International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Akter K et al. Int J Reprod Contracept Obstet Gynecol. 2026 Oct;15(10):3811-3817
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20263410

Original Research Article

Role of transvaginal ultrasound in diagnosis of adenomyosis, leiomyoma, or both in comparison with histopathological findings

Khadiza Akter[1]*, Faima Khatun[2], Rukshana Haque Urmi[1], Umme Sakia Kauser[3], Shahrina Alam[4]

[1]Department of Obstetrics and Gynecology, United Healthcare Services Ltd, Dhaka, Bangladesh
[2]Department of Obstetrics and Gynecology, BRB Hospital Limited, Dhaka, Bangladesh
[3]Directorate General of Health Services (DGHS), Dhaka, Bangladesh
[4]Department of Obstetrics and Gynecology, BIRDEM Academy, Dhaka, Bangladesh

Received: 22 August 2026
Accepted: 21 September 2026

***Correspondence:**
Dr. Khadiza Akter,
E-mail: drkhadiza802@gmail.com

ABSTRACT

Background: Adenomyosis and leiomyoma are common benign uterine disorders associated with abnormal uterine bleeding, dysmenorrhea, pelvic pain, infertility, and reduced quality of life. As treatment strategies differ between these conditions, accurate preoperative diagnosis is essential. Transvaginal ultrasonography (TVS) is a widely available, cost-effective imaging modality, while histopathology remains the gold standard for diagnosis.
Methods: This analytical cross-sectional study was conducted in the Department of Obstetrics and Gynecology, BIRDEM General Hospital, Dhaka, from January 2023 to June 2024. A total of 150 women aged 30–55 years with a TVS diagnosis of adenomyosis, leiomyoma, or both who subsequently underwent hysterectomy, myomectomy, or adenomyomectomy were included. TVS findings were compared with histopathological examination. Data were analyzed using SPSS version 26.0.
Results: The mean age was comparable among the three groups ($p=0.523$). Women with adenomyosis more frequently had regular menstrual cycles and average menstrual flow, whereas heavy menstrual bleeding was more common in women with leiomyoma and combined disease ($p<0.0001$). Severe dysmenorrhea was significantly associated with adenomyosis and combined disease ($p<0.0001$). Histopathology confirmed 15 of 19 TVS-diagnosed adenomyosis cases, 78 of 92 leiomyoma cases, and 34 of 39 combined cases (all $p<0.0001$). For the diagnosis of combined adenomyosis and leiomyoma, TVS demonstrated a sensitivity of 70.8%, specificity of 95.0%, positive predictive value of 87.1%, negative predictive value of 87.3%, and overall accuracy of 87.3%.
Conclusion: Transvaginal ultrasonography is a reliable, accurate, and cost-effective diagnostic tool for identifying adenomyosis, leiomyoma, and their coexistence, showing excellent agreement with histopathological findings.

Keywords: Adenomyosis, Leiomyoma, Transvaginal ultrasonography, Histopathology, Diagnostic accuracy

INTRODUCTION

Adenomyosis is a common gynecological condition in which endometrial glands and stroma infiltrate the myometrium. It is defined as the benign invasion of endometrial tissue into the myometrium, resulting in a diffusely enlarged uterus with ectopic endometrial glands and stroma surrounded by hypertrophic and hyperplastic myometrium.[1,2] Women with adenomyosis commonly present with dysmenorrhea, heavy menstrual bleeding, chronic pelvic pain, and an enlarged uterus, which can significantly impair quality of life.[1] Although its exact etiology remains unclear, hormonal factors including estrogen and progesterone are thought to contribute to its development.[3] Uterine leiomyomas (fibroids) are the most

common benign gynecological tumors, affecting approximately 20–50% of women worldwide.[4] They arise from smooth muscle cells of the myometrium and may be asymptomatic or present with abnormal uterine bleeding, pelvic pain, infertility, and uterine enlargement. On ultrasonography, leiomyomas typically appear as well-defined solid masses with posterior acoustic shadowing, although degenerative changes may make diagnosis difficult.[5] They are hormone-dependent tumors that usually enlarge during pregnancy and regress after menopause.[4]

Adenomyosis and leiomyoma frequently coexist and share similar clinical manifestations, including menorrhagia, dysmenorrhea, anemia, infertility, and uterine enlargement, making preoperative differentiation challenging.[6] Accurate diagnosis is important because management differs between the two conditions, with conservative treatment often preferred for adenomyosis and surgical intervention more commonly indicated for leiomyoma or combined disease.[6]

