4–5 mm in postmenopausal women. However, regional variations in patient profiles and clinical settings underscore the need for locally relevant data to inform clinical decisions. Adjunct diagnostic procedures—such as saline infusion sonohysterography, hysteroscopy, and endometrial sampling (e.g.,aspiration biopsy or dilatation and curettage)—are employed to corroborate sonographic findings. In women aged 35 years and above presenting with AUB or in younger patients with persistent symptoms and risk factors, endometrial biopsy is recommended to exclude malignancy or premalignant conditions [16]. In conclusion, while TVS plays a critical role in the initial evaluation of AUB and PMB, its findings must be interpreted in conjunction with clinical history and histopathological results to ensure accurate diagnosis and management. Therefore, the purpose of this study was to assess the correlation between endometrial thickness on transvaginal ultrasonography and histopathological findings in postmenopausal bleeding, and to identify predictive relationships relevant for clinical practice.

Objective

- The aim of the study was to evaluate the correlation between endometrial thickness on transvaginal ultrasonography and histopathological findings in postmenopausal bleeding patient, identifying predictive relationships for clinical assessment.

METHODOLOGY & MATERIALS

This cross-sectional study was conducted at the Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital (DMCH), Dhaka, Bangladesh, from June 2022 to May 2023. A total of 65 postmenopausal women presenting with vaginal bleeding were included, selected based on specific inclusion criteria. Data were collected through transvaginal ultrasonography (TVS) and histopathological analysis to evaluate the correlation between endometrial thickness and pathological findings.

Inclusion Criteria:

- Postmenopausal women presenting with vaginal bleeding
- Willingness to participate in the study

Exclusion Criteria:

- Women on menopausal hormone therapy (MHT)
- Diagnosed cases of endometrial carcinoma
- Diagnosed cases of vulvar, vaginal or cervical cancer
- Diagnosed cases of cervical polyp or myomatous polyp
- Patients unwilling to provide informed consent

After obtaining ethical approval from the Ethical Review Committee of Dhaka Medical College, data were collected from 65 postmenopausal women attending the outpatient department. Informed written consent was obtained after explaining the study's objectives and procedures. Detailed demographic and clinical information—including menstrual, obstetric, and gynecological history—was gathered using a structured questionnaire and interview schedule. Each participant underwent general physical examination followed by per abdominal, per speculum, and per vaginal examinations. TVS was performed by a trained sonologist at the Department of Nuclear Medicine and Allied Sciences using a high-frequency vaginal transducer in lithotomy position to measure endometrial thickness at its maximum point in the sagittal plane. Fractional curettage was subsequently performed under general anesthesia or deep sedation, with separate endocervical and endometrial samples collected for histopathological analysis at the Department of Pathology, DMC. Data were entered and analyzed using SPSS version 26. Descriptive statistics were used to summarize demographic variables. Based on TVS findings, patients were categorized into two groups: Group 1 (endometrial thickness ≤5 mm) and Group 2 (>5 mm). A p-value of <0.05 was considered statistically significant.

