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A Comparative Study Of Ultrasonography And Magnetic Resonance Imaging In Detection And Analysis Of Ovarian Lesions

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ABSTRACT

Background: Ovarian lesions present an extensive spectrum of pathology, from benign cysts to malignant neoplasms, often posing diagnostic challenges, especially in resource-constrained settings. In India, ovarian cancer remains a major cause of gynecological morbidity and mortality, largely due to delayed diagnosis and limited access to advanced imaging modalities.

Objective: This study aimed to compare the diagnostic accuracy of ultrasonography (USG) and magnetic resonance imaging (MRI) in detecting and characterizing ovarian lesions to determine their relative efficacy in differentiating benign from malignant pathology.

Methodology: A prospective observational study was conducted over 18 months (May 2023–November 2024) at Lucknow. Forty-five female patients aged 17–60 years with clinically suspected ovarian lesions underwent USG and MRI. Imaging findings were evaluated independently by blinded radiologists, and diagnoses were confirmed by histopathology or intraoperative findings. Lesions were assessed based on morphological features, vascularity, and associated findings. Sensitivity, specificity, PPV, and NPV were calculated, and comparative diagnostic accuracy between USG and MRI was statistically analyzed.

Results: Among the 45 cases, 36 (80%) were benign and 9 (20%) malignant. MRI demonstrated higher sensitivity and specificity in detecting malignant features such as solid components, papillary projections, ascites, and omental deposits, especially in complex and cystic lesions. While USG was effective in evaluating simple cysts and hemorrhagic lesions, it showed limitations in accurately classifying borderline and malignant lesions. Statistically significant differences were observed in diagnostic performance, favoring MRI over USG ($p < 0.05$).

Conclusion: MRI demonstrated superior diagnostic accuracy over ultrasonography in evaluating ovarian lesions, particularly in distinguishing benign from malignant masses. Its enhanced sensitivity in detecting malignant features and better concordance with histopathology highlight its critical role in accurate, non-invasive preoperative assessment and management planning.

Keywords: *Ovarian Lesions, Magnetic Resonance Imaging (MRI), Ultrasonography (USG), Hemorrhagic Lesions, Cysts.*

1. INTRODUCTION

Ovarian lesions constitute a varied group of gynecological pathologies, from benign cystic formations to aggressive malignant neoplasms, and continue to pose significant diagnostic and therapeutic challenges in clinical practice. [1] In the Indian setting, the burden of ovarian disease, especially epithelial ovarian carcinoma, has been rising, with ovarian malignancies accounting for a considerable proportion of all female genital tract cancers. Ovarian cancer accounted for the fifth leading cause of cancer-related mortality among women in India due to the aggressive biological nature of the disease and delays in diagnosis. [2]

Globally, ovarian cancer continues to be a major public health concern. According to the Global Cancer Observatory (GLOBOCAN) 2022, 324,603 women were newly diagnosed with ovarian cancer. By 2050, this figure will rise by 55%, reaching approximately 503,448 new cases annually. [3] This rising statistic occurs due to aging populations, increasing life expectancy, and persistent limitations in early detection, especially in low- and middle-income countries. The non-specific symptomatology of ovarian lesions, which often remain clinically silent until advanced stages, coupled with restricted access to advanced diagnostic imaging, contributes significantly to late-stage presentation and poor prognostic outcomes.

In primary health care settings, transabdominal and transvaginal ultrasonography (USG) remain the first-line imaging modalities for evaluating suspected adnexal pathology due to their prevalent availability, non-invasiveness, real-time capability, and relative affordability. While USG is well-established in the initial assessment of ovarian morphology and vascularity, its diagnostic utility is limited in cases of complex, atypical, or borderline lesions. Interpretation is also subject to inter-operator variability. [4, 5] To overcome these limitations, magnetic resonance imaging (MRI) has emerged as a valuable alternative tool in the diagnosis of indeterminate adnexal masses. MRI offers superior soft-tissue contrast, multiplanar capability, and greater accuracy in characterizing tissue composition, thus enabling more definitive lesion characterization. However, it has some limitations, such as high cost, limited accessibility in peripheral and rural health settings, and lack of availability as a point-of-care modality, that restrict its routine use in primary evaluation. [4.5]

In a recent study by **Neeharika C et al. (2021),** comparative findings between USG and MRI underscored these diagnostic discrepancies. [6] Two cases of serous cystadenocarcinoma were misclassified as benign on USG but correctly identified as malignant on MRI. Similarly, a mucinous cystadenocarcinoma was falsely labeled benign on sonography but accurately detected by MRI. However, the study also reported a case misinterpreted by both imaging modalities as a tubo-ovarian abscess due to an adjacent psoas abscess, which was later confirmed to be ovarian carcinoma on histopathology, highlighting the occasional diagnostic limitations of both modalities.