Ultrasonography is the primary imaging modality for evaluating uterine pathology. Among available techniques, transvaginal ultrasonography (TVU) provides better visualization than transabdominal ultrasonography, particularly for small lesions and retroverted uteri, although it remains operator dependent.[7] TVU is also more accessible and cost-effective than magnetic resonance imaging (MRI) while offering good diagnostic performance, with a reported sensitivity of 84.55% for adenomyosis.[6] The introduction of two-dimensional and three-dimensional TVU has further improved diagnostic accuracy by identifying characteristic features such as a globular uterus, heterogeneous myometrium, myometrial cysts, asymmetrical wall thickening, and junctional zone abnormalities.[8,9]

Despite these advances, histopathological examination remains the gold standard for diagnosing both adenomyosis and leiomyoma. Histologically, adenomyosis is characterized by ectopic endometrial glands and stroma within the myometrium, whereas leiomyomas consist of benign spindle-shaped smooth muscle cells with varying amounts of fibrous connective tissue.[10-12]

The objective of this study was to evaluate the effectiveness of transvaginal ultrasound in diagnosing adenomyosis, leiomyoma, or both, in comparison with histopathological findings.

METHODS

This analytical cross-sectional study was conducted in the Department of Obstetrics and Gynecology, Bangladesh institute of research and rehabilitation in diabetes, endocrine and metabolic disorders (BIRDEM) General Hospital, Dhaka, from January 2023 to June 2024. A total of 150 women aged 30–55 years with a TVS diagnosis of adenomyosis, leiomyoma, or both, who subsequently underwent hysterectomy, myomectomy, or adenomyomectomy and had available histopathological reports, were enrolled by purposive sampling. Postmenopausal women, patients with a uterus larger than 16 weeks, uterine malignancy, endometriosis, or pelvic inflammatory disease were excluded.

Data on sociodemographic characteristics, menstrual and obstetric history, symptoms, TVS findings, and histopathological reports were collected using a pretested semi-structured questionnaire. TVS examinations were performed before surgery using a LOGIQ 9 ultrasound system (GE Healthcare, Milwaukee, WI, USA) with a 7–9 MHz endovaginal probe, including color Doppler assessment. Images were interpreted by the same investigator with five years of experience in female pelvic sonography to minimize interobserver variation. Sonographic evaluation included myometrial echotexture, uterine wall symmetry, uterine size, lesion location, vascularity, and associated abnormalities. Adenomyosis and leiomyoma were diagnosed based on established sonographic criteria described by Hanafi (2013b). Histopathological examination of all surgical specimens was performed by hospital pathologists and served as the reference standard.

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 26.0. Descriptive statistics were expressed as frequency, percentage, and mean±standard deviation. Chi-square test, Fisher's exact test, and one-way ANOVA were used where appropriate to assess associations. A p value of <0.05 was considered statistically significant. Ethical approval was obtained from the institutional review board of BIRDEM General Hospital, and written informed consent was obtained from all participants in accordance with the Declaration of Helsinki.

RESULTS

This analytical cross-sectional study was conducted to diagnose of adenomyosis, leiomyoma, or combined adenomyosis and leiomyoma by the use of TVS which was compared with histopathological findings. A total of 150 women who underwent hysterectomy or myomectomy or adenomyomectomy due to leiomyoma, adenomyosis or combined in the inpatient department of obstetrics and gynecology, BIRDEM general hospital were enrolled for the study. The results, including tables, are presented within this chapter.

Table 1 shows that the mean age was similar across groups (adenomyosis: 42.7±2.3 years, leiomyoma: 41.3±3.6 years, combination: 45.2±2.0 years; p=0.523). In terms of education, most had a Class I-V education (adenomyosis: 36.8%, leiomyoma: 45.6%, combination: 46.2%; p=0.177). The majority were housewives (adenomyosis: 94.7%, leiomyoma: 42.6%, combination: 84.6%; p=0.042). The mean monthly income varied slightly

(adenomyosis: 40,473.7±5,368.3, leiomyoma: 45,695.7±5,395.8, combination: 38,230.7±7,001.7; p=0.074). BMI averages are similar across groups, approximately 23.7±1.3 for Adenomyosis, 26.3±1.3 for Leiomyoma and 25.8±1.3 for the combination group (p=0.774). Table 2 shows that women with adenomyosis had more regular menstrual cycles (78.9%) compared to those with leiomyoma (33.7%) and those with both conditions (10.3%) (p<0.0001). Women with adenomyosis also mostly experienced average menstrual flow (89.5%), whereas those with leiomyoma and both conditions more frequently reported heavy flow (69.6% and 51.3%, respectively) (p<0.0001). In case of parity, most of the patients were multiparas, adenomyosis 78.9%, leiomyoma 57.1%, and combination 79.4% (p value 0.0005).