RESULTS

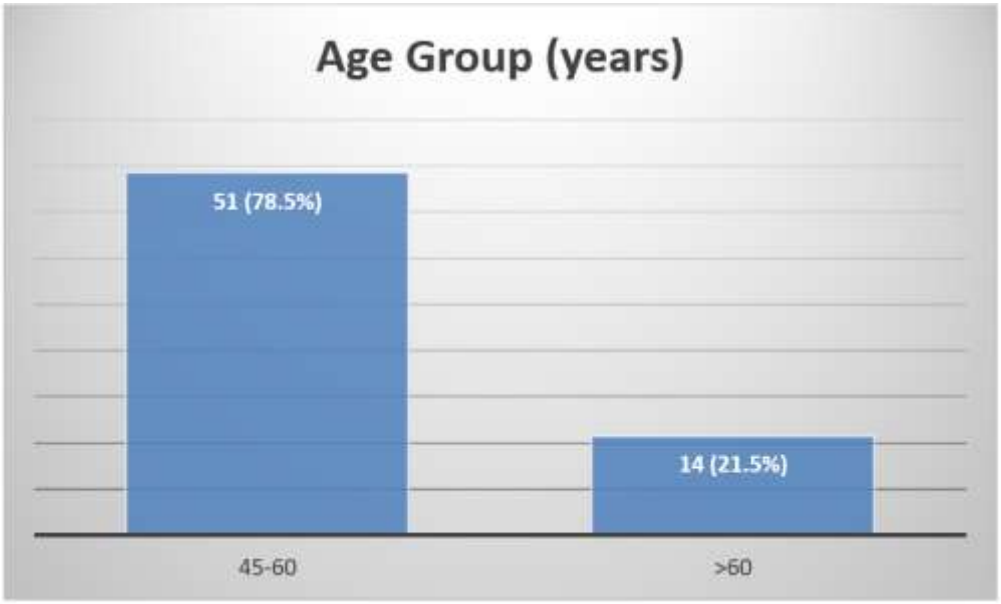

Figure 1: Age Distribution of Patients with Postmenopausal Bleeding (n = 65)

The majority of patients (78.5%) presenting with postmenopausal bleeding were within the 45–60 years age group, while 21.5% were older than 60 years. The mean age was 55.5 ± 7.6 years.

Table 1: Distribution of Endometrial Thickness on Transvaginal Ultrasonography (n = 65)

Endometrial Thickness	Frequency (N)	Percentage (%)
>5 mm	38	58.50%
≤5 mm	27	41.50%
Mean ± SD (mm)	9.1 ± 6.1	

More than half of the patients (58.5%) had an endometrial thickness greater than 5 mm, while 41.5% had a thickness of 5 mm or less. The mean endometrial thickness was 9.1 ± 6.1 mm.

Table 2: Distribution of Histopathological Findings in Patients with Postmenopausal Bleeding (n = 65)

Histopathological Findings	Frequency (N)	Percentage (%)
Abnormal	46	70.80%
– Endometrial Hyperplasia	22	47.80%
– Endometrial Atrophy	11	23.90%
– Endometrial Carcinoma	6	13.10%
– Endometrial Polyp	7	15.20%
Normal	19	29.20%

Histopathological examination revealed that 70.8% of patients had abnormal endometrial findings. Among these, endometrial hyperplasia was the most common (47.8%), followed by endometrial atrophy (23.9%), endometrial polyp (15.2%), and endometrial carcinoma (13.1%). Normal endometrium was observed in 29.2% of patients.

Table 3: Association Between Endometrial Thickness on TVS and Histopathological Findings (n = 65)

Endometrial Thickness on TVS	Abnormal Pathology (n = 46) *N (%)*	No Pathology (n = 19) *N (%)*	*P-value*
>5 mm	33 (73.9%)	5 (21.1%)	0.001
≤5 mm	13 (26.1%)	14 (78.9%)	

A statistically significant association was observed between endometrial thickness on transvaginal ultrasonography (TVS) and histopathological findings (p = 0.001). Among patients with abnormal endometrial pathology, 73.9% had an endometrial thickness >5 mm, whereas the majority (78.9%) of patients with no pathology had a thickness ≤5 mm.

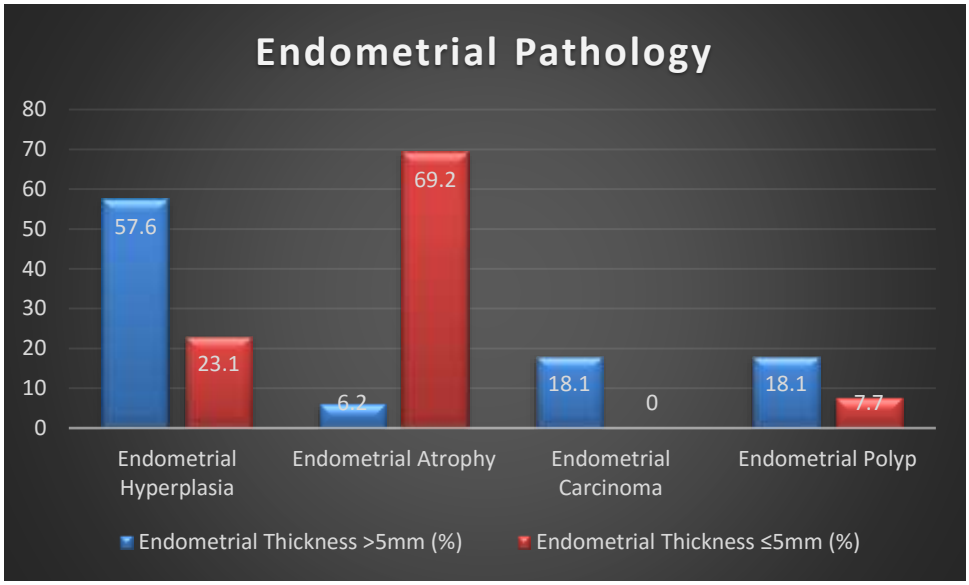

Figure-2: Distribution of Different Types of Endometrial Pathology According to Endometrial Thickness on Transvaginal Ultrasonography (n=46)

