

DIAGNOSTIC PERFORMANCE ORADS –US IN DISCRIMINATING BENIGN FROM MALIGNANT ADNEXAL LESION: A PROSPECTIVE STUDY IN TERTIARY CENTRE OF SOUTH INDIA

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Received : 19/11/2022
Received in revised form : 19/12/2022
Accepted : 02/01/2023

Keywords:
Clavicle, TENS, Plating

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DOI: 10.47009/jamp.2023.5.1.180

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5 (1); 871-873



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Abstract

Background: Early diagnosis and management of ovarian malignancy is important, ultrasound considered first and effective diagnostic tool in evaluating adnexal lesion ,several risk stratification systems like IOTA, GIRADS adnex and the recently released ovarian adnexal Imaging Reporting and Data System (ORADS us) recommended, recent studies suggest ORADS US, high sensitivity and specificity and appears less complex compared to other risk stratification system, There is only few research available based on tissue diagnosis especially from Asia. The purpose of our study was to evaluate the performance of US –ORADS in Discriminating benign and malignant ovarian lesion based on histopathological data bases. **Materials and Methods:** This was a single-centres prospective study. From August 2021 to September 2022, we evaluated 73 adnexal masses and categorized in to ORADS and HPE data. **Result:** O-RADS sensitivity for detection of ovarian cancer was 70%, with a specificity of 84.9%, negative predictive value of 88.24 %, and positive predictive value of 63.64%, with an accuracy of 80.82%. **Conclusion:** ORADS US provides effective in risk stratification of ovarian lesion and the diagnostic performance is high, the application of the guidelines in the clinical practice might help for managing adnexal lesion.

INTRODUCTION

Every radiologist encounters different kinds of adnexal lesions in their day-to-day practices and about 10 % of the adnexal lesions turns out to be malignant. Of all the cancer related deaths among women, ovarian malignancy ranks the fifth most common cause,^[1] as most of the lesions remain asymptomatic till late stages and some patients approaches health facility only in late stages. The management of adnexal lesions varies based on the clinical picture and the imaging appearances, that's why accurately characterizing adnexal lesions on imaging is very important. It helps to avoid inappropriate surgery in benign lesions and thereby avoiding un-necessary complications and also reducing the financial burden on the patient. It also helps to guide the suspected malignant cases to a gynecological oncologist in time, so that early treatment can be initiated.^[2-4] A consensus report by a multidisciplinary panel of experts published in 2017, regarding management of adnexal masses,^[5]

also concluded that surgical procedures for benign lesions may be avoided with improvement in the preoperative assessment of these lesions. So, morphological characterization of the adnexal lesion needs to be done in a systematic structured way. As of now, there are various adnexal lesion characterization systems are available, of which IOTA (International Ovarian Tumor Analysis) system - 2020 is the most widely accepted one.^[6] Various other systems like IOTA ADNEX (Assessment of Different Neoplasia in Adnexa,^[7-9] University of Kentucky morphology index,^[10-12] GI-RADS,^[13] (Gynecologic Imaging Reporting and Data System) and Society of Radiologists Ultrasound (SRU),^[14] consensus statement- 2010. The major draw backs of the above-mentioned systems are that they do not include standardized terminology and definitions or they do not recommend management for higher-risk lesions or they do not provide objective criteria for all lesions, or lacks a widespread acceptance. So considering all these, Ovarian-Adnexal Reporting and Data Systems (O-RADS) Committee was formed under

the American College of Radiology (ACR), and this international multidisciplinary group of experts developed the O-RADS ultrasound (US) Risk Stratification and Management System in 2018,^[15] primarily based on the guidelines from IOTA, which provides a standardized lexicon that includes all standard descriptors and definitions of the characteristic US appearance of normal ovaries and ovarian or other adnexal lesions.

The proposed guidelines include all risk categories with their attendant management strategies and is a multidisciplinary, collaborative, international approach incorporating both the common European and North American approaches.

MATERIALS AND METHODS

This prospective study was conducted in the Department of Radio diagnosis in collaboration with Department of gynaecology, The patients were recruited according to the inclusion and exclusion criteria

Subjects

- From August 2020 to September 2022, adult female patients with inclusion and exclusion criteria 1 underwent US examination and biopsy.

Inclusion Criteria

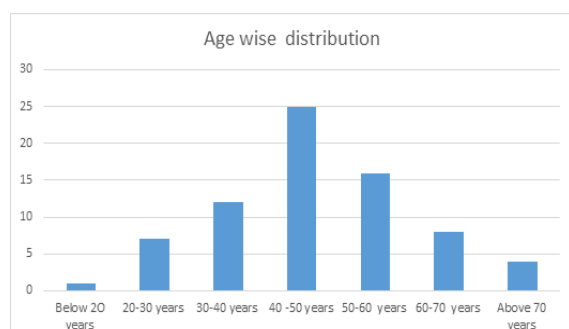
- All patients above 18 years with adnexal lesion
- All cases of adnexal lesions which is categorized according to ORADS which underwent biopsy

Exclusion Criteria

- Known case of gynaecological malignancy
- Those patients whose biopsy was not done.

