

## Risk Malignancy Index as a Useful Tool for Predicting Malignant Ovarian Masses

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### Abstract

Risk Malignancy index is widely used to predict malignant ovarian tumour. The aim of our study is to determine how accurately the RMI can predict malignant ovarian tumours in a high density tertiary care centre. This study is a retrospective review of 35 patients who have attended Gynaecological clinics in Govt Rajaji Hospital Madurai between February to July 2017. Information on menopausal status, ultrasound findings, CA-125 and histopathological examination report was collected and RMI Score was calculated for all patients.

**Keywords:** Malignant ovarian masses; RMI; CA-125.

### Introduction

Ovarian tumours are one of the common causes for gynecological consultation and are usually detected on imaging studies or during laparotomy for abdominal masses. Both benign and malignant ovarian tumour can occur at any age group. Among the commonest cause of cancer deaths world wide, Ovarian malignancy stands fourth [1,2,3]. Ovarian cancers have the least 5 year survival rates (30-50%) [4]. Patients survival can be enhanced by early detection of ovarian cancer and prompt referral to gynaec-oncologist for accurate staging of ovarian tumours and optimal cytoreduction [5]. Histopathological examination is the gold standard diagnostic test for

ovarian cancer. Thus the role of RMI in predicting malignancy is pivotal in improving survival rate of the patients [6].

### Materials and Methods

We conducted this retrospective study at Gynecological clinics at GRH Madurai after obtaining approval from institutional ethical committee. The international classification of diseases, 9<sup>th</sup> Revision, Clinical modification (ICD) 9CM criteria was used to identify adnexal masses. Standard formula was used to calculate Risk Malignancy Index.

### Results

#### Age

The total number of patients in our study was 35. Age of the patients in our study ranges from 18-75 years (Mean age 46yrs). Premenopausal patients were predominant and numbered 22 among patients (62.85%), 13 (37.14%) patients were in the postmenopausal group.

#### RMI

Ten patients (28.5%) had RMI score  $\leq$  200 all whom had benign disease (28.5%) and none of the patient had borderline malignancy. Twenty five patients (71.4%) had RMI score  $>$  200 of whom twenty two (62.8) patients had malignant disease and 3 patients (12%) showed histopathology confirmatory of benign ovarian cyst (Table 1).

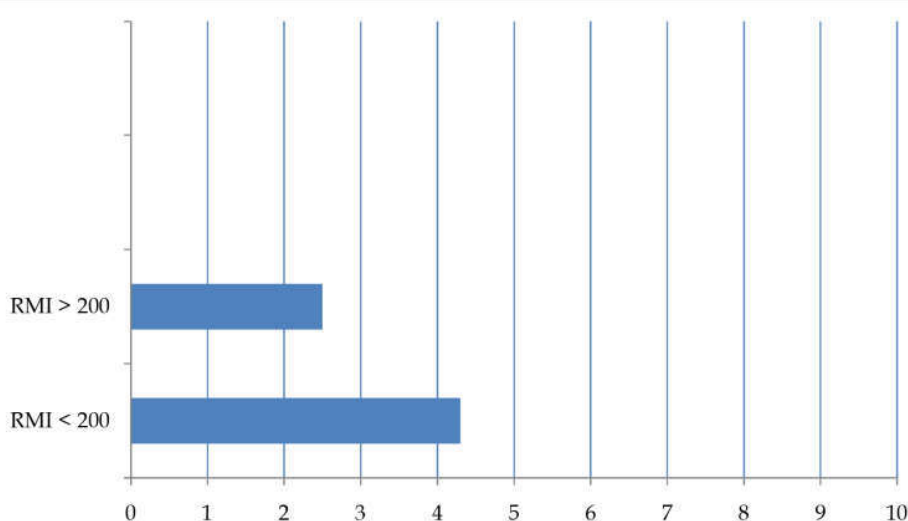
**Table 1:** RMI Score

RMI Score	Benign	Malignant
$\leq$ 200	28.5%	--
$>$ 200	12%	62.8%

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Graph 1:

### CA 125

In our study group 5 patients have > 35 U/ml CA 125 level and 17 patients have >200U/ml CA 125, 13 patients have < 35 U/ml CA 125 level. The mean CA125 level 100 U/ml. (Graph 1).

To detect the credibility of the diagnostic value of RMI we calculate specificity, sensitivity, positive and negative predictive value. (Table 2).

Table 2:

Sensitivity	50%
Specificity	93%
Positive predictive value	55%
Negative predictive value	94%

The diagnostic contribution of CA125>35 U/ml<sup>8</sup>, ultra sound score >3 and menopausal score were compared in predicting malignancy.

Table 3:

Scores	Sensitivity
Menopausal age	68%
Ultra sound score	70.3%
CA125	67%

Ultrasound had the highest sensitivity (70.3%) and highest negative predictive value (96.1%) (Table 3) [7].

### Discussion

RMI I is a combination of presurgical features such as serum CA-125 (CA-125); menopausal status (M); and ultrasound score (U). The RMI is a product of the ultrasound scan score, the menopausal status and the serum CA-125 level (IU/ml) as follows:  $RMI = U \times$

$M \times CA - 125$ .

- The ultrasound result is scored as 1 point for each characteristic: multilocular cysts, solid areas, metastases, ascites and bilateral lesions. If ultrasound score is 0 then U = 0, If ultrasound score is 1 then U = 1, If ultrasound score is 2-5 then U=3.
  - *Menopausal status*: score of 1 is given for premenopausal women and 3 for postmenopausal women.
- Menopause defined as women with amenorrhea for more than one year or in hysterectomized women over the age of 50.
- Serum CA-125 is measured in IU/ml and ranges between zero to hundreds or even thousand of units.

Ovarian cancer may occur at any age group, but more common in menopausal women. Epithelial ovarian cancer is most common type, often diagnosed in stage III or IV with poor prognosis [10].

In women with postmenopausal ovarian cyst with RMI I score of 200 and above we have to subject them to CT abdomen and pelvis. They should be referred to a gynaec- oncologist for multidisciplinary approach.

Risk Malignancy Index should be used as effective guide to triage the postmenopausal women with ovarian cyst into those with low or high risk of malignancy. So that they can be managed accordingly by a general Gynaecologist or Gynaec-oncologist [9].

Jacobs et al. was the first to describe RMI I in 1990 [6]. RMI I Still remains the most effective scoring system. Other modifications such as RMI II, RMI III and RMI IV, has no clinical benefit.

Recommended RMI threshold is 200, but in some early malignancy RMI may be less than 200 and it may be elevated in some benign conditions. Those women who are at low risk of malignancy also need to be triaged into those where the risk of malignancy is sufficiently low to allow conservative management and those who still require intervention of some form.

Based on clinical examination and RMI score of 200 and above if ovarian malignancy is considered then we have to do CT imaging of the abdomen and pelvis, to assess the extent of disease and to exclude differential diagnosis. So that patients can be referred earlier to Gynaec-oncologist. Clinical knowledge has to be applied to decide on further appropriate management of the woman.

OVA1 and Risk of ovarian Malignancy Algorithm (ROMA) are the other scoring system. These scoring system needs specific assays which is practically difficult. The IOTA classification is an alternative for RMI as it has comparable sensitivity and specificity to RMI but require specific ultrasound expertise.

## Conclusion

Risk Malignancy Index (RMI) considered as a easy way of method to detect ovarian malignancy in the high population tertiary care centre.

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