On the other hand, some emerging evidence supports a tailored approach to imaging in ovarian lesions. Ultrasonography is typically sufficient for the evaluation of simple cysts, hemorrhagic cysts, and endometriomas. [7] On the other hand, MRI demonstrates superior diagnostic performance in delineating complex or solid-cystic masses, detecting peritoneal metastases, and aiding in preoperative staging of ovarian malignancies, mostly when initial sonographic findings are equivocal or suspicious for malignancy. [8]

In this background, the purpose of this study was to evaluate and compare the diagnostic performance of ultrasonography and magnetic resonance imaging in the detection and characterization of ovarian lesions.

2. METHODOLOGY

The present study was conducted in the Department of Radiodiagnosis at Integral Institute of Medical Science & Research (IIMS&R), Lucknow, over a period of 18 months, from May 2023 to November 2024. A total of 45 female patients, aged between 17 and 60 years, who presented with clinical or laboratory suspicion of ovarian lesions and were referred for ultrasonography (USG) or magnetic resonance imaging (MRI), were enrolled in this prospective observational study.

Sample size:

The sample size was initially estimated using standard formulas based on previously reported sensitivity values of USG and MRI for detecting adnexal masses. For MRI, with an assumed sensitivity of 91% and a 10% allowable error, the calculated sample size was approximately 40. After adjusting for a 10% non-response rate, the sample size increased to 44. Similarly, for USG, with a sensitivity of 90%, the calculated and adjusted sample size was also 48. However, based on practical feasibility and the availability of eligible participants during the study period, a total of 45 cases were evaluated, comprising 36 patients with benign ovarian lesions and 9 with malignant lesions.

Female patients aged between 17 and 60 years, either of reproductive age or postmenopausal, who had clinically suspected or incidentally detected adnexal lesions on ultrasound, were included. Patients were excluded if they had contraindications to MRI (e.g., cardiac pacemakers, prosthetic heart valves, MR-incompatible implants, or claustrophobia), clinically confirmed ectopic pregnancies requiring emergency intervention, were under 17 years of age, or did not provide informed consent.

All participants provided written informed consent prior to enrollment. Ethical approval was obtained from the Institutional

Ethics Committee, and strict confidentiality of patient data was maintained throughout the study.

Detailed clinical data, including demographic characteristics and presenting symptoms, were recorded. Ultrasonography was performed using a Samsung HS 50 system with transabdominal (2–5 MHz curvilinear probe) and transvaginal (5–7.5 MHz) approaches, based on the clinical context. Scanning included sagittal, transverse, and oblique planes to optimize visualization of ovarian morphology. Doppler imaging was utilized to assess vascularity within the lesions.

Pelvic MRI examinations were performed on a Philips Intera Achieva 1.5 Tesla scanner. Imaging protocols included T1-weighted spin echo (SE) or fast spin echo (FSE) in axial and sagittal planes, T2-weighted FSE in axial, coronal, and sagittal planes, T2-weighted fat-suppressed sequences in axial and coronal planes, and diffusion-weighted imaging (DWI) with apparent diffusion coefficient (ADC) mapping. Post-contrast T1-weighted imaging was performed in all planes when indicated. Gadolinium-based contrast agents were administered after verifying renal function through serum creatinine levels.

Each USG and MRI examination was interpreted independently by radiologists blinded to the findings of the other modality and to the final diagnosis. Final diagnoses were confirmed by intraoperative findings or histopathological correlation, wherever available.

Radiological parameters assessed on both modalities included lesion size, shape, internal architecture, wall thickness, septations, presence of fat or hemorrhagic content, vascularity (on USG Doppler or MRI contrast enhancement), and associated features such as solid components, papillary projections, ascites, omental deposits, and lymphadenopathy.

Statistical analysis:

Statistical analysis was conducted using IBM SPSS software version 21.0. Descriptive statistics were used to summarize demographic and clinical characteristics. The diagnostic performance of USG and MRI was evaluated by calculating sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV). A comparative analysis between USG and MRI was performed to assess their relative accuracy in distinguishing benign from malignant ovarian lesions. Chi square test were used to calculate the categorical data. A p-value of <0.05 was considered statistically significant.