All Transvaginal ultrasound were performed in a standardized GE by two radiologists. All images were reviewed by radiology professor who has more than 26-year experience in ultrasound. Reports were classified, according to O-RADS, as benign findings (O-RADS 0-2) and suggestive of malignancy (O-RADS3-5). These diagnoses were compared with histopathology reports and then these reports were divided into benign or malignant findings, premalignant lesions also were included in malignant finding category

RESULTS



In our study commonest age group was between 40 – 50 years, followed by age group of 50- 60 years.

One case was below 20 years and 4 cases above 70 years.

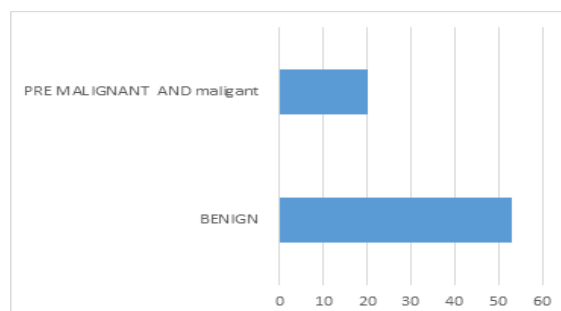
Findings in O-RADS based on USG stratification

Out of 73 patients with adnexal lesion, 51 cases were categorized in to ORADS 0-2 (orange colour) and 22 cases were ORADS 3-5 category (blue colour).



Histopathological Finding

Based on histopathological reports of these patients, patients were categorized in two, those with premalignant and malignant were categorized in to one group and those with benign findings in other group.



Based on this variable 2x2 table is created and diagnostic accuracy of test were calculated

	MALIGNANT	BENIGN	
ORADS 3,4,5	14	8	22
ORADS 1 AND 2	6	45	51
	20	53	73

Based on this with help of software diagnostic performance of the ORADS risk stratification was calculated.

Sensitivity	70.00%
Specificity	84.91%
Positive Predictive Value (*)	63.64%
Negative Predictive Value (*)	88.24%
Accuracy (*)	80.82

DISCUSSION

A total of 73 patients underwent trans-abdominal and transvaginal ultrasound over a period from September 2020 to September 2022 subsequently underwent biopsy. The commonest age group in our study population was 40 to 50 years.

USG plays a significant role in the evaluation adnexal lesion.

Surgical excision is currently the most commonly accepted method of management of adnexal lesions. However, most cystic masses are benign and can be adequately characterised and followed up with ultrasound without surgical treatment. Although the consensus of the society of Radiologists in the Ultrasound concurs, the lack of standardised terminology precludes the usage of their criteria for determining high-cystic lesions.

The sensitivity, specificity, PPV, and NPV in our study were 70, 84.91, 63.64, and 88.24 %, respectively. This appears more compared to study conducted by Dania et al. in their study sensitivity, specificity, PPV, and NPV in our study were 52%, with a specificity of 84%, negative predictive value of 79%, and positive predictive value of 60% even though sample size of the both study is same. A possible explanation of these differences could be the variable proportion of malignant lesions in the study population.^[16]

Only one case of ORADS 1 AND 2 category was diagnosed as malignant. Our results are in agreement with the orads guidelines not recommending surgery for ORADS 1 and 1 category, in our histological series there was no case of sex cord tumour. The majority of histological confirmed malignancies epithelial followed by germ cell tumour.

When comparing USG risk stratification study according to IOTA by Spanish society of medical oncology our study with Orads Stratification shows higher diagnostic performance, in their study sensitivity and specificity is 83.8 and 82.0 percentage.^[17-19]

CONCLUSION

ORADS-US system of adnexal lesions is an effective way of risk stratification of adnexal lesions with high diagnostic performance and it is less complex compared to other systems. It helps to reduce un-necessary surgical intervention for benign lesions and at the other end it also helps to plan further evaluation and management of malignant lesions.

