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**ORIGINAL ARTICLE**

# A Study Based on the Helpful tool in the Initial Assessment of Ovarian Masses: Risk of Malignancy Index

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## ABSTRACT

**Objective:** To evaluate the Risk of Malignancy Index (RMI)for primary evaluation of ovarian masses.
**Materials and Methods:** This was a prospective observational study conducted for period of two years at DHQ hospital Jhang. Study consisted of 141 female patients admitted for surgical exploration of ovarian masses. Pre-operative ultrasound evaluation of ovarian mass, menopausal status and CA125 were carried out for the patients. Based upon these finding RMI was calculated for all the patients. Post-operative histopathology of resected ovarian mass was done in all the cases to confirm the diagnosis.
**Results:** sensitivity and specificity of CA125 alone at cut off value of 35 was 67.64 %, 83.17% respectively. Using RMI at cut off value of 200 sensitivity and specificity was 76.47%, 85.98 % respectively. Receiver operating characteristic curve (ROC)revealed that RMI was a better discriminate than CA125, ultrasound and menopausal status alone.
**Practical implication:** We can easily apply this tool for detection of ovarian masses.
**Conclusion:** Risk of malignancy index (RMI) is useful tool in primary evaluation of ovarian masses. It can be used to differentiate between benign and malignant ovarian masses with high sensitivity and specificity.
**Keywords:** Risk, Cancer, Malignancy, Benign

## INTRODUCTION

Ovarian cancer is the second common gynecologic cancer in the developed countries and is considered the 4th commonest cause of worldwide deaths due to cancer[1] with the lowest 5-year survival rate of 30–50% among all gynecological cancers[2]. One of the habitually seen indications of the ovarian disease is presence of a pelvic mass, in this way clinical evaluation is an extremely basic step that should be taken to separation among harmless and dangerous masses[3].

The volume of cancer which is left after the essential medical procedures of the high level ovarian carcinoma is one of the main prognostic factor[4-5]. Other principal factors contributing in the guess of the illness are the specialist experience and the sort of activity done[6].Therefore, for gynecologists an exact preoperative finding generally has been stayed a difficult matter as the temporary determination might be utilized for the specific reference of the patients to the oncology habitats and there it tends to be viewed as in decision making for a suitable careful treatment option[7].

As opposed to this, expanded horribleness and mortality because of pointless laparotomies which are completed to analyze ovarian diseases at a beginning phase is likewise a clinical dilemma[8]. Albeit none of the pointers like clinical assessment, ultrasound evaluation, examine of growth markers alone is extremely delicate or explicit for distinguishing danger in ovarian masses yet are by and by as a piece of standard turn out up for adnexal mass. A normalize technique for preoperative assurance of the very conceivable dangerous growths would permit the streamlining of the primary line therapy for ladies experiencing ovarian disease. Early location and reference of the ovarian carcinomas to a gynecological oncologist can assist in right organizing of the sickness and legitimate cytoreductive medical procedures thus upgrading the patient endurance[9].

Jacobs et al presented, a recipe based scoring framework known as chance of threat record (RMI) to diminish the demonstrative situation among harmless and dangerous ovarian cancers[10].

This recipe based scoring framework with 85.4% responsiveness and 96.9% explicitness depends on the menopausal status, ultrasound morphologic highlights, and the serum centralizations of the CA-125 is comprehensively utilized in evolved nations yet its application to expectation risk, in the non-industrial nations is yet to be explained.

The present study has evaluated how accurately the RMI can predict the risk of malignant pelvic masses among patients with ovarian masses.

**Study Protocol:** Patients with adnexal masses scheduled for surgical intervention were inducted in the study from the gynecology outdoor patient clinic at DHQ Hospital, Jhang. Patients with utilitarian blisters under 5 cm, obvious indications of hepatic, peritoneal metastasis, or lung metastasis, analyzed instances of ovarian threat getting chemotherapy, masses emerging from urinary parcel and gastrointestinal lot were prohibited from the review.