Endometrial hyperplasia (57.6%), endometrial polyp (18.1%), and endometrial carcinoma (18.1%) were significantly more common among patients with endometrial thickness >5 mm on TVS. In contrast, endometrial atrophy (69.2%) was significantly higher in patients with endometrial thickness ≤5 mm ($p < 0.05$).

DISCUSSION

Postmenopausal bleeding (PMB) is a frequent clinical concern and a potential indicator of underlying endometrial pathology, including malignancy. Transvaginal ultrasonography (TVS) is commonly employed as a non-invasive first-line diagnostic method to measure endometrial thickness (ET), while histopathological examination remains the gold standard for a definitive diagnosis. Histopathological evaluation is considered the gold standard for providing a definitive diagnosis. The present study aimed to assess the correlation between ET on TVS and histopathological findings in women presenting with PMB. A total of 65 postmenopausal women were enrolled at the Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital. Patients were classified into two groups based on sonographic findings: Group 1 (ET ≤5 mm) and Group 2 (ET >5 mm).

In this study, the majority of patients presenting with postmenopausal bleeding were within the 45–60 years age group (78.5%), with a mean age of 55.5 ± 7.6 years, which is consistent with findings from previous studies. Talwar *et al*. [18] observed that the majority of women with postmenopausal bleeding were aged between 50–54 years (54.16%) and 55–59 years (25.83%), with a mean age of 54.97 ± 5.85 years, aligning closely with our results. Similarly, Lavanya *et al*. [19] found that 56% of women presenting with postmenopausal bleeding were aged between 50–60 years, further supporting the trend that postmenopausal bleeding predominantly affects women in this age group. These findings suggest that postmenopausal bleeding is most common in women aged 45–60 years, highlighting the relevance of this age group in clinical evaluations and the need for careful assessment of potential underlying causes, including endometrial pathologies, in this population.

In this study, the mean endometrial thickness (ET) was 9.1 ± 6.1 mm, and 58.5% of postmenopausal women with vaginal bleeding had an ET exceeding 5 mm. These findings are in line with those reported in similar studies. Patel *et al*. [20] observed that women with benign or atrophic endometrium had a mean ET of 7.5 mm, which increased significantly to 16.9 mm in cases of endometrial carcinoma, in contrast, Karlsson *et al*. [21] reported a broad range of endometrial thickness (ET) measurements, from 3.9 mm in cases of atrophic endometrium to 21.1 mm in cases of endometrial cancer. These studies emphasize the clinical significance of ET as a key parameter for evaluating postmenopausal bleeding. In our study, the higher percentage (58.5%) of women with ET >5 mm suggests a potential risk for pathologic conditions, underscoring the need for histopathological evaluation to confirm diagnoses and guide management, particularly in distinguishing benign from malignant causes of postmenopausal bleeding.

In this study, the histopathological findings in patients with postmenopausal bleeding revealed that a majority of cases (70.8%) had abnormal results, with endometrial hyperplasia being the most common pathology (47.8%), followed by endometrial atrophy (23.9%), endometrial carcinoma (13.1%), and endometrial polyps (15.2%). These findings are in line with previous studies, such as that of Lakhey *et al*. [22], who reported that endometrial hyperplasia without atypia was the leading cause of postmenopausal

bleeding, followed by atrophic endometrium, endometrial polyps, and endometrial carcinoma. Similarly, Kumari *et al*. [23] found that endometrial atrophy was the most prevalent histopathological finding, comprising 60–80% of cases, with endometrial hyperplasia and carcinoma being less frequent. The higher incidence of endometrial hyperplasia in our study could be attributed to a more diverse population or differences in the patient selection criteria. However, the overall distribution of pathologies observed in this study supports the existing literature on the common histopathological causes of postmenopausal bleeding, emphasizing the importance of distinguishing between benign and malignant conditions for accurate diagnosis and treatment.