3. RESULTS

In the present investigation, a total of 45 cases were examined, of which 36 were identified as benign lesions and 9 as malignant. The mean age of the participants was 35.61 ± 10.49 years, as presented in Table 1.

Table 1: Participants distribution across different age groups

Age Group	Benign Lesions (n=36)	Malignant Lesions (n=9)	p-value
10–19	2 (5.56%)	0 (0%)	
20–29	11 (30.56%)	1 (11.11%)	
30–39	13 (36.11%)	1 (11.11%)	
40–49	9 (25.00%)	5 (55.56%)	
50–59	1 (2.78%)	1 (11.11%)	
60–69	0 (0%)	1 (11.11%)	
Mean Age (years)	**35.61 ± 10.49**		<0.001

Table 2: Comparison of Radiological Features in Benign and Malignant Lesions.

Parameter	Category	Benign Lesions (n=36)	Malignant Lesions (n=9)	p-value
Size of Lesion (USG)	< 5 cm	5 (13.89%)	1 (11.11%)	<0.001
	5–10 cm	26 (72.22%)	1 (11.11%)	
	>10 cm	5 (13.89%)	7 (77.78%)	
Consistency (USG)	Cystic	21 (58.33%)	5 (55.56%)	0.032

	Solid-Cystic	9 (25.00%)	3 (33.33%)	
	Solid	6 (16.67%)	1 (11.11%)	
Echogenicity (USG)	Anechoic	17 (47.22%)	6 (66.67%)	0.012
	Hypoechoic	2 (5.56%)	1 (11.11%)	
	Hyperechoic	8 (22.22%)	2 (22.22%)	
	Heterogeneous	9 (25.00%)	0 (0.00%)	
Signal Intensity (MRI)	High Signal	20 (55.56%)	5 (55.56%)	0.012
	Altered Signal	10 (27.78%)	4 (44.44%)	
	Low Signal	6 (16.67%)	0 (0.00%)	

In this study, malignant lesions were significantly larger in size compared to benign ones, with 77.78% of malignant cases measuring >10 cm ($p < 0.001$). Solid-cystic and solid consistencies were more common in malignant lesions, while cystic patterns predominated in both groups ($p = 0.032$), rest of the findings reported in Table 2.

Table 3: Imaging Features in Benign and Malignant Lesions (n=36 and n=9).

Feature	**Modality**	**Benign Lesions (n=36)**	**Malignant Lesions (n=9)**	**p-value**
Septations	USG	15 (41.7%)	7 (77.8%)	<0.001
	MRI	17 (47.2%)	8 (88.9%)	
Septal Thickness	USG <3mm	15 (41.67%)	0 (0%)	<0.001
	USG >3mm	2 (5.56%)	7 (77.78%)	
	MRI <3mm	16 (44.44%)	0 (0%)	
	MRI >3mm	1 (2.78%)	7 (77.78%)	
Mural Nodule / Papillary Projection	USG	0 (0%)	7 (77.78%)	<0.001
	MRI	0 (0%)	8 (88.89%)	
Enhancement Pattern (MRI)	Homogenous	2 (5.56%)	0 (0%)	<0.001
	Capsular	6 (16.67%)	1 (11.11%)	
	Solid Component	1 (2.78%)	1 (11.11%)	
	Septal	0 (0%)	7 (77.78%)	
	None	27 (75%)	0 (0%)	
Other Features	USG Vascularity	1 (2.78%)	6 (66.7%)	<0.001
	USG Lymphadenopathy	0 (0%)	5 (55.56%)	
	USG Ascites	3 (8.33%)	5 (55.56%)	
	MRI Lymphadenopathy	1 (2.78%)	6 (66.67%)	
	MRI Omental Involvement	0 (0%)	3 (8.33%)	
	MRI Ascites	5 (13.89%)	5 (55.6%)	

In the current study, imaging findings showed that septations were more frequent in malignant lesions, with thicker septa (>3 mm) notably associated with malignancy on both USG and MRI ($p<0.001$). Mural nodules or papillary projections were absent in benign cases but seen in a majority of malignant lesions, as represented in Table 3.

