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Original Research Article

A Hospital Based Observational Sonographic Assessment of Gynecological Masses with its Pathological Correlation

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Abstract

Aim: The aim of this study was to assess the usefulness of Gray Scale Ultrasound and Colour Doppler in differentiating benign and malignant adnexal masses in the population.

Methods: The study was conducted in Department of Radiodiagnosis, Darbhanga Medical College and Hospital, Darbhanga, Bihar, India over a one-year period. This study was done as part of dissertation for post graduate qualification in Radiodiagnosis. Ethical approval for this study was taken from Institute Ethical Committee. Participants were enrolled for this study after taking Informed Consent.

Results: The mean age of patients with benign tumor and malignant tumor was 31.68±8.1 years and 50.37±12.7 years respectively. Mean volume of malignant adnexal masses (938.37±659.37) was significantly higher than benign adnexal masses (278.95±217.11). Score of 0 or 2 was given depending on absence or presence of thick papillary projection. Score of 0 or 4 was given depending on absence or presence of solid areas. Score of 0 or 4 was given depending on blood flow location. If no flow or peripheral flow was present, then 0 score was given. However, if central flow was present, then score of 4 was given. Using this scoring system in our study and taking cut off value for malignancy > 6, we found that out of total 50 patients, 35 (70%) had score between 0-5 and all of them were found to be benign on FNAC/histopathology. 15 (30%) cases had a score between 6-12, out of which 12 (80%) were malignant. Only 3 (20%) cases with score between 6-12 were benign.

Conclusion: The Present study serves to emphasized the role of Ultrasound gray scale and Colour Doppler to differentiate benign from malignant adnexal mass and usefulness of Alcazar scoring system. Important parameters in this study, which helped in differentiating benign and malignant adnexal masses, were: thick papillary projection, thick septa and resistive index<0.4, high velocity/low resistance flow and moderate to abundant flow.

Keywords: Ultrasonography, Doppler, Velocimetry, Transvaginal, Echotexture.

Introduction

The characterization of ovarian masses and distinguishing between benign and malignant pathology is important both to decrease unnecessary anxiety and enable decisions regarding optimal treatment. Benign pathology may be best treated conservatively or in a general gynecology unit using a minimal access approach. Conversely, suspected malignant masses should be referred to specialized units for

further management. Thus prior knowledge of the nature of ovarian masses is essential not only for the patient but in order to organize clinical services in terms of planning, costs and overall management. [1] Transvaginal ultrasonography (TVS) is the most commonly employed imaging modality for the assessment of adnexal masses, and a number of prediction models have been created to maximize its predictive capability. In many countries the risk of malignancy index (RMI) [2] which combines ultrasound features, serum CA125 levels and the menopausal status of the patient is still used to characterize ovarian pathology.

Ovarian tumors are among the most frequent pathophysiological conditions discovered in gynecological practice. Whether they are identified during a routine examination or as a consequence of presenting symptoms or complications, the primary symptoms are usually nonspecific. Pelvic examinations in conjunction with transvaginal ultrasound (TV-US) are the key elements of successful management before definitive diagnosis. An annual gynecologic examination and an annual pelvic examination are recommended for preventive health care. [3] Worldwide, the number of newly diagnosed cases of ovarian cancer is approaching 250,000 per year. [4] Therefore, exclusion of a potentially malignant ovarian tumor is the main objective of every gynecologist. Borderline ovarian tumors, which are histologically defined by atypical epithelial proliferation without stromal invasion, [5] are between benign and malignant ovarian tumors and comprise approximately 15% to 20% of all epithelial ovarian malignancies [6]; therefore, a convergence of efforts to obtain a prompt diagnosis is required.

Patient outcomes have improved with each diagnostic decision that has been made objectively and in a stepwise manner. It has been shown that the International Ovarian Tumor Analysis (IOTA) simple rules (SR) for ultrasound are highly sensitive and specific for predicting ovarian malignancy preoperatively [7]; therefore, their utility in clinical practice has become increasingly significant. Characterization of ovarian pathology is often acquired through pelvic magnetic resonance imaging (MRI) or computerized tomography (CT). Although quality images can be easily obtained with CT and MRI, and although these images can simplify the diagnostic process, the use of these expensive testing modalities should be limited to their recommended indications. Usually, simple serous ovarian cysts do not require detailed investigations; however, other adnexal masses may require more extensive diagnostic imaging evaluations.