Table 1: Categorization of the respondents according to sociodemographic characteristic by groups.

Sociodemographic characteristic	Adenomyosis (n=19)	Leiomyoma (n=92)	Combination of adenomyosis and leiomyoma (n=39)	P value
Age				
Mean±SD	42.7±2.3	41.3±3.6	45.2±2.0	0.523[c]
Educational qualification				
Class I-V	7 (36.8)	42 (45.6)	18 (46.2)	0.177*
Class VI-X	5 (26.3)	30 (32.6)	14 (35.9)	
Class XI-XII	5 (26.3)	16 (17.3)	3 (7.7)	
Graduate	2 (10.5)	4 (4.3)	2 (10.3)	
Occupation				
Housewife	18 (94.7)	76 (42.6)	33 (84.6)	0.042*
Working woman	1 (5.3)	15 (16.3)	6 (15.4)	
Monthly income				
Mean±SD	40473.7±5368.3	45695.7±5395.8	38230.7±7001.7	0.074[c]
BMI (Mean±SD)	23.7±1.3	26.3±1.3	25.8±1.3	0.774[c]

cANOVA test, * Fisher's Exact test.

Table 2: Comparison of menstrual history and obstetric history among women with adenomyosis, leiomyoma, and both conditions.

Menstrual history and obstetric history	Adenomyosis (n=19)	Leiomyoma (n=92)	Combination of adenomyosis and leiomyoma (n=39)	P value
Menstrual cycle				
Regular	15 (78.9)	31 (33.7)	4 (10.3)	<0.0001*
Irregular	4 (21.1)	61 (66.3)	35 (89.7)	
Menstrual blood flow				
Light	0 (0.0)	1 (1.1)	0 (0.0)	<0.0001*
Average	17 (89.5)	27 (29.3)	19 (48.7)	
Heavy	2 (10.5)	64 (69.6)	20 (51.3)	
Para				
Nullipara	2 (10.5)	4 (4.3)	0 (0.0)	0.0005[a]
Primipara	2 (10.5)	35 (38.4)	7 (17.9)	
Multipara	15 (78.9)	52 (57.1)	31 (79.4)	

* Fisher's Exact test, aChi-square test.

Table 3: Comparison of symptoms among women with adenomyosis, leiomyoma, and both conditions.

Symptoms	Adenomyosis (n=19)	Leiomyoma (n=92)	Combination of adenomyosis and leiomyoma (n=39)	P value
Dysmenorrhea				
None	0 (0.0)	2 (2.2)	1 (2.6)	<0.0001*
Mild	2 (10.5)	39 (42.4)	4 (10.3)	
Moderate	10 (52.6)	50 (54.3)	20 (51.3)	

Symptoms	Adenomyosis (n=19)	Leiomyoma (n=92)	Combination of adenomyosis and leiomyoma (n=39)	P value
Severe	7 (36.8)	1 (1.1)	14 (35.9)	
Dyspareunia				
None	17 (89.5)	87 (94.6)	17 (43.6)	<0.0001*
Mild	2 (10.5)	5 (5.4)	22 (56.4)	

* Fisher's Exact test.

Table 4: Total number of TVS diagnosis of adenomyosis, leiomyoma, or both and its correlation with histopathological diagnosis (n=150).

TVS diagnosis	TVS diagnosis correlates with histopathology	TVS diagnosis not correlates with histopathology	
Adenomyosis 19	15	04	Both 03
			Leiomyoma 01
			Others 00
Leiomyoma 92	78	14	Both 11
			Adenomyosis 02
			Others 01
Both (adenomyosis and leiomyoma) 39	34	05	Adenomyosis 01
			Leiomyoma 03
			Others 01

Table 5: Comparison of TVS findings with histopathology for diagnosis of adenomyosis.

TVS (adenomyosis)	Histopathology (adenomyosis)		P value
	Yes	**No**	
Yes	15 (83.3)	4 (3.0)	<0.0001[s]
No	3 (16.7)	128 (97.0)	

S=significant value obtained from *Fisher's Exact test

Table 6: Comparison of TVS findings with histopathology for diagnosis of leiomyoma.

