ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

Original Research Article

Using HPE to evaluate the precision of ultrasonography features in the identification and description of adnexal mass lesions.

Authors: Dr. Ankur Jain[1] (Assistant Professor), Dr. Devendra Kumar Khatana[2] (Associate Professor), Dr. Anup Gupta[3] (Associate Professor), Dr. Radhey Sankhla[4] (Assistant Professor) & Dr. Mahendra Kumar Arya[5] (Associate Professor)

Dept. of Radio diagnosis, Index Medical College Hospital & Research Centre, Indore, M.P.[1,2,3,4&5]

Corresponding Author: Dr. Devendra Kumar Khatana

Received: 03-05-2024 Accepted: 16-05-2024 Published: 27-05-2024

Abstract

Background & Methods: The aim of the study is Using HPE to evaluate the precision of ultrasonography features in the identification and description of adnexal mass lesions. All patients are subjected to Transabdominal sonography using curvilinear probe in Aloka, Sonoscape, Esoate scanner In Ultrasonogram adnexal lesions were evaluated for several features including content, nodularity, wall thickness, septal thickness, ascites and vascularity of the lesion.

Results: The chi-square statistic is 5.3148. The *p*-value is .021145. The result is significant at $p < .05$. Out of a total of 50 samples (13 positive + 37 negative): 13 samples (26%) tested positive. 37 samples (74%) tested negative.

Conclusion: Treatment of adnexal mass lesion mandates stratification of risk based on imaging appearance of the mass. Inspite of development in advanced chemotherapy regimens and improved surgical approaches, ovarian carcinoma continues to be one of the leading causes of death from gynaecological malignancy.

Keywords: accuracy, ultrasonography, adnexal, lesions, HPE.

Study Design: Observational Study.

Introduction

Adnexa composed of structures that are closely related structurally and functionally to the uterus[1]. Causes of adnexal mass lesion may be benign or malignant. Benign lesions are simple functional cyst, serous cystadenoma, mucinous cystadenoma, endometriotic cyst, fibroma, thecoma, Brenner tumour tuboovarian cyst or hydrosalphinx. Malignant lesions are serous cystadenoarcinoma, mucinous cystadenocarcinoma, endometrotic carcinoma immature teratoma, dysgerminoma, krukenbergs tumor. Cause of adnexal mass lesion varies with different age group[2].

Ultrasonography (US), Computed Tomography (CT), and Magnetic Resonance Imaging (MRI) can be used to evaluate ovarian mass[3]. The first imaging modality for characterization of adnexal mass lesion is Ultrasonogram. Investigation of choice for adnexal

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

mass is MRI because it gives a better spatial and contrast resolution in delineation of anatomical structures as well as characterization of pathological lesions[4].

MRI well delineates the abnormalities in female reproductive organs disorders including myomas, ovarian mass lesions, adenomyosis, cervical lesions , endometrial malignancy etc.(5) Lifetime risk estimate is two to five times for individuals who have one first degree relative with ovarian cancer. Long-term users of hormone replacement therapy slightly increase ovarian cancer risk[5].

Up to age 60 years of age, 30% lifetime risk of ovarian cancer is conferred due to mutations in the BRCA1 gene. Up to age 70 years of age, 27% lifetime risk of ovarian cancer is conferred due to mutations in the BRCA2 gene. High-grade serous carcinomas show p53 is mutations in 50% or more cases[6].

Material and Methods

Present study was conducted at Index Medical College Hospital & Research Centre, Indore, on 50 patients for 01 Year were referred for evaluation of Ultrasonography and contrast MRI. The patients were first subjected to ultrasound then dynamic MR imaging was done for those adnexal lesions greater than 5 cm in size .The study was conducted after obtaining proper informed consent from the patient.

INCLUSION CRITERIA:

1. Simple adnexal cyst >5cm

2. Complex adnexal lesions

EXCLUSION CRITERIA:

1. Simple adnexal cyst <5cm

2. Ectopic pregnancy

3. Ovarian torsion

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

Result

Table No. 1: DESCRIPTIVE STATISTICS

Parameter	Mean	SD	Minimum	Maximum
Age	36.64	12.617	16	76
Thickness USG	2.892	2.5699	02	04
RI USG	0.6544	1.16173	0.4	0.9
Thickness MRI	3.104	0.5674	02	04

Table No. 2: CONTENT & ASCITES – USG

S. No.	Nature of lesion	No.	Percent	P Value
1	Cystic	41	82	.000731
2	Solid-cystic	09	18	
S. No.	**Nature of lesion**	**No.**	**Percent**	.000114
1	Absent	43	86	
2	Present	07	14	

The chi-square statistic is 11.4082. The *p*-value is .000731. The result is significant at $p < .05$.

The chi-square statistic is 14.8897. The *p*-value is .000114. The result is significant at $p < .05$.

Table No. 3: CONTENT & ASCITES - MRI

S. No.	Nature of lesion	No.	Percent	P Value
1	Cystic	39	78	.003538
2	Solid-cystic	11	22	
S. No.	**Nature of lesion**	**No.**	**Percent**	.0003
1	Absent	42	84	
2	Present	08	16	

The chi-square statistic is 8.5069. The *p*-value is .003538. The result is significant at $p < .05$.

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

The chi-square statistic is 13.071. The *p*-value is .0003. The result is significant at $p < .05$.

Table No. 4: HPE

S. No.	Parameter	No.	Percent	P Value
1	+ve	13	26	.021145
2	-ve	37	74	

The chi-square statistic is 5.3148. The *p*-value is .021145. The result is significant at $p < .05$.