Ultrasound is noninvasive, easily available test used for differentiating benign from malignant pelvic masses. It is possible to suspect malignancy on basis of ultrasound and Colour Doppler findings, but definite diagnosis cannot be done based on ultrasound and Colour Doppler findings.2,3Sonographic scoring systems were first used for differentiating benign and malignant adnexal masses, by DePriestet al. [8] and Sassoneet al. [9] But, both of these scoring system were based on Gray scale findings only. In 2003, new scoring system was proposed by Alcazaret al. [10] This new scoring system included both Gray scale and Colour Doppler parameters for differentiating benign from malignant adnexal masses. Important parameters which were used to differentiate benign from malignant adnexal masses were: thick papillary projections, solid areas, blood flow location and velocimetry. The new scoring system proposed by Alcazar, et al had better diagnostic performance then scoring system used by DePriestet al. and Sassoneet al.

The aim of this study was to assess the usefulness of Gray Scale Ultrasound and

Colour Doppler in differentiating benign and malignant adnexal masses in the population.

Materials and Methods

The study was conducted in Department of Radiodiagnosis, Darbhanga Medical College and Hospital, Darbhanga, Bihar, India over a one year period. This study was done as part of dissertation for post graduate qualification in Radiodiagnosis. Ethical approval for this study was taken from Institute Ethical Committee. Participants were enrolled for this study after taking Informed Consent.

Study population included patients fulfilling following criteria:

1. Patients attending Obstetrics and Gynecology out Patient Department (OPD) and suspected to have adnexal mass as per clinical evaluation.

2. Patients agreeing to undergo detailed Sonography and Colour Doppler examination as per protocol including Transvaginal Sonography (TVS) and agreeing to come for follow up scans.

3. Patients agreeing to undergo Fine Needle Aspiration Cytology (FNAC)/Histopathological examination subsequently.

Exclusion criteria

A total of 1011 patients, suspected to have adnexal masses, were examined in Obstretics and Gynecology OPD in one year period and subsequently referred to Radiology department for TVS. Out of 1095 patients, only 650 patients came for TVS and 445 patients didn't came for TVS due to personal reasons including long waiting period. Only 174 patients were found to have adnexal mass on TVS. Out of 174 patients, 101 patients did not come for follow up scans and changed the hospital because they were not satisfied with the treatment and long waiting period. Out of 73 patients, 12 patients were referred to higher centers for advance treatment and 11 patients refused for FNAC/Histopathological examination. Finally, 50 patients were evaluated using scoring system proposed by Alcazar, et al in 2003.

This scoring system may yield a total score of 0 to 12, with the best off value as score of >6.TVS including Colour Doppler was done on Philips HD-11 with 10 MHz probe to assess: volume of tumor, distribution (unilateral/bilateral), wall thickness, inner wall structure, septations inside tumor, papillary projection thickness, presence of solid area and echogenicity, vascularization, resistance index and peak systolic velocity and velocimetry. Blood investigations including serum tumor marker: CA 125 and x ray chest was also done.

Statistical analysis was done using the SPSS Statistical Package. Data was analyzed statistically by one way ANOVA and the Student t test for independent samples. The chi square test was used for categorical data. A probability value less than 0.05 was considered statistically significant.

Results

Table 1: Patient details

Mean age of patient	**Mean±SD**
Benign	31.68±8.1 years
Malignant	50.37±12.7 years
Mean volume of adnexal masses	
Benign	278.95±217.11
Malignant	938.37±659.37

The mean age of patients with benign tumor and malignant tumor was 31.68±8.1 years and 50.37±12.7 years respectively. Mean volume of malignant adnexal masses (938.37±659.37) was significantly higher than benign adnexal masses (278.95±217.11).

Table 2: Scoring System used by Alcazar JL et al.[10]

Value	Thick papillary projections	Solid areas	Blood flow locations	Velocimetery
0	No	No	Not present or peripheral	Other
2	Present	-	-	High velocity/ low resistance
4	-	Present	Central	-

Score of 0 or 2 was given depending on absence or presence of thick papillary projection. Score of 0 or 4 was given depending on absence or presence of solid areas. Score of 0 or 4 was given depending on blood flow location. If no flow or peripheral flow was present, then 0 score was given. However, if central flow was present, then score of 4 was given. If there was high velocity/low resistance, then score of 2 was given. If any other pattern of blood flow was present, then 0 score was given.