TVS (Leiomyoma)	Histopathology (Leiomyoma)		P value
	Yes	**No**	
Yes	78 (95.1)	14 (20.5)	<0.0001[s]
No	4 (4.8)	54 (79.4)	

S=significant value obtained from aChi-square test

Table 7: Comparison of TVS findings with histopathology for diagnosis of combined adenomyosis and leiomyoma.

TVS (combination of adenomyosis and leiomyoma)	Histopathology (combination of adenomyosis and leiomyoma)		P value
	Yes	**No**	
Yes	34 (70.9)	5 (5.0)	<0.0001[s]
No	14 (29.1)	97 (95.0)	

S= significant value obtained from * Fisher's Exact test

Table 8: Diagnostic validity test of TVS findings of combination of adenomyosis and leiomyoma with histopathology.

Statistic	Value (95% CI)
Sensitivity	70.8 % (56.8- 83.4)
Specificity	95.0 % (89.1 – 98.4)
Positive predictive value	87.1 % (73.9– 94.3)
Negative predictive value	87.3 % (81.6 – 91.0)
Accuracy	87.3 % (80.2 – 93.2)

Table 3 shows the comparison of symptoms revealed that dysmenorrhea was more severe in women with adenomyosis and those with both adenomyosis and leiomyoma, while those with leiomyoma reported less severe dysmenorrhea (p<0.0001). Most women with adenomyosis and leiomyoma experienced no dyspareunia, while a significant proportion of those with both conditions reported mild dyspareunia (p<0.0001).

Table 4 shows that, when TVS indicated the presence of adenomyosis 19 cases, 15 cases were confirmed as positive by histopathology, while 4 cases were negative. When TVS diagnosed leiomyoma 92 cases, 78 cases were confirmed as positive by histopathology, 14 cases were negative. Both adenomyosis and leiomyoma detected by TVS 39 cases and their confirmation through histopathology 34 cases, 5 cases were negative. Table 5 shows that, when TVS diagnosed the adenomyosis, 15 cases were confirmed as positive by histopathology, while 4 cases were negative. In contrast, when TVS did not diagnose adenomyosis, 3 cases were positive and 128 were negative for only adenomyosis. The results revealed a statistically significant association with a p value of less than 0.0001.

Table 6 shows a significant association between positive findings of Leiomyoma by TVS confirmation through histopathology. In this table, when TVS diagnosed leiomyoma, 78 cases were confirmed as positive by histopathology, while 14 cases were negative. Conversely, when TVS did not diagnose leiomyoma, 4 cases were positive and 54 were negative for only leiomyoma. The results demonstrated a statistically significant association with a p value of less than 0.0001.

Table 7 illustrates a significant correlation between positive findings of adenomyosis and leiomyoma detected by TVS and their confirmation through histopathology. Of the 39 cases identified as positive by TVS, 34 were confirmed through histopathological examination and 5 were negative. Furthermore, when TVS didn't diagnose both adenomyosis and leiomyoma, 14 cases were positive and 97 were negative. The results revealed a statistically significant association with a p value of less than 0.0001.

Table 8 presents diagnostic validity measures for TVS findings of both adenomyosis and leiomyoma compared to histopathology, showing moderate sensitivity (70.8%), high specificity (95.0%), positive predictive value (87.1%), negative predictive value (87.3%), and accuracy (87.3%).

DISCUSSION

In present study, the mean age was similar across all groups, with no significant differences observed. Most respondents had an education level of Class I-V, with comparable distributions among the groups. A significantly higher percentage of housewives were in the leiomyoma group compared to the other groups. The average monthly incomes were also similar across the groups. These findings suggest that there are no major demographic differences among the groups, indicating that the observed variations were likely not due to age, education, or income levels. A study conducted by price, reported the mean ages, education levels, and monthly incomes were similar across all groups, while a significantly higher percentage of housewives were found in the Leiomyoma group compared to the other groups.13 Another study revealed that, the majority of women were in the 41 to 46 age group, followed by those in the 46 to 50 age group. Most of the women were multiparous, with only a few being nulliparous.[14]

In this study, among the respondents, the majority (61.33%) had leiomyoma, followed by 26.00% who had both adenomyosis and leiomyoma, and 12.67% had only adenomyosis. This distribution may be due to the higher prevalence of leiomyoma in the general population, as well as the overlap in risk factors for both conditions, such as hormonal imbalances and genetic predispositions. Gopinath et al and Vaidya in their study observed adenomyosis 16.8% which was consistent with present study.[14]

