EVALUATION OF ADNEXAL MASSES-CORRELATION OF CLINICAL, SONOLOGICAL AND HISTOLOGICAL FINDINGS IN ADNEXAL MASSES

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ABSTRACT

Adnexal mass is a common clinical finding in gynaecological practice. The study aims to find out the diagnostic value of clinical examination, ultrasonography and Ca-125 and its correlation, using Risk of Malignancy Index with histopathological diagnosis in adnexal masses. Clinical records were retrieved of women who had surgical management for adnexal mass in the last 2 years duration. Based on the data, Risk of Malignancy Index values were calculated. It was then compared with histopathological diagnosis. Out of 66 patients, 56 patients had benign tumor and 10 patients had malignancy. The Risk of Malignancy Index values of each patient was calculated which ranged from 8 to 2205 with mean value of 425.52 (SD±41.8). Risk of Malignancy Index sensitivity was 70%, specificity was 96.42%, positive predictive value was 77.78%, and negative predictive value was 95.83%. Risk of Malignancy Index is a reliable diagnostic tool in differentiating benign from malignant adnexal masses.

KEYWORDS

Adnexal mass, Ca-125, ovarian cancer, risk of malignancy index, Nepal

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INTRODUCTION

Adnexal mass is a common clinical finding in gynecology outpatient. Most frequently it refers to masses involving the ovary because of the high propensity of the ovary for neoplasia. Many screening tests like pelvic ultrasound and Ca-125 are used to screen for ovarian cancer in the general population. However, histopathology of the adnexal mass is the gold standard for the evaluation of benign and malignant adnexal masses.[1]

Ovarian cancers are usually diagnosed at advanced stages, with 5-year survival as low as 10%. However, early diagnosis provides 5-year survival rate up to 90%.[2] The study done by Rai *et al*[3] in Bhutan showed that RMI had correlation in diagnosing epithelial ovarian malignancies. High RMI in post-menopausal women having adnexal mass is usually associated with malignancy.Thus RMI can be used as a valuable indicator for early diagnosis of malignancy in adnexal mass. This study aimed to find out the diagnostic value of clinical examination, ultrasonography and Ca-125 and its correlation, using Risk of Malignancy Index (RMI) with histopathological diagnosis in adnexal masses.

MATERIALS AND METHODS

This descriptive retrospective study included all consecutive patients with adnexal masses admitted in Department of Obstetrics and Gynaecology, College of Medical Sciences, Bharatpur, Chitwan from 1stJan, 2018 to 30th December, 2019. Data was retrieved from hospital medical records. Approval for the study was taken from the Institutional Review Board of College of Medical Sciences-Teaching Hospital (Ref No: 2020-038). Convenience sampling method was used. Pregnancy with adnexal masses, mass arising from an abdominal organ on laparotomy (non-gynecologic causes) and patients who do not get operated were excluded from the study. From the hospital records, basic epidemiological data like age, body mass index (BMI), educational level, occupation, and residency and gynecological anamnesis like age of menarche, parity, last menstrual cycle, and presenting complaints were taken into account. Detailed clinical examination findings and standard laboratory analysis including complete blood count and tumor marker levels like Ca125 were also noted down. Ultrasonographic findings of pelvic organs involved analysis of dimensions, multilocular or bilateral, solid/cystic components/parts, metastasis and free fluid presence in relation to adnexal mass. Risk of malignancy index (RMI) was calculated for all the patients, using the formula: RMI = U ×M ×Ca125.[4] In the formula, U represented the ultrasonographic index. One point was assigned to multilocular and bilateral tumors, presence of solid parts in tumor, metastasis and ascites. The sum of these points, were scored so that in the formula U 0 = 0 points, U 1 = 1 points, U 2 - 5 = 3 points. In the formula M represented menopausal status. 1 point was given for premenopausal and 3 points for postmenopausal status. Values of Ca125 were calculated and included directly in the equation. According to the RMI values, the patients were divided into three groups viz., low risk < 25, intermediate risk 25–200 and high risk > 200.[4] The histopathological findings of the excised tumors were analyzed in order to make the final diagnosis and the stage of the disease. The pre-operative findings of the patient were then compared with final histopathological findings to identify factors which could predict the nature and stage of the tumor prior to surgery.

Data entry and analysis was done in the Statistical Package for the Social Sciences SPSS version 16. Descriptive statistics were presented as mean±standard deviation (SD), and the categorical variables were presented as the number of the cases and percentage. Chi-square test was used for the comparison of data.

RESULTS

A total of 66 patients with adnexal mass were included in the study. Among 66 patients, 43 (65.1%) patients were in reproductive period and remaining 23 (34.8%) patients were already in menopause. The average age of presentation was 42.96 years (SD± 13.79) with range from 16 to 69 years (Table 1).