Table 3: Correlation of scoring system proposed by Alcazar JL et al.6 with FNAC/ Histopathology report, in our study population

FNAC/Histopathology Report	Score (0–5)	Score (6-12)
Benign adnexal mass	35 (Simple Cyst: 9, Mucinous Cystadenoma: 4, Serous Cystadenoma: 7, Tubo-ovarian abscess: 1, Endometrioma: 7, Peritoneal inclusion cyst: 1, Pyosalpinx: 1, Hydrosalpinx: 1, Granulosa cell tumor: 1 and Benign complex cyst: 3)	3 (Tubercular Tubo-ovarian abscess)
Malignant adnexal mass	0	12 (Mucinous Cystadenocarcinoma: 3, Serous Cystadenoma: 6, Fallopian tube carcinoma: 1, Clear cell carcinoma: 1 and Metastasis: 1)

Using this scoring system in our study and taking cut off value for malignancy > 6, we found that out of total 50 patients, 35 (70%) had score between 0-5 and all of them were found to be benign on FNAC/histopathology. 15 (30%) cases had a score between 6-12, out of which 12 (80%) were malignant. Only 3 (20%) cases with score between 6-12 were benign.

Discussion

Clinicians are faced with dilemma of differentiating malignant tumors from benign masses in patients presenting with pelvic mass. When evaluating pelvic mass, gynecologists first consider ovarian pathology, as ovarian pathology is responsible for 70% of pelvic masses found at exploratory surgery on patients with preoperative diagnosis of pelvic mass. Precise diagnosis is required to decide appropriate treatment in such patients. Benign masses can be treated conservatively or by minimal invasive technique. [11]

Using this scoring system in our study and taking cut off value for malignancy > 6, we found that out of total 50 patients, 35

(70%) had score between 0-5 and all of them were found to be benign on FNAC/histopathology. 15 (30%) cases had a score between 6-12, out of which 12 (80%) were malignant. Only 3 (20%) cases with score between 6-12 were benign. In these 3 patients, Differential Leucocyte count (DLC) showed lymphocytosis and Erythrocyte Sedimentation rate (ESR) was raised. X Ray Chest showed findings suggestive of Pulmonary Koch. Both patients responded when treated conservatively with antitubercular drugs. After three months of treatment, lesion regressed and ascites disappeared. There was one more case also of tuberculosis, presenting as tubo-ovarian mass, but qualified only score 4 because of presence of solid areas only, no flow and no papillary projections were noted. In this patient also, DLC showed lymphocytosis and ESR was raised. Chest X Ray was normal but ultrasound showed multiple enlarged conglomerated mesenteric lymph nodes with ascites. In our study, false positive results were due to tuboovarian mass of tubercular etiology. [12]

Although the practice guidelines recommend that ovarian cancer screening should begin at age 35, [13] our analysis of the clinical and radiologic imaging examinations indicated the need for CA-125 levels in 19 patients younger than 35 years. On the basis of data from a meta-analysis of 6 studies, a CA-125 level greater than 35U/mL has a Se of 69% to 97% and a Sp of 81% to 93% for the diagnosis of ovarian cancer. [14] Laparoscopy is feasible and should be performed for ovarian masses whenever the preoperative US examination has not revealed findings suspicious for ovarian malignancy. [15] As the opportunity to obtain a frozen section is not always available, immunohistochemistry (IHC) techniques as part of the HP evaluation have become one of the main paraclinical examinations for establishing a definitive diagnosis, because each borderline tumor category has IHC features. [16]

Conclusion

We hereby conclude that scoring system proposed by Alcazar, et al can be reliably used to differentiate benign from malignant adnexal masses in Indian population, as this scoring system has high sensitivity and specificity. In our study population, two patients out of fifteen had score of more than 6 and were later found to have tuberculosis. Tuberculosis is a great mimicker, especially in Indian population and can result in false positive result. All patients with score less than 6 were found to have benign adnexal masses. Small sample size was significant limitation of our study and for reaching meaningful conclusion; we hereby propose that Scoring system proposed by Alcazar, et al should be validated by enrolling large population spread across different continents and follow up for at least one year.