Women with adenomyosis had more regular menstrual cycles (78.9%) compared to those with leiomyoma (33.7%) and those with both conditions (10.3%) (p<0.0001). Additionally, women with adenomyosis predominantly experienced average menstrual flow (89.5%), while those with leiomyoma and both conditions were more likely to report heavy flow (69.6% and 51.3%, respectively) (p<0.0001). Both conditions can disrupt normal uterine function, leading to irregular cycles and variations in menstrual flow. Nnoaham et al in their study reported that all groups, including those with adenomyosis, leiomyoma, and both conditions combined, experienced irregular menstrual cycles, which aligns with findings that these conditions affect uterine function and menstrual regularity. However, the mean age of menarche was consistent across all groups, indicating that the onset of menstruation was not significantly influenced by adenomyosis or leiomyoma.[15]

The symptoms comparison showed that dysmenorrhea was more severe in women with adenomyosis and those with both adenomyosis and leiomyoma, while women with leiomyoma experienced less severe dysmenorrhea (p<0.0001). Most women with adenomyosis or leiomyoma did not experience dyspareunia, whereas a significant proportion of those with both conditions reported mild dyspareunia (p<0.0001). In case of parity, most of the patients were multiparas, adenomyosis 78.9%, leiomyoma 57.1%, and combination 79.4% (p value 0.0005).

These findings likely reflect the distinct ways in which adenomyosis and leiomyoma affect pain and discomfort. Adenomyosis tends to be associated with more pronounced dysmenorrhea and dyspareunia due to its impact on uterine tissue and surrounding structures, while

leiomyoma may lead to less severe pain but can still affect menstrual and sexual symptoms. A study revealed that women with adenomyosis might experience symptoms such as AUB, dysmenorrhea, dyspareunia, or infertility. However, about one-third of these women may be asymptomatic which was consistent with present study.[16] In this study most of the patient underwent through hysterectomy. Hysterectomy done in case of adenomyosis 78.9%, leiomyoma 69.5% and combination 100% (p=<0.0001).

The diagnostic validity measures for TVS findings of leiomyoma compared to histopathology indicated moderate sensitivity 70.8%, high specificity 95.0%, a positive predictive value of 87.1%, a negative predictive value of 87.3%, and overall accuracy of 87.3%. In a similar study Hanafi informed that, TVS was sensitive but not specific for diagnosing adenomyosis. In contrast, TVS proved to be both sensitive and specific for diagnosing leiomyoma and cases with both adenomyosis and leiomyoma.

This study highlights that TVS is a valuable noninvasive tool for diagnosing leiomyoma and combined adenomyosis and leiomyoma, though it lacks specificity when used solely for diagnosing adenomyosis.[6] In another study, Bazot et al found that transvaginal sonography achieved high diagnostic accuracy for adenomyosis, with sensitivity at 65.0%, specificity at 97.5%, PPV at 92.8%, and NPV at 88.8% which supports the findings of present study.[17] These results likely reflect the technique's strong ability to accurately identify cases of adenomyosis, particularly due to its high specificity which minimizes false positives. The moderate sensitivity suggests that while TVS is effective at confirming adenomyosis, it may not detect all cases. Kepkep et al in a study revealed TVS for diagnosing adenomyosis had a sensitivity of 80.8%, specificity of 61.4%, NPV of 55.3%, and PPV of 84.4%, with an overall accuracy of 68.6%.[18]

In present study, TVS is highly effective for diagnosing adenomyosis and leiomyoma, showing significant accuracy for specific features like no distinction of the endometrial-myometrial junction, heterogeneous myometrial echotexture, and clear tumor margins, while demonstrating variable sensitivity and specificity for other features. A study conducted by Kepkep et al reported that, myometrial heterogeneity was the most sensitive and had the highest NPV, while subendometrial echogenic linear striations, despite being the least prevalent, were the most specific with the highest PPV. Regular uterine enlargement, myometrial cysts, and subendometrial striations showed high accuracy.[18]

Limitations

This study had several limitations. The relatively small sample size may have limited the generalizability of the findings to the wider population. In addition, participants were recruited only from women who underwent hysterectomy, myomectomy, or adenomyomectomy, which may have introduced selection bias and may not represent all patients with adenomyosis, leiomyoma, or both. Furthermore, the study relied primarily on transvaginal ultrasonography and histopathological correlation, without incorporating other imaging modalities such as MRI, which might have provided additional diagnostic information and improved the overall assessment.