Table 4: Diagnosis distribution for benign and malignant lesions on USG

Diagnosis	Benign lesions(n=36)		Malignant lesions(n=9)	
	No.	%	No.	%
Simple Ovarian Cyst	10	27.77	0	00
Serous Cystadenoma	5	13.89	0	00
Mucinous Cystadenoma	3	8.33	0	00
Endometriosis	5	13.89	0	00
Hemorrhagic Cyst	6	16.67	0	00
Dermoid Cyst	3	8.33	0	00
Tubo-Ovarian Abscess	2	5.56	0	00
Solid Benign Tumor	1	2.78	0	00
Ovarian Torsion	1	2.78	0	00
Serous Cystadenocarcinoma	0	00	3	33.33
Mucinous Cystadenocarcinoma	0	00	3	33.33
Solid Malignant ovarian Lesion	0	00	2	22.22
Solid Tubo-ovarian Mass	0	00	1	11.11

Among the 45 study subjects, classification based on MRI findings revealed that among benign lesions (n=36), the most common diagnosis was simple ovarian cyst (24.9%), followed by hemorrhagic cyst (16.67%). In malignant cases (n=9), serous cystadenocarcinoma was the most frequently observed lesion, seen in 55.56% of cases, as summarised in Table 4.

Table 5: Diagnosis distribution for benign and malignant lesions on MRI

Diagnosis	Benign lesions(n=36)		Malignant lesions(n=9)	
	No.	%	No.	%
Simple Ovarian Cyst	9	24.9	0	00
Serous Cystadenoma	3	8.34	0	00
Mucinous Cystadenoma	2	5.56	0	00
Endometriosis	5	13.89	0	00
Hemorrhagic Cyst	6	16.67	0	00
Dermoid Cyst	4	11.11	0	00
Tubo-Ovarian Abscess	2	5.56	0	00
Fibroid	3	8.34	0	00

Solid Benign Tumor	1	2.78	0	00
Ovarian Torsion	1	2.78	0	00
Serous Cystadenocarcinoma	0	00	5	55.56
Mucinous Cystadenocarcinoma	0	00	4	44.44

In the present study comprising 36 benign and 9 malignant adnexal lesions, the benign cases included a variety of diagnoses. The most common benign lesion was a simple ovarian cyst, observed in 9 cases (24.9%), followed by hemorrhagic cysts in 6 cases (16.67%) and endometriosis in 5 cases (13.89%), some other findings are presented in Table 5.

Table 6: Diagnosis distribution for benign and malignant lesions on HPE

Diagnosis	**Benign lesions(n=36)**		**Malignant lesions(n=9)**	
	No.	%	No.	%
Simple Ovarian Cyst	9	25.7	0	00
Serous Cystadenoma	3	8.5	0	00
Mucinous Cystadenoma	2	5.7	0	00
Endometriosis	5	14.2	0	00
Hemorrhagic Cyst	6	17.1	0	00
Dermoid Cyst	4	11.4	0	00
Tubo-Ovarian Abscess	2	5.7	0	00
Fibroid	3	8.5	0	00
Ovarian Torsion	1	2.8	0	00
Serous Cystadenocarcinoma	0	00	5	50
Mucinous Cystadenocarcinoma	0	00	4	33.3
Dysgerminoma	0	00	1	16.7

In this study, among the 36 benign adnexal lesions, the most common diagnosis was a simple ovarian cyst, seen in 9 cases (25.7%), followed by hemorrhagic cysts in 6 cases (17.1%) and endometriosis in 5 cases (14.2%), as shown Table 6.

Table 7: Comparing sensitivity and specificity of USG and MRI with HPE

USG diagnosis	**HPE diagnosis (n=45)**		**No. of cases**	**p-value**
	Benign	Malignant		
BENIGN	33	03	36	<0.001
MALIGNANT	03	06	09	
TOTAL	35	9	45	

MRI diagnosis	HPE diagnosis (n=45)		No. of cases	p-value
	Benign	Malignant		
BENIGN	34	02	36	<0.001
MALIGNANT	02	07	09	
TOTAL	36	9	45	

In the comparison of imaging diagnosis with histopathological examination (HPE) in 45 patients, ultrasound (USG) identified 36 cases as benign and 9 as malignant. Among the USG-diagnosed benign cases, 33 were confirmed benign and 3 were malignant on HPE. Of the 9 cases diagnosed as malignant by USG, 6 were confirmed malignant and 3 were actually benign, with a statistically significant p-value (<0.001), indicating strong correlation. Similarly, MRI diagnosed 36 cases as benign and 9 as malignant. Out of the benign MRI diagnoses, 34 were confirmed benign and 2 were malignant, as mentioned in Table 7.