REFERENCES

1. Cancer facts & figures 2022 (no date) American Cancer Society. Available at: <https://www.cancer.org/research/cancer-facts-statistics/all-cancer-facts-figures/cancer-facts-figures-2022.html> (Accessed: November 4, 2022).
2. Fung-Kee-Fung M, Kennedy EB, Biagi J, et al. The optimal organization of gynecologic oncology services: a systematic review. *Curr Oncol* 2015;22(4):e282–e293. Crossref, Medline, Google Scholar
3. Chan JK, Kapp DS, Shin JY, et al. Influence of the gynecologic oncologist on the survival of ovarian cancer patients. *ObstetGynecol* 2007;109(6):1342–1350. Crossref, Medline, Google Scholar
4. Woo YL, Kyrgiou M, Bryant A, Everett T, Dickinson HO. Centralisation of services for gynaecological cancers - a Cochrane systematic review. *GynecolOncol* 2012;126(2):286–290. Crossref, Medline, Google Scholar.
5. Glanc P, Benacerraf B, Bourne T, et al. First International Consensus Report on Adnexal Masses: Management Recommendations. *J Ultrasound Med* 2017;36(5):849–863. Crossref, Medline, Google Scholar.
6. Timmerman D, Valentin L, Bourne TH, et al. Terms, definitions and measurements to describe the sonographic features of adnexal tumors: a consensus opinion from the International Ovarian Tumor Analysis (IOTA) Group. *Ultrasound ObstetGynecol* 2000;16(5):500–505. Crossref, Medline, Google Scholar.
7. Timmerman D, Testa AC, Bourne T, et al. Simple ultrasound-based rules for the diagnosis of ovarian cancer. *Ultrasound ObstetGynecol* 2008;31(6):681–690. Crossref, Medline, Google Scholar
8. Timmerman D, Van Calster B, Testa A, et al. Predicting the risk of malignancy in adnexal masses based on the Simple Rules from the International Ovarian Tumor Analysis group. *Am J Obstet Gynecol* 2016;214(4):424–437. Crossref, Medline, Google Scholar
9. Van Calster B, Van Hoorde K, Valentin L, et al. Evaluating the risk of ovarian cancer before surgery using the ADNEX model to differentiate between benign, borderline, early and advanced stage invasive, and secondary metastatic tumours: prospective multicentre diagnostic study. *BMJ* 2014;349:g5920. Crossref, Medline, Google Scholar.
10. DePriest PD, Shenson D, Fried A, et al. A morphology index based on sonographic findings in ovarian cancer. *GynecolOncol* 1993;51(1):7–11. Crossref, Medline, Google Scholar
11. Ueland FR, DePriest PD, Pavlik EJ, Kryscio RJ, van Nagell JR Jr. Preoperative differentiation of malignant from benign ovarian tumors: the efficacy of morphology indexing and Doppler flow sonography. *GynecolOncol* 2003;91(1):46–50. Crossref, Medline, Google Scholar
12. Elder JW, Pavlik EJ, Long A, et al. Serial ultrasonographic evaluation of ovarian abnormalities with a morphology index. *GynecolOncol* 2014;135(1):8–12. Crossref, Medline, Google Scholar.
13. Amor F, Alcázar JL, Vaccaro H, León M, Iturra A. GI-RADS reporting system for ultrasound evaluation of adnexal masses in clinical practice: a prospective multicenter study. *Ultrasound Obstet Gynecol* 2011;38(4):450–455. Crossref, Medline, Google Scholar.
14. Levine D, Brown DL, Andreotti RF, et al. Management of asymptomatic ovarian and other adnexal cysts imaged at US: Society of Radiologists in Ultrasound Consensus Conference Statement. *Radiology* 2010;256(3):943–954. Link, Google Scholar
15. Andreotti RF, Timmerman D, Benacerraf BR, et al. Ovarian-Adnexal Reporting Lexicon for Ultrasound: A White Paper of the ACR Ovarian-Adnexal Reporting and Data System Committee. *J Am CollRadiol* 2018;15(10):1415–1429 [Published correction appears in *J Am Coll Radiol* 2019;16(3):403–406.] <https://doi.org/10.1016/j.jacr.2018.07.004>. Crossref, Medline, Google Scholar
16. Solís Cano DG, Cervantes Flores HA, De Los Santos Farrera O, Guzman Martinez NB, Soria Céspedes D. Sensitivity and Specificity of Ultrasonography Using Ovarian-Adnexal Reporting and Data System Classification Versus Pathology Findings for Ovarian Cancer. *Cureus*. 2021 Sep 1;13(9):e17646. doi: 10.7759/cureus.17646. PMID: 34650841; PMCID: PMC8489358.
17. Jha P, Gupta A, Baran TM, Maturen KE, Patel-Lippmann K, Zafar HM, Kamaya A, Antil N, Barroilhet L, Sadowski EA. Diagnostic Performance of the Ovarian-Adnexal Reporting and Data System (ORADS) Ultrasound Risk Score in Women in the United States. *JAMA Netw Open*. 2022 Jun 1;5(6):e2216370. doi: 10.1001/jamanetworkopen.2022.16370. PMID: 35679042; PMCID: PMC9185186. [Internet]. Europe PMC. [cited 2022Dec1]. Available from: <https://europepmc.org/article/MED/35679042>
18. Andreotti RF;Timmerman D;Benacerraf BR;Bennett GL;Bourne T;Brown DL;Coleman BG;Frates MC;Froyman W;Goldstein SR;Hamper UM;Horow MM;Hernanz-Schulman M;Reinhold C;Strachowski LM;Glanc P; Ovarian-Adnexal Reporting Lexicon for ultrasound: A white paper of the ACR ovarian-adnexal reporting and data system committee [Internet]. *Journal of the American College of Radiology: JACR*. U.S. National Library of Medicine; [cited 2022Dec1]. Available from: <https://pubmed.ncbi.nlm.nih.gov/30149950/>
19. Andreotti RF, Timmerman D, Strachowski LM, Froyman W, Benacerraf BR, Bennett GL, et al. O-RADS US Risk Stratification and Management System: A consensus guideline from the ACR ovarian-adnexal reporting and data system committee. *Radiology*. 2020;294(1):168–85.