Table 1: Age distribution and Ca-125 levels in patients with benign and malignant adnexal mass

Parameters	Benign tumors			Malignant tumors		
	Minimum	Maximum	Average	Minimum	Maximum	Average
Age (years)	16	66	40.80	31	69	55.1
CA125 (U/mL)	7	213	30.86	12	245	99.8

The mean BMI values of the patients were 28.11kg/m^2 (SD±6.7) with range from 17.34 kg/m^2 to 44.88 kg/m^2. The body mass index (BMI) values of the patients with adnexal masses were calculated and the values were categorized into three groups viz., underweight, normal and overweight. Comparisons were made with histopathological findings which was either benign or malignant. The result was found to be statistically significant ($\chi 2 = 4.26$; df = 1; p=<0.05) indicating that higher the BMI values, the more likelihood the adnexal mass to be malignant.

On ultrasonography, the adnexal mass measured from 1.5cm to 21cm with a mean value of 13.6cm (SD±4.06). The mean value of serum Ca125 was 41.30 (SD±47.68) ranging from 7 to 245. (Table 1) The RMI values of each patient was calculated which ranged from 8 to 2205 with mean value of 425.52 (SD±41.8). According to RMI values, the adnexal masses were categorized into low, intermediate and high risk for malignancy (Table 2). This was then compared to histopathological findings which was either benign or malignant. The result was found to be statistically significant ($\chi 2 = 32.15$; df = 2; p = <0.05) (Table 2).

The risk of malignancy was more frequent in older age groups especially in postmenopausal women. Our risk of adnexal mass being malignant based on RMI findings was statistically correlated with post-operative histopathological findings. The present study shows that adnexal masses are more common in the reproductive age group of 20–49 years, as seen in multiple other studies.[5,6] In the present study, 15.1% of women presenting with adnexal mass had malignancy. This was similar to the study done by Rai *et al*[3] in Bhutan where the incidence of malignancy among adnexal masses was 15.0%. Sharadha *et al*[5] reported an incidence of 4.9% and Javdekar *et al*[7] reported an incidence of 9.5%. Both studies were done in India and reported a low incidence compared to our study. However a study done in Northern India reported incidence of malignancy among adnexal masses was 19.3%.[8] The high incidence of malignancy seen in our study could be due to referral bias since our hospital is a tertiary center catering gynecologic-oncology services.

Our study shows among all malignant adnexal masses, 70.0% was seen in post menopausal women. The finding was similar to a study done in Bhutan.[3] Based upon this findings, we recommend screening of all post menopausal women for malignancy who present to the clinic with adnexal mass because there is a lifetime risk of 1.0%–1.5% of having ovarian cancer as suggested by other studies.[9,10]

Table 2: Risk of malignancy index (RMI) categories in the investigated patients groups

Histopathological diagnosis	RMI(<25)			RMI(25-200)			RMI(>200)		
	Pre-meno-pausal	Post-meno-pausal	Total	Pre-meno-pausal	Post-meno-pausal	Total	Pre-meno-pausal	Post-meno-pausal	Total
Benign (n=56)	31	2	33	8	13	21	1	1	2
Malignant (n=10)	0	0	0	3	0	3	0	7	7
Total (n=66)	31	2	33	11	13	24	1	8	9

There were patients with benign adnexal mass having RMI higher than 200. Those were false positive cases. On the other hand, patients with malignant adnexal mass also had RMI less than 200. Those were false negative cases. The most frequent misdiagnosis based on RMI values were borderline endometriotic cysts and benign mucinous cystadenomas. Therefore, RMI sensitivity was 70.0%, specificity was 96.4%, positive predictive value was 77.8%, negative predictive value was 95.8% and accuracy was 92.4%.

DISCUSSION

Our study showed benign adnexal mass was more common in premenopausal women.

In our study, some benign adnexal mass showed high Ca125 values. It is well known that Ca125 values fluctuate during different phases of menstrual cycle with peak value during menstrual bleeding.[11] Clinical conditions like endometriosis and pelvic inflammatory disease are also responsible for high serum value of Ca125.[12] Even though high serum value of Ca125 is seen in many benign conditions, there are enough evidences in the literature which give high importance to the value of Ca125 in the evaluation of adnexal mass.[13–16] In our

study, out of all benign adnexal mass, 21.4% were endometriotic cysts that could lead to the increase of CA125 levels in the group of women with benign adnexal masses.

The test of proportion for RMI efficiency was highly satisfactory with high sensitivity, specificity, positive predictive value and negative predictive value. Based on our study, RMI could be used to discriminate between benign and malignant adnexal tumors. The results of our study are in correlation with the data from the literature.[17]

The main limitations of this study were its hospital-based nature which lead to referral bias and increased prevalence of malignancies compared to the general population and that color Doppler study was not done for any patient due to resource constraints. Gray-scale ultrasound with color Doppler study and using International Ovarian Tumor Analysis (IOTA) guidelines to describe sonographic features of adnexal masses have shown a high sensitivity and specificity for prediction of malignancy in adnexal masses.[18] In Conclusion, RMI is a reliable diagnostic tool for differentiation between benign and malignant adnexal masses.

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