Table 8: Overall Sensitivity, Specificity, PPV, NPV and Accuracy of USG and MRI with respect to final diagnosis

Parameter	**USG**	**MRI**
Sensitivity	77.78%	80.00%
Specificity	91.67%	97.14%
Accuracy	88.89%	93.33%
Positive Predictive Value	70.00%	88.89%
Negative Predictive Value	94.19%	94.84%

According to Table 8, diagnostic accuracy was higher for MRI (93.33%) than USG (88.89%). Additionally, MRI had a higher positive predictive value (88.89%) than USG (70.00%), while both modalities showed comparable negative predictive values (MRI: 94.84%, USG: 94.19%).

4. DISCUSSION

In the present prospective study involving 45 patients with ovarian lesions, 80% (n=36) were benign and 20% (n=9) malignant, as confirmed on histopathology. The mean age for benign lesions was 35.61 ± 10.49 years. These results similar with the epidemiological pattern observed in other Indian studies where malignancies tend to present in perimenopausal women. [9, 10]

Lesion size emerged as a significant discriminator between benign and malignant pathology. Most benign lesions (72.22%) measured 5–10 cm, whereas 77.78% of malignant lesions were >10 cm, with statistical significance (p<0.001). This association reiterates the findings by **Tanusri D et al. [5]** and **Narikelapu N et al. [6],** who emphasized lesion size >10 cm as a reliable indicator of malignancy risk. The strong correlation in our study underscores the relevance of lesion size as a primary screening parameter on imaging.

Ultrasonographic features were distinct across benign and malignant groups. Benign lesions most commonly demonstrated cystic (58.33%) and anechoic (47.22%) appearances, while malignant lesions, though also frequently anechoic (66.67%), showed higher proportions of solid-cystic components (33.33%) and papillary projections (77.78%). The presence of heterogeneous echogenicity was exclusive to benign lesions (25%), whereas its absence in malignant lesions may suggest a pattern favoring benign diagnoses. Internal architecture assessment revealed statistically significant differences in echogenicity and consistency (p=0.032 and p=0.012, respectively), presenting these as important sonographic predictors.

The presence and characteristics of septations further improve diagnostic differentiation. Septations were seen more frequently in malignant lesions both on USG (77.8%) and MRI (88.9%), as compared to benign ones (41.7% and 47.2%, respectively). Notably, thick septations (>3 mm) were observed in 77.78% of malignant lesions on both modalities, with

none of the benign lesions showing such thickness. These findings, consistent with studies by **Chinta Vittal Prasad et al., [11]** and **Rizwan Karim Khan et al.,** [12]**,** highlight septal thickness as a key marker of malignancy.

Mural nodules and papillary projections were absent in all benign lesions but present in the vast majority of malignant lesions on both USG (77.78%) and MRI (88.89%), with $p<0.001$. Similarly, vascularity, lymphadenopathy, and ascites were significantly more prevalent in malignant lesions, suggesting that the presence of ancillary findings such as increased vascular flow, regional nodal involvement, and peritoneal fluid are valuable adjuncts in radiologic suspicion of malignancy.

In terms of improvement patterns on MRI, benign lesions most often showed no enhancement (75%), whereas malignant lesions predominantly demonstrated septal (77.78%) and solid component improvement (11.11%). These findings show the increased vascularity and structural complexity seen in malignancies.

Diagnostic correlation with histopathology demonstrated that the most common benign lesions on USG and MRI were simple ovarian cysts, hemorrhagic cysts, and dermoid cysts. In contrast, malignant lesions included serous and mucinous cystadenocarcinomas. USG misclassified a few malignant lesions as benign due to subtle features being missed, including papillary projections and septations, which MRI was able to identify, as seen in mucinous cystadenocarcinoma and serous cystadenocarcinoma cases. Additionally, uterine fibroids and pedunculated masses were misinterpreted as ovarian in origin on USG but correctly identified on MRI, supporting the superior anatomical resolution of MRI.

One notable case of dysgerminoma was missed on both modalities due to its small size and nonspecific features but was confirmed on histopathology. This illustrates that imaging, while crucial, may still have limitations in subtle or early presentations, emphasizing the role of histopathology as the diagnostic gold standard.