In this study, a significant association was found between endometrial thickness (ET) on transvaginal ultrasonography (TVS) and histopathological findings. In the study of 65 postmenopausal women, 73.9% of those with an endometrial thickness (ET) greater than 5 mm exhibited abnormal pathology, whereas only 26.1% of those with an ET of 5 mm or less had abnormal pathology. These findings are consistent with the study by Krishnamoorthy *et al*. [24], which reported that none of the cases with an ET less than 4 mm had endometrial hyperplasia or carcinoma, suggesting that a thinner endometrium may exclude these pathologies. Furthermore, Chaudhari *et al*. [25] observed that an ET greater than 4 mm was more likely to indicate endometrial hyperplasia or carcinoma, reinforcing the clinical importance of ET measurements in evaluating postmenopausal bleeding. Our study supports these observations by demonstrating that thicker endometria (ET >5 mm) are strongly associated with abnormal histopathological findings, emphasizing the value of TVS as a diagnostic tool in the early detection of endometrial abnormalities in postmenopausal women.

In this study, the relationship between endometrial thickness (ET) measured by transvaginal ultrasonography (TVS) and histopathological findings was assessed in postmenopausal women presenting with vaginal bleeding. Our results showed that endometrial hyperplasia (57.6%), endometrial polyp (18.1%), and endometrial carcinoma (18.1%) were significantly more common in patients with an ET >5 mm, while endometrial atrophy (69.2%) was more prevalent in those with ET ≤5 mm. This finding aligns with the study by Shyoran *et al*. [26], which found that among cases with ET ≤5 mm, 85.96% were normal, and only 14.04% exhibited abnormal findings. Similarly, other studies have reported that a thicker endometrium is strongly associated with abnormal histopathological findings such as hyperplasia and carcinoma, while a thinner endometrium is more likely to indicate atrophy. The significant difference in the distribution of endometrial pathologies based on ET in our study highlights the importance of using TVS measurements to identify potential underlying conditions in postmenopausal bleeding, offering a non-invasive tool to guide further diagnostic and therapeutic decisions.

Limitations of the study

This study had some limitations:

- The study was conducted in a single tertiary care hospital.
- Participants were selected purposively, not randomly.
- The study lacked a control group of healthy postmenopausal women for comparative analysis.

CONCLUSION

This study shows a significant correlation between endometrial thickness on transvaginal ultrasonography (TVS) and histopathological findings in postmenopausal bleeding. A thickness greater than 5 mm was associated with higher rates of endometrial hyperplasia, polyp, and carcinoma, while a thickness of 5 mm or less was linked to endometrial atrophy. These findings highlight the potential of TVS as an effective tool for predicting endometrial pathology in postmenopausal women, aiding in clinical decision-making.

REFERENCES

- Giri SK, Nayak BL, Mohapatra J. Thickened endometrium: when to intervene? A clinical conundrum. The Journal of Obstetrics and Gynecology of India. 2021 Jun;71(3):216-25.
- Kumari P, Gaikwad HS, Nath B. Endometrial Cut Off Thickness as Predictor of Endometrial Pathology in Perimenopausal Women with Abnormal Uterine Bleeding: A Cross-Sectional Study. Obstetrics and gynecology international. 2022;2022(1):5073944.
- Lohith HM, Anjali R. Evaluation and histopathological correlation of abnormal uterine bleeding in menopausal transition in a tertiary care centre at Cheluvamba hospital, Mysore. Int J Clin Obstet Gynaecol. 2019;3(6):9-14.
- Sur D, Chakravorty R. Correlation of endometrial thickness and histopathology in women with abnormal uterine bleeding. Reprod Syst Sex Disord. 2016 Sep 30;5(4):1-3.
- Pillai SS. Sonographic and histopathological correlation and evaluation of endometrium in perimenopausal women with abnormal uterine bleeding. Int J Reprod Contracept Obstet Gynecol. 2014 Mar 1;3(1):113-7.
- Modak R, Pal A, Pal A, Bose K. Abnormal uterine bleeding in perimenopausal women: sonographic and histopathological correlation and evaluation of uterine endometrium. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2020 May 1;9(5):1959-65.