Subsequent to getting a composed assent, a full history was gotten and the general and gynecological assessment of the patients was performed. Then these patients went through a transvaginal or transabdominal ultrasound. Transabdominal checks by utilizing a 3.5 MHz transducer and transvaginal examines were finished with a 7.5 MHz transducer. Adnexal masses were assessed for sonographic morphological models: bilaterality, strong regions, multilocularity, ascites, and metastases. Five ml of venous blood was gathered for Serum CA 125 assessment. Strange CA-125 level is characterized as serum levels >35 U/ml.

Menopausal status was noted. Menopause was characterized as at least one year of amenorrhea or ladies who had gone through hysterectomy. Menopausal score was appointed M = 1 if premenopausal and M = 3 if postmenopausal.

In light of information got Hazard of harmful record (RMI) was determined for every patient as

RMI=U X M X serum CA125

Extra imaging modalities, for example, CT sweep or X-ray were performed when ultrasound discoveries were suspicious and to see the degree of infection. Laparotomy was finished in all cases. Examples of the adnexal mass were sent for the histopathological assessment in the division of Pathology.

The histopathological conclusion of resected masses was viewed as best quality level for unmistakable result. Information for CA125, ultrasound score and RMI was dissected independently. Awareness, explicitness, positive like hood proportion and negative like hood proportion were determined at various end levels. Indicative precision CA125, ultrasound, menopausal status and

RMI still up in the air by beneficiary working trademark bends (ROC), customarily ready by plotting awareness against explicitness over recommended scope of scientific qualities

## RESULTS

Histopathology of surgical specimen revealed 107 benign masses (75.9%) and 34 malignant (24.1%). Mean age of the patients with benign masses was 39.41±12. 21 years. Mean age of the patients with malignant masses was 46.35with standard deviation of 17.18. Sensitivity, specificity, Positive Likelihood Ratio, Negative likelihood ratio at different level of CA125 are shown in table. 1. Best performance with regards to this parameters has been at serum CA125 level of 50u/ml. Sensitivity, specificity, Positive Likelihood Ratio, Negative Likelihood Ratio at different levels of RMI reveals overall best performance at cutoff level of 200. Receiver operator characteristic curve (ROC) Fig 1, 2 shows that RMI has highest area under curve.

Table 1: Risk of malignancy index in ovarian cancer patients

| Variables | Sensitivity (%) (95 % CI) | Specificity (%) (95 % CI) | Likelihood Ratio Positive | Likelihood Ratio Negative |
|---|---|---|---|---|
| CA -125 (U/ml)* | | | | |
| 10 | 91.17 (76-98) | 41.12 (31-51) | 4.66 (1.54-14.05) | 0.645 (0.534-0.78) |
| 35 | 67.64 (49-82) | 83.17 (74-89) | 2.57 (1.56-4.21) | 0.248 (0.153-0.4) |
| 50 | 67.64 (49-82) | 87.85 (80-93) | 2.71 (1.66-4.43) | 0.179 (0.102-0.31) |
| 65 | 52.94 (35-70) | 87.85 (80-93) | 1.86 (1.29-2.68) | 0.229 (0.125-0.41) |
| 150 | 32.35 (17-50) | 94.39 (88-97) | 1.39 (1.1-1.76) | 0.173 (0.069-0.43) |
| Risk of malignancy index* | | | | |
| 30 | 91.17 (76-98) | 42.05 (32-51) | 4.76 (1.58-14.36) | 0.635 (0.524-0.77) |
| 100 | 82.35 (65-93) | 75.7 (66-83) | 4.28 (2.05-8.93) | 0.295 (0.204-0.42) |
| 150 | 0 (0-10) | 100 (96-100) | 1 (1-1) | none |
| 200 | 76.47 (58-89) | 85.98 (77-91) | 3.65 (1.98-6.73) | 0.183 (0.11-0.3) |
| 500 | 50 (32-67) | 93.45 (86-97) | 1.86 (1.33-2.62) | 0.13 (0.059-0.28) |

