Comparison of Ultrasound Score, CA125, Menopausal Status, and Risk of Malignancy Index in Differentiating between Benign and Borderline or Malignant Ovarian Tumors

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Objectives: *To evaluate the diagnostic performances of ultrasound score (US), CA 125, menopausal status, risk of malignancy index (RMI)— in differentiating between benign and borderline or malignant ovarian tumors.*
Material and Method: *Women with ovarian masses who were scheduled to have elective surgery at the Department of Obstetrics and Gynecology, BMA Medical College and Vajira Hospital between May 1999 and December 2001 were included in the study. Ultrasonographic study and CA 125 were examined preoperatively. The RMI was obtained from the ultrasound score, CA 125, and menopausal status. The diagnostic values of each parameter and the RMI were determined.*
Results: *From 175 women, 35 women (20%) had malignant ovarian tumors. RMI yielded better diagnostic performance to differentiate between benign and borderline or malignant ovarian tumors than US score, CA125, and menopausal status in respective order. The optimal RMI to predict malignancy was 0.135 with the sensitivity of 88.6% (95% CI; 81.1%-96.1%), specificity of 90.7% (95% CI; 83.9%-97.6%), positive and negative predictive value of 70.5% (95% CI; 59.7%-81.2%) and 97.0% (95% CI; 92.9%-100.0%) respectively.*
Conclusion: *RMI yