

The Role of Risk of Malignancy Index in the Preoperative Assessment of Patients with Adnexal Masses

Thesis

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دور مؤشر خطر الخباثة في تقييم ما قبل الجراحه للمرضى الذين يعانون من أورام المبيض

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Summary

The aim of the present study is to study the accuracy of the RMI to discriminate between benign lesions and malignant adnexal masses in gynaecologic practice.

The main advantage of this method compared with other diagnostic procedures is that the RMI is a simple scoring system that can be applied directly into clinical practice without the introduction of expensive or complicated methods.

Ovarian tumours can occur at any age in a woman's life but they differ in type, being mostly germ cell tumours in childhood, functional cysts in the reproductive age group and becoming increasingly malignant towards and after menopause. Ovarian cancer is the leading cause of death from gynaecologic malignancies. Most cases are diagnosed at advanced stage where prognosis is poor.

Two groups of premenopausal (120 cases) and postmenopausal (60 cases) were studied.

Each patient in this study was subjected to careful history, examination for The Size, mobility and consistency of the mass on the abdominal examination and P.V. also laboratory examination for CA125, and sonographic assessment.

List of Table

Tab No.	Title	Page
1.	FIGO staging of ovarian cancer	18
2.	Ultrasound Scoring System (Morphology Index)	41
3.	Differentiation between benign and ovarian tumours	64
4.	Comparison between both types of adnexal masses regarding age of patients in premenopausal and post menopausal.....	86
5.	Comparison between both types of adnexal masses regarding parity of patients in premenopausal and postmenopausal women	88
6.	Relation between nature of adnexal masses and menopausal state	91
7.	incidence of various histopathological types of adnexal masses	93
8.	Comparison between both types of adnexal masses regarding CA 125 in premenopausal and postmenopausal women	94
9.	Relation between type of adnexal masses and US score in premenopausal and postmenopausal women	96
10.	Comparison between both types of adnexal masses regarding RMI in premenopausal and postmenopausal women.....	98
11.	An example of a protocol for triaging women using the risk of malignancy index (RMI); data from the present study according to RCOG guidelines in management of adnexal masses:.....	100
12.	Validity of RMI as predictors in patients of adnexal masses using the standard cutoff point of the (RCOG) at this study	100
13.	Validity of CA 125 as predictors in patients of adnexal masses	101
14.	Validity of RMI as predictors in patients of adnexal masses	102

List of Figures

Figure No:	Title	Page
1.	Diagram shows the characteristic appearance of hydrosalpinx.....	21
2.	Pictorial representation of morphology index of ovarian tumours.....	43
3.	The vascular morphology score (VMS).....	66
4.	Comparison between both types of adnexal masses regarding age of patients in premenopausal and postmenopausal.....	87
5.	Comparison between both types of adnexal masses regarding parity of patients in premenopausal and postmenopausal women.....	89
6.	Diagram shows nature of adnexal masses	90
7.	Relation between nature of adnexal masses and menopausal state.....	92
8.	Comparison between both types of adnexal masses regarding CA 125 in premenopausal and postmenopausal women.....	95
9.	Relation between type of adnexal masses and US score in premenopausal and postmenopausal women	97
10.	Relation between type of adnexal masses regarding RMI in premenopausal and postmenopausal women	99

List of Contents

Title	Page
Protocol of the risk of malignancy Index	1
Introduction and aim of the work	6
Aim of the work	8
Review of literature	9
<i>Ovarian tumours</i>	<i>12</i>
<i>Other origins for adnexal masses</i>	<i>20</i>
<i>RMI</i>	<i>25</i>
<i>Other types of RMI.....</i>	<i>28</i>
<i>Ultrasonography</i>	<i>35</i>
<i>CA 125</i>	<i>46</i>
<i>Menopause</i>	<i>49</i>
<i>RCOG Guidlines</i>	<i>50</i>
<i>Other methods for evaluation of adnexal masses.....</i>	<i>58</i>

Patients and Methods	81
Results	86
Discussion of the results	103
Summary	112
Conclusion	114
Recommendations	115
References	116
Arabic Summary	—