When diagnostic performance was analyzed against histopathology, MRI outperformed USG. MRI demonstrated a sensitivity of 80%, specificity of 97.14%, PPV of 88.89%, NPV of 94.84%, and overall diagnostic accuracy of 93.33%. USG, while still effective, showed slightly lower values: sensitivity of 77.78%, specificity of 91.67%, PPV of 70%, NPV of 94.19%, and accuracy of 88.89%. These findings are consistent with previous literature evidence. **Aruna et al., [13] and Sohaib et al., [14]** reported higher sensitivity and specificity for MRI compared to USG, particularly in complex lesions and those with overlapping benign-malignant features.

5. CONCLUSION

Based on the findings of the present study, MRI demonstrated superior diagnostic utility as compared to USG in the evaluation of ovarian lesions. MRI revealed higher sensitivity, specificity, and overall diagnostic accuracy, especially in distinguishing between benign and malignant masses. It was more effective in detecting key malignant features such as thick septations, mural nodules, septal enhancement, lymphadenopathy, ascites, and omental involvement, which were often missed or less clearly defined on USG. Furthermore, MRI showed better concordance with histopathological diagnoses, reinforcing its value as a more reliable modality for the preoperative characterization of ovarian lesions. Our findings shed light on how MRIs help to improve diagnostic precision and their critical role in improving the non-invasive assessment and management planning of ovarian pathologies.

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REFERENCES

[1] Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 2021;71(3):209–49.

[2] Chawla AA, Jadhav PN, Sahu S, Savale AS. Histopathological insights into ovarian tumors: A case series perspective. *Indian J Obstet Gynecol Res*. 2024;11(3):496–503.

[3] International Agency for Research on Cancer. Cancer Tomorrow [Internet]. [cited 2024 May 13]. Available from: https://gco.iarc.fr/tomorrow/en/dataviz/tables?cancers=25&single_%20unit=10000&years=2050

[4] Siddhartha N, Nimbal V, Lamani PU, Halkude T, Kolekar P. A comparison study of magnetic resonance imaging and ultrasonography in the evaluation of ovarian lesions with an emphasis on ovarian adnexal reporting and data system. *Cureus*. 2025;17(5):e83858.

[5] Debbarma T, Ray J, De A, Ray MS. A study on validity of ultrasonography and magnetic resonance imaging in assessment of uterine adnexal masses. *Int J Anat Radiol Surg*. 2021;10(2):RO29–35.

[6] Neeharika C, Ravindran C. Ultrasound and magnetic resonance imaging correlation of adnexal lesions. *J Res Med Dent Sci*. 2021;9(5):282–9.

[7] Ștefan RA, Ștefan PA, Mihu CM, et al. Ultrasonography in the differentiation of endometriomas from hemorrhagic ovarian cysts: the role of texture analysis. *J Pers Med*. 2021;11(6):611.

[8] Thomassin-Naggara I, Aubert E, Rockall A, Jalaguier-Coudray A, Rouzier R, Daraï E, et al. Adnexal masses: development and preliminary validation of an MR imaging scoring system. *Radiology*. 2013;267(2):432–43.

[9] Sultana N, Nasrullah F, Hameedi S. Adnexal masses: To compare the diagnostic accuracy of transabdominal ultrasonography and contrast enhanced magnetic resonance imaging in the characterisation of adnexal masses. *Prof Med J*. 2019;26(2):202–7.

[10] Varwatte P, Gurubharath I, Harshavardhan B, Pavithra A. Comparative study of ultrasonography and magnetic resonance imaging in the diagnosis of adnexal lesions. *Int J Contemp Med Surg Radiol*. 2020;5(2):B38–43.

[11] Prasad CV, Veeraswamy S, Muppavarapu VM. Efficacy of MRI and USG in the evaluation of adnexal mass lesions and correlation with histopathological examination. *Int J Radiol Diagn Imaging*. 2020;3(1):27–30.

[12] Khan RK, Tiwari V, Vij V. Imaging evaluation of ovarian masses on sonography and MRI with histopathological correlation. *J Evol Med Dent Sci*. 2022;20(10):1015–42.

[13] Kumari BA, Chandra AS. Diagnosis of adnexal masses – using ultrasound and magnetic resonance imaging for proper management. *Asian Pac J Health Sci* [Internet]. 2016 Dec 30 [cited 2025 Mar 24];3(4):279–84.

[14] Sohaib SA, Mills TD, Sahdev A, Webb JA, Vantrappen PO, Jacobs IJ, et al. The role of magnetic resonance imaging and ultrasound in patients with adnexal masses. *Clin Radiol*. 2005;60(3):340–8.