- Goodman A. Postmenopausal uterine bleeding. UpToDate. Accessed online June. 2014;16(3):54-.
- Amer AS, Diab YM, Fotouh AM. Comparison Between Endometrial Thickness by TVS And Endometrial Histopathology in Postmenopausal Women. Al-Azhar International Medical Journal. 2024;5(3):48.
- Rezvani M, Winter CT. Abnormal uterine bleeding: the role of ultrasound. Callen's ultrasonography in obstetrics and gynecology. 2017; 6:805-34.
- Gupta A, Desai A, Bhatt S. Imaging of the endometrium: physiologic changes and diseases: women's imaging. Radiographics. 2017 Nov;37(7):2206-7.
- Ozer A, Ozer S, Kanat-Pektas M. Correlation between transvaginal ultrasound measured endometrial thickness and histopathological findings in Turkish women with abnormal uterine bleeding. Journal of Obstetrics and Gynaecology Research. 2016 May;42(5):573-8.
- Parazzini F, La Vecchia C, Bocciolone L, Franceschi S. The epidemiology of endometrial cancer. Gynecologic oncology. 1991 Apr 1;41(1):1-6.
- Mohamed A, Elgarhy IT, Elboghdady AA. Relationship between transvaginal ultrasound endometrial thickness, body mass index and endometrial pathology in women with post-menopausal bleeding. Al-Azhar International Medical Journal. 2021 Jun 1;2(6):33-40.
- Khalil Abd El-Shafi A, Talaat El-Garhy I, Mohamed Labeb M, Osama Abd El-Motaal A. Comparison between 2d transvaginal ultrasonography and hysteroscopy in detection of intrauterine pathology in patients with infertility. Al-Azhar Medical Journal. 2022 Jan 1;51(1):309-20.
- Allan A, Joseph A, Orang'o O. Pelvic ultrasound and histopathological findings in post-menopausal patients with uterine bleeding in Western Kenya. Journal of Scientific and Innovative Research. 2022;11(1):17-20.
- Singh P. Abnormal uterine bleeding-evaluation by endometrial aspiration. Journal of mid-life health. 2018 Jan 1;9(1):32-5.
- Lavanya Kumari S, Hafsa A. A Study on Correlation of Endometrial Thickness and its Histopathological Finding in Women with Postmenopausal Bleeding.
- Talwar S, Kaur H, Tapasvi I, Nibhoria S, Tapasvi C. Clinical and Histopathological Characteristics in Women with Postmenopausal Bleeding: A Study of 120 Women in a Tertiary Care Hospital in Punjab. Cureus. 2024 Jan 5;16(1): e51690.
- Lavanya S, Munivenkatappa S, Sravanthi AJ. A two-year study on postmenopausal bleeding at a tertiary institute. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2021 Feb 1;10(2):479-84.
- Patel V, Wilkinson EJ, Chamala S, Lu X, Castagno J, Rush D. Endometrial Thickness as Measured by Transvaginal Ultrasound and the Corresponding Histopathologic Diagnosis in Women with Postmenopausal Bleeding. Int J Gynecol Pathol. 2017 Jul;36(4):348-355.
- Karlsson B, Granberg S, Wikland M, Ylöstalo P, Torvid K, Marsal K, Valentin L. Transvaginal ultrasonography of the endometrium in women with postmenopausal bleeding--a Nordic multicenter study. Am J Obstet Gynecol. 1995 May;172(5):1488-94.
- Krishnamoorthy P, Balakrishnan N, Prasad G. Association of Endometrial Thickness with Histopathological Pattern of Endometrium with Postmenopausal Bleeding. Journal of SAFOMS. 2018 Dec 1;6(2):112-6.
- Chaudhari L, Satia MN. To study the correlation between endometrial thickness on transvaginal sonography and endometrial histopathology in women with postmenopausal bleeding. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2016 May 1;5(5):1309-16.
- Lakhey A, Priyadarsinee A, Regmi S, Acharya S. Histopathological Findings in Postmenopausal Bleeding. Journal of National Medical College. 2023 Jul 30;8(1):48-52.
- Kumari K, Paswan MK, Kundan M, Ambedkar SN. A prospective study of endometrial histopathology in post-menopausal women in Jharkhand. Journal of Family Medicine and Primary Care. 2024 May 1;13(5):1696-700.
- Shyoran S, Dhaka S, Deora RK, Jodha BS. Observational study of correlation of endometrial thickness and endometrial histopathology in women with postmenopausal bleeding. Int J Curr Pharm Rev Res. 2024;16(12):60-67.