References

1. Carley ME, Klingele CJ, Gebhart JB, Webb MJ, Wilson TO. Laparoscopy versus laparotomy in the management of benign unilateral adnexal masses. The Journal of the American Association of Gynecologic Laparoscopists. 2002 Aug 1;9(3):321-6.
2. Jacobs I, Oram D, Fairbanks J, Turner J, Frost C, Grudzinskas JG. A risk of malignancy index incorporating CA 125, ultrasound and menopausal status for the accurate preoperative diagnosis of ovarian cancer. BJOG: An International Journal of Obstetrics & Gynaecology. 1990 Oct;97(10):922-9.
3. American College of Obstetricians and Gynecologists. The role of the generalist obstetrician-gynecologist in the early detection of ovarian cancer. ACOG Committee Opinion no. 280. Obstet Gynecol. 2002; 100:1413-6.

4. World cancer research fund international. Cancer facts and figures.
5. Seidman JD, Cho KR, Ronnett BM, Kurman RJ. Surface epithelial tumors of the ovary. InBlaustein's pathology of the female genital tract 2002.
6. Fischerova D, Zikan M, Dundr P, Cibula D. Diagnosis, treatment, and follow-up of borderline ovarian tumors. The oncologist. 2012 Dec;17 (12):1515-33.
7. Garg S, Kaur A, Mohi JK, Sibia PK, Kaur N. Evaluation of IOTA simple ultrasound rules to distinguish benign and malignant ovarian tumours. Journal of Clinical and Diagnostic Research: JCDR. 2017 Aug;11(8): TC 06.
8. DePriest PD, Shenson D, Fried A, et al. A morphology index based in sonographic findings in ovarian cancer. Gynecol Oncol. 1993;51(1):7−11.
9. Sassone AM, Timor-Tritsch IE, Artner A, et al. Transvaginal sonographic characterization of ovarian disease. Evaluation of new scoring system to predict ovarian malignancy. Obstet Gynecol. 2001;78(1):70−76.
10. Alcazar JL, Merce LT, Laparte C, et al. A new scoring system to differentiate benign from malignant adnexal masses. Am J Obstet Gynecol. 2003; 188(3):685−692.
11. Granberg S, Crona N, Enk L. Ultrasound guided puncture of cystic tumors in the lower pelvis of young women. J Clin Ultrasound. 1989;17(2): 107−111.
12. Potter AW, Chandrashekhar CA. US and CT evaluation of acute pelvic pain of gynaecologic origin in nonpregnant premenopausal patients. Radiographics. 2008;28(6):1645−1659.
13. Daly MB, Axilbund JE, Bryant E, Buys S, Eng C, Friedman S, Esserman LJ, Farrell CD, Ford JM, Garber JE, Jeter JM. Genetic/familial high-risk assessment: breast and ovarian. Journal of the National Comprehensive Cancer Network: JNCCN. 2006 Feb;4(2):156-76.
14. Myers ER, Bastian LA, Havrilesky LJ, Kulasingam SL, Terplan MS, Cline KE, Gray RN, McCrory DC. Management of Adnexal mass. evidence report/technology assessment no. 130 (prepared by the duke evidence-based practice center under contract no. 290-02-0025.). Agency for Healthcare Research and Quality, Rockville. 2006 Feb.
15. Pleş LI, Sima R, Burnei A, Albu DF, Bujor MA, Conci S, Teodorescu V, Edu A. The experience of our clinic in laparoscopy for adnexal masses and the correlation between ultrasound findings and pathological results. Rom J Morphol Embryol. 2016 Jan 1;57(4): 1337-41.
16. BohîlŢea RE, Bacalbaşa NI, Ţurcan N, Cirstoiu MM, Terzea DC, Simion G, Munteanu O, Berceanu C, Brătilă EL. Bilateral serous surface papillary borderline ovarian tumor in 19-year-old patient. Ultrasound, immunohistochemical and therapeutic particularities of reproductive age. Rom J Morphol Embryol. 2017 Jan 1; 58(3):989-95.