List of Abbreviation

AFP	ALPHA FETOPROTEIN
CA 125	CANCER ANTIGEN 125
CASA	CANCER ASSOCIATED SERUM ANTIGEN
CD	COLOUR DOPPLER
CEA	CARCINO- EMBRYONIC ANTIGEN
CT	COMPUTED TOMOGRAPHY
FIGO	THE INTERNATIONAL FEDERATION OF GYNECOLOGY AND OBSTETRICS
IL	INTERLEUKIN
M	MENOPAUSAL SCORE
MI	MORPHOLOGY INDEX
MRI	MAGNETIC RESONANCE IMAGING
NPV	NEGATIVE PREDICTIVE VALUE
OC	ORAL CONTRACEPTIVE
OSE	OVARIAN SURFACE EPITHELIUM
PAI	PLASMINOGEN ACTIVATOR INHIBITOR
PET	POSITRON EMISSION TOMOGRAPHY
PPV	POSITIVE PREDICTIVE VALUE
PSV	PEAK SYSTOLIC VELOCITY
PV	PER-VAGINAL
RCOG	ROYAL COLLEGE OF OBSTETRICIAN AND GYNAECOLOGISTS
RI	RESISTANCE INDEX
RMI	RISK OF MALIGNANCY INDEX
RMI 1	RISK OF MALIGNANCY INDEX 1
RMI 2	RISK OF MALIGNANCY INDEX 2
RMI 3	RISK OF MALIGNANCY INDEX 3
SD	STANDARD DEVIATION
TAS	TRANSABDOMINAL ULTRASONOGRAPHY
TVS	TRANSVAGINAL ULTRASONOGRAPHY
VOCALTM	VIRTUAL ORGAN COMPUTER-AIDED ANALYSIS
U	ULTRASOUND SCORE
UK	UNITED KINGDOM
US	ULTRASOUND
VMS	VASCULAR MORPHOLOGY SCORE
WHO	THE WORLD HEALTH ORGANIZATION
X	MEAN

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The Protocol of Risk of Malignancy Index

Ovarian tumours can occur at any age in a woman's life but they differ in type, being mostly germ cell tumours in childhood, functional cysts in the reproductive age group and becoming increasingly malignant towards and after menopause. (*Parkash et al., 2004*)

Ovarian cancer is the leading cause of death from gynaecologic malignancies. Most cases are diagnosed at advanced stage where prognosis is poor. Several studies have demonstrated that ovarian cancer patients operated by a gynaecologic oncologist are more likely to undergo accurate staging and optimal cytoreductive surgery compared to patients who are operated by general gynaecologists. (*Vernooij et al., 2009*)

The discriminative preoperative evaluation of adnexal masses is rather complicated. A variety of

diagnostic procedures is used, leading to a wide variety of variables which can result in an inaccurate interpretation of the nature of the adnexal mass. (*Van den Akker et al., 2009*).

Efficiency of care for ovarian cancer patients can be improved by standardizing this preoperative evaluation. *Jacobs et al., 1990* developed the Risk of Malignancy Index (RMI) for referral of relevant patients to gynaecologic oncologic centres. The RMI was the first diagnostic model that combined demographic, sonographic and biochemical data in the assessment of patients with adnexal masses.

The main advantage of this method compared with other diagnostic procedures is that the RMI is a simple scoring system that can be applied directly into clinical practice without the introduction of expensive or complicated methods.

Three definitions of RMI were compared; each incorporated menopausal status, ultrasound characteristics of the adnexal mass, serum CA-125 level. The original definition of RMI (RMI 1) was published by *Jacob et al. in 1990*. This was modified and adjusted by *Tingulstad et al., 1996* (RMI 2) and again in *1999* (RMI 3). The three versions of the RMI have been validated retrospectively and prospectively in different clinical studies where a cut off value of 200 showed the best discrimination between benign and malignant adnexal masses, with high sensitivity and specificity levels (sensitivity 51–90%, specificity 51–97%).

The RMI is calculated using the formula $RMI = M \times US \times serum\ CA\ 125$. M refers to the patient's menopausal status, US refers to the ultrasound score, and serum CA-125 is the assayed level expressed in U/ml. For calculation of (RMI 1) and (RMI 3), $M = 1$ for premenopausal and $M = 3$ for

postmenopausal; for (RMI 2), $M = 1$ for premenopausal and $M = 4$ for postmenopausal. Postmenopausal” status was assigned if the woman had more than one year of amenorrhea.

The ultrasound score is calculated according to the presence or absence of the following features: multi-locularity of the ovarian mass, solid areas, bilaterally, ascites, and extra-ovarian tumours (metastases). For calculation of (RMI 1), the U is 0 if none of these features is present, 1 if one feature is present, and 3 if two or more features are present. In the (RMI 2) definition, the ultrasound score is 1 if none or one of these features is present, and 4 if two or more features are present. For calculation of (RMI 3), the ultrasound score is 1 if none or one of the features is present, and 3 if two or more features are present. A normal CA-125 level is defined as < 30 U/ml. More commonly, $30 = \text{U/ml}$ is used as a cut-off point.

A protocol was designed according to data from validation of RMI by *Davies et al 1993*. for triaging women into low risk when ($\text{RMI} < 25$), moderate risk ($\text{RMI } 25\text{--}250$) and high risk when ($\text{RMI} > 250$). A cut-off of 250 was chosen as the threshold for determining whether there was a high index of malignancy, hence justifying surgical operation by gynecological oncologist.

Introduction of the RMI would improve the management of adnexal masses, with a higher percentage of ovarian cancer patients that are operated by a gynaecologic oncologist. At the same time, referral of patients with non-invasive (benign and borderline) lesions would be reduced. (*Van den Akker et al., 2009*).

The aim of the present study is to study the accuracy of the RMI to discriminate between benign lesions and malignant adnexal masses in gynaecologic practice.