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Adnexal Masses: Evaluation And Comparison Of All The Risk Of Malignancy Indices.

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ABSTRACT

To compare the diagnostic utility of all four Risk of Malignancy Indices (RMI) in the evaluation of adnexal masses. A prospective cohort study done on 100 patients presenting with adnexal masses in a tertiary care hospital in Chennai. Risk of malignancy is a useful tool in pre-operative diagnosis of malignant ovarian neoplasms, out of which RMI 4 has the strongest correlation due to inclusion of tumour size as an indicator of malignancy.

Keywords: Adrenal masses, malignancy, tumour.

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INTRODUCTION

Ovarian cancer is the most lethal of all gynecological malignancies, ranking 5th in cancer mortality among women worldwide. Since majority of the tumours are initially asymptomatic, they tend to be diagnosed in later stages with nodal and distant metastases, thus effectively reducing the 5-year survival rate. Although histopathology remains the gold standard for diagnosis, pre-operative differentiation between benign and malignant ovarian masses is the key to clinical management and operative decisions.

It is important to note the steady fall in mortality due to cervical cancer since the introduction of Pap smear as an effective screening tool in early diagnosis. With regard to ovarian tumours, the main challenge is the lack of such screening measures. In this scenario, a standardized protocol for preoperative identification of malignant masses would allow optimization of first-line treatment in these women.

Various studies have suggested a combined approach of multiple modalities could be the breakthrough in pre-operative diagnosis. Risk of Mortality index (RMI) was developed by Jacob et al [1] in 1990, which is a simplified scoring system based on the ultrasonogram score, menopausal status and levels of the tumour marker, CA-125.

Currently, there are 4 different types of RMI in practical use, with differences in scoring of the factors. RMI 2 was developed by Tingulstad et al in 1996 and later modified by him in 1999 to RMI 3. Later, in 2009, Yamamoto included tumour size as a factor and thus came into existence RMI 4. The general consensus in modern gynaecology is to consider a RMI score of above 200 to be predictive of malignancy in ovarian masses. In this study, we attempt to evaluate all the pre-operative RMIs and their utility in differentiating benign from malignant ovarian masses by correlation with post-operative histopathological diagnosis.

MATERIALS AND METHOD

Patients of ages above 20 years with adnexal masses were included. Pregnant women and women with simple cysts less than 5cms were excluded. After obtaining a written consent, a detailed history was obtained and a general and gynecological examination was performed.

Venous blood samples were drawn for evaluation of CA-125 using radio-immunoassay prior to surgery. A value of more than 35 U/mL was considered to be suggestive of malignancy.

Patients underwent ultrasound examination using a 3.5 MHz abdominal convex transducer with full bladder or a 7.5 MHz vaginal probe after emptying the bladder at the time of admission. The following features were noted in the ultrasound: Multiloculations, Solid elements, Bi-laterality, Ascites, Metastases and size of the mass.

Menopausal women and those who underwent hysterectomy were scored as M= 3 while premenopausal women were scored as M= 1.

Risk of Malignancy was calculated using the formula: RMI = Ultrasound score X Menopausal score X CA-125 levels in U/mL.

PARAMETER	GRADE	RM1	RM2	RM3	RM4
USG Score (U)	None	0	1	1	1
	1 feature	1	1	1	1
	2 features	3	4	3	4
Menopausal Score (M)	Premenopause	1	1	1	1
	Postmenopause	3	4	3	4
CA-125 (U/mL)	Numerical value	-	-	-	-
Size of the mass (S)	<7cms	-	-	-	1
	≥ 7cms	-	-	-	2

In all the indices, a cut off value of 200 or more was considered to differentiate between benign and malignant lesions.

RESULTS AND DISCUSSION

Our study included a total of 100 patients, out of which 89 cases were benign and remaining 11 cases were diagnosed malignant by histopathology. The mean age in our study was in the reproductive age group of 35.7 years, comparable with another study done by Kannan et al with a mean age of 34.6 years.

However, malignancy was more common above 50 years, with an incidence of 42.6% similar to a study by Ganiy et al, in which malignant cases comprised of 40.81% above 50 years.

Studies conducted by Ganiy et al and Ismail et al showed a statistical significance in the incidence of malignancy in postmenopausal women and in women who underwent hysterectomy. This study showed similar results with regard to postmenopausal status having a significant p value of 0.059. The number of post-hysterectomy cases were too low (2 cases) to show any correlation with malignancy.

USG evaluation was scored with respect to tumour size or volume, number of locules, thickness of tumour wall, septae, echogenicity and solid areas. In this present study, USG proved to be an useful tool with high sensitivity, specificity and negative predictive value in differentiating benign and malignant masses, showing a statistically significant p value of 0.000. A study by Erhand et al showed almost identical results.

Although in practical use for a long time, the utility of CA-125 in predicting malignant tumours in still under debate. In our study with a cut off value of 35 U/mL, it was statistically significant (p=0.000) and was both sensitive and specific. In comparison, Studies conducted by Benjapi et al and Rachmasari et al showed poor specificity and low negative predictive value but the studies done by Ismail et al in 2014 and Kannan et al in 2016 showed results similar to our study.

RMI is a relatively simple scoring system that can aid in pre-operative diagnosis of malignant ovarian cancers. It was calculated for all test subjects and a cut off value of more than 200 was set for RMI 1,2 and 3. RMI 4 was analyzed with a cut off value of 450 to differentiate benign from malignant masses. All 4 indices showed good correlation with malignancy.

With respect to RMI 1, 2 and 3 Van den Akker et al, Ismail et al and Ulusoy et al noted similar results with the same cut off value. However, in a study done by Monirath Hav et al, it was concluded that the performance of RMI was enhanced when cut off was raised to 238 and in the study by Kannan et al, it was 250. Furthermore, Bouzari et al and Hakansson et al reported lower positive predictive value for RMI when compared to our study. It is to be noted that Hakansson performed his study on a larger pool of patients. RMI 4 included tumour size as an indicator of malignancy and was statistically significant in our study.

By comparing the data of all RMIs, we noted that at a cut off of 200, RMI 2 had the highest sensitivity (88.8%) and at a cut off of 450, RMI 4 had the highest specificity (98.9%) and positive predictive value (88.9%). RMI 4 also had the maximum area of distribution under the curve, making it the most reliable indicator. RMI 1 had the least sensitivity and specificity of the four. These findings were comparable to those published by Camila et al.

CONCLUSION

From the findings of our present study, we have observed that although ovarian tumours are common in the reproductive age group, malignant neoplasms are more common post menopause. Both USG and CA-125 correlated significantly with malignancy even when used individually. However, when used in adjunction with one another to calculate the Risk of Malignancy index, their efficacy was improved. RMI 4 was found to be the best indicator of malignancy in pre-operative screening and warrants further study with a larger and more diverse patient pool.

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