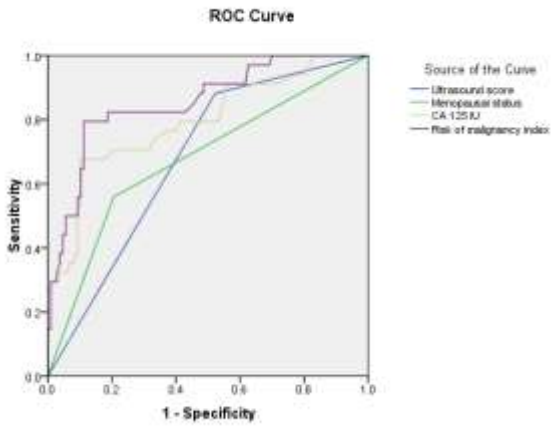


Fig 1: ROC curve for Risk of malignancy index

Table 2: Area Under the Curve

| Test Result Variable(s) | Area |
|---|---|
| Ultrasound score | .679 |
| Menopausal status | .677 |
| CA 125 IU | .794 |
| Risk of malignancy index | .855 |

Table 3: Area Under the Curve

| Test Result Variable(s) | Area |
|---|---|
| Risk of malignancy index | .855 |
| CA 125 IU | .794 |

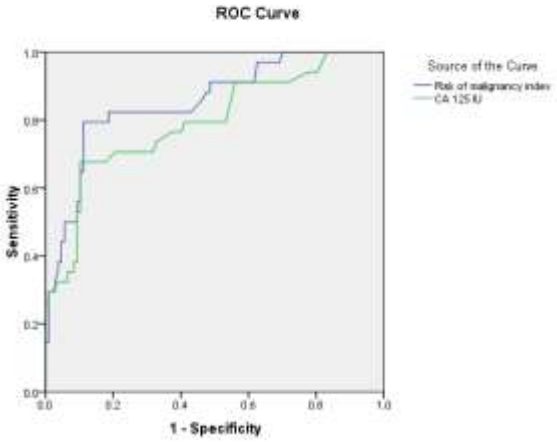


Figure 2: ROC curve for CA 125 and RMI

## DISCUSSION

The Royal College of Obstetricians and Gynaecologists and BSGE joint guidelines report that around 10% of ladies during their lifetime have exploratory medical procedure for the assessment of the ovarian masses[11]. Chances of the patient endurance can be expanded by quick recognizable proof of ovarian tumors and afterward reference to a gynecological oncologist instead of an underlying treatment by broad specialist[12]. As of not long ago no Single strategy is accessible that can precisely foresee ovarian harm, we led this review with speculation that the multiparametric RMI score can be a helpful device in essential assessment of ovarian illness, in low-asset settings.

The mean age of the patients with ovarian mass harmless and threatening in our review is marginally higher than that detailed in 2009 in a comparative report by [13]. In our review, 75.9% of the patients with an ovarian mass had harmless illness and 25.1 % had dangerous sickness. Practically same rates for harmless and threatening are accounted for by Al-Asadiwere 21 (20.8%) dangerous and 80 (79.2%) were harmless[14]. announced higher rate for dangerous and lower rate for harmless growths, threatening cancers comprise 54.76% (69/126) and harmless growths 45.24% (57/126)[15].

Serum CA125 level is generally valued as a helpful biomarker for assessing the gamble of ovarian malignant growth, however other gynecological pathology can likewise expand its levels. Myers et al[16], revealed responsiveness and explicitness of under 80%, for this marker, in the expectation of ovarian diseases. revealed a responsiveness of 78.6% and explicitness of 63.5% for a CA125 cut-off of 35 U/mL (2014)[17]. In our review at cut off worth of 35 particularity is 83.17% (74-89), awareness 67.64% (49-82) which is going in accordance with different examinations. Yet, in our concentrate best execution of CA125 is seen at 50 with particularity and responsiveness 87.85% (80-93), 67.64% (49-82) One more report showed a responsiveness of 88% and explicitness of 97% for CA125 at a higher cut-off of 88 U/mL[18].

RMI was first proposed by in his review he revealed responsiveness of 85.4% and explicitness of 96.9% for this strategy, at a cut-off of 200. Later on a few review and planned investigations detailed it as the most ideal that anyone could hope to find device for triaging and reference of ovarian malignancies[19-20].

## CONCLUSION

Risk of Malignancy Index (RMI) is a useful tool in primary evaluation of patient with adnexal masses and subsequently guiding the patients with high risk of malignancy to gynecological oncology centers for suitable and effective surgical interventions. Simplicity and applicability make it a good option in daily clinical

practice in non-specialized gynecologic departments for the triage of patients and referral to a higher center.

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