Out of a total of **50** samples (13 positive + 37 negative):

- **13 samples (26%)** tested **positive**.
- **37 samples (74%)** tested **negative**.

Discussion

There is a wide range of variations in the adnexa of the uterus, from benign cysts to potentially malignant tumours. Timely and precise identification and understanding of these masses are crucial for effective clinical care and favourable patient results. Ultrasonography (USG) and Magnetic Resonance Imaging (MRI) are commonly used imaging techniques to evaluate adnexal masses without the need for invasive procedures[7-8]. Ultrasound (USG) is a widely used imaging technique due to its widespread availability, cost-effectiveness, and ability to provide real-time imaging. The MRI technique provides excellent soft tissue contrast and the ability to capture images from various angles, offering valuable information for analysing complex adnexal masses. This study aims to assess the correlation between histopathological examination (HPE), ultrasonographic findings, and MRI evaluations to achieve an early and conclusive diagnosis of adnexal masses[9].

In Ultrasonogram adnexal lesions were evaluated for several features including content, nodularity, wall thickness, septal thickness, ascites and vascularity of the lesion. A study group solid cystic nature of the lesion was seen in 15.6%, Septal thickness > 3mm in 7 cases, nodularity was seen in 11.6% and central / septal vascularity was seen in 26.7%.

Sohaib et al. [10] showed that from the analysis of the MR imaging features, “the most predictive characteristics of malignancy are vegetations/nodule in a cystic lesion, presence of ascites, a maximal diameter greater than 6 cm, and necrosis in a solid lesion” ,in the same way our study also shows the presence of nodules in a cystic lesion,

Valentini et al.[11] suggested criteria for characterization of suspicious adnexal lesions.Features suggestive of malignancy as per the valentine et al study were “solid, solid/cystic enhancing masses (greater than 4 cm in maximum diameter) with papillary projections and irregular thick wall and septa greater than 3 mm) into a cystic lesion” as well as a “heterogeneous and early enhancement pattern”. Similar to this study, the above features in our study population also had positivity for malignancy in HPE.

Adumusili et al study [12] showed Sonographically indeterminate ovarian mass lesions evaluated with MRI had a sensitivity and specificity of 100% and 94%, respectively. Result of our study MRI had a sensitivity of 91.7% and specificity of 100%.

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

Conclusion

Treatment of adnexal mass lesion mandates stratification of risk based on imaging appearance of the mass. Inspite of development in advanced chemotherapy regimens and improved surgical approaches, ovarian carcinoma continues to be one of the leading cause of death from gynaecological malignancy.

References

1. Hricak H, Chen M, Coakley FV, Kinkel K, Yu K, Sica G, et al. Complex adnexal masses: detection and characterization with MR imaging _ multivariate analysis. Radiology 2000; 214: 39_46.

2. Valentini AL, Gui B, Miccò M, Mingote MC, De Gaetano AM, Ninivaggi V, et al. Benign and suspicious ovarian masses-MR imaging criteria for characterization: pictorial review. J Oncol.2012;2012:481806

3. Adusumilli S, Hussain HK, Caoili EM, Weadock WJ, Murray JP, Johnson TD, Chen Q, Desjardins B. MRI of sonographicallyindeterminate adnexal masses. AJR Am J Roentgenol. 2006;187:732–740

4. Shaaban AM, Rezvani M, Elsayes KM, Baskin H, Jr, Mourad A, Foster BR, et al. Ovarian malignant germ cell tumors: cellular classification and clinical and imaging features. Radiographics. 2014;34(3):777–801.

5. Imaoka I, Wada A, Kaji Y, Hayashi T, Hayashi M, Matsuo M, et al. Developing an MR imaging strategy for diagnosis of ovarian masses. Radiographics. 2006;26(5):1431–48. doi: 10.1148 /rg .265045206.

6. Iyer VR, Lee SI. MRI, CT, and PET/CT for ovarian cancer detection and adnexal lesion characterization.AJR Am J Roentgenol. 2010;194(2):311 21

7. Cai SQ, Zhao SH, Qiang JW, Zhang GF, Wang XZ, Wang L. Ovarian Sertoli-Leydig cell tumors: MRI findings and pathological correlation. J Ovarian Res. 2013;26;6(1):73. doi: 10.1186/1757-2215-6-73.

8. Kim MY, Rha SE, Oh SN, Jung SE, Lee YJ, Kim YS, et al. MR Imaging findings of hydrosalpinx: a comprehensive review. Radiographics. 2009;29(2):495–507.

9. Siegelman ES, Oliver ER. MR imaging of endometriosis: ten imaging pearls. Radiographics.2012;32(6):1675–91.

10. Sohaib SA, Sahdev A, Van Trappen P, Jacobs IJ,Reznek RH. Characterization of adnexal mass lesions on MR imaging. Am J Roentgenol 2003;/180:/1297_304.

11. Valentini AL, Gui B, Miccò M, Mingote MC, De Gaetano AM, Ninivaggi V, et al. Benign and suspicious ovarian masses-MR imaging criteria for characterization: pictorial review. J Oncol.2012;2012:481806

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE5, 2024

12. Adusumilli S, Hussain HK, Caoili EM, Weadock WJ, Murray JP, Johnson TD, Chen Q, Desjardins B. MRI of sonographically indeterminate adnexal masses. AJR Am J Roentgenol. 2006;187:732–740