CONCLUSION

The study found that TVS effectively identified key features of adenomyosis and leiomyoma. TVS findings for adenomyosis and leiomyoma showed a significant correlation with histopathological confirmation. Most of TVS-positive cases of adenomyosis and leiomyoma were confirmed histologically, and TVS-negative cases were also confirmed negative by histopathology, demonstrating high diagnostic validity for both conditions. In regards of adenomyosis, high sensitivity and specificity were noted for features like heterogeneous myometrial echotexture and asymmetry of anterior posterior myometrium. Myometrial cysts and fibrosis had moderate sensitivity but very high specificity. For leiomyoma, TVS showed high sensitivity for clear tumor margins. The presence of blood vessels and irregular uterine surfaces also demonstrated significant associations with leiomyoma, highlighting TVS's reliability in distinguishing these features.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Bulun SE, Yildiz S, Adli M, Wei JJ. Adenomyosis pathogenesis: Insights from next-generation sequencing. Hum Reprod. 2021;27:1086-97.
2. Benagiano G, Brosens I. History of adenomyosis. Best Pract Res Clin Obstet Gynaecol. 2006;20:449-63.
3. Benagiano G, Habiba M, Brosens I. The pathophysiology of uterine adenomyosis: An update. Fertil Steril. 2012;98:572-9.
4. Woźniak A, Woźniak S. Ultrasonography of uterine leiomyomas. Med Res J. 2017;16:113-7.
5. Rashid SQ, Chou YH, Tiu CM. Ultrasonography of uterine leiomyomas. J Med Ultrasound. 2016;24:3-12.
6. Hanafi M. Ultrasound diagnosis of adenomyosis, leiomyoma, or combined with histopathological correlation. J Hum Reprod Sci. 2013;6:189-93.
7. Lethaby A, Vollenhoven B. Fibroids (uterine myomatosis, leiomyomas). BMJ Clin Evid. 2015;2015:0814.
8. Dueholm M, Lundorf E, Hansen ES, Sørensen JS, Ledertoug S, Olesen F. Magnetic resonance imaging and transvaginal ultrasonography for the diagnosis of adenomyosis. Fertil Steril. 2001;76:588-94.

9. Lin P, Sun YL, Wang CB, Lee CY, Wun TH, Lin YH, et al. Transvaginal sonographic criteria for the diagnosis of adenomyosis based on histopathologic correlation. Taiwan J Obstet Gynecol. 2010;49:40-4.
10. Antero MF, Ayhan A, Segars J, Shih IM. Pathology and pathogenesis of adenomyosis. Semin Reprod Med. 2020;38:108-18.
11. Stewart EA. Uterine fibroids. Lancet. 2001;357:293-8.
12. Stewart EA, Laughlin-Tommaso SK, Catherino WH, Lalitkumar S, Gupta D, Vollenhoven B. Uterine fibroids. Nat Rev Dis Primers. 2016;2:16043.
13. Price Z. The effects of race, ethnicity, education, marital status, and family size on hysterectomy rates [thesis]. Hampton (VA): Hampton University; 2021.
14. Gopinath L, Vaidya R. Prevalence of adenomyosis and associated gynaecological pathologies in hysterectomy samples: A retrospective study. Int J Res Med Sci. 2021;9:2606.
15. Nnoaham KE, Webster P, Kumbang J, Kennedy SH, Zondervan KT. Is early age at menarche a risk factor for endometriosis. A systematic review and meta-analysis of case-control studies. Fertil Steril. 2012;98:702-12.
16. Vannuccini S, Petraglia F. Recent advances in understanding and managing adenomyosis. F1000Res. 2019;8.
17. Bazot M, Cortez A, Darai E, Rouger J, Chopier J, Antoine JM, et al. Ultrasonography compared with magnetic resonance imaging for the diagnosis of adenomyosis: Correlation with histopathology. Hum Reprod. 2001;16:2427-33.
18. Kepkep K, Tuncay Y, Göynümer G, Tutal E. Transvaginal sonography in the diagnosis of adenomyosis: Which findings are most accurate? Ultrasound Obstet Gynecol. 2007;30:341-5.

Cite this article as: Akter K, Khatun M, Urmi RH, Kauser US, Alam S. Role of transvaginal ultrasound in diagnosis of adenomyosis, leiomyoma, or both in comparison with histopathological findings. Int J Reprod Contracept Obstet Gynecol 2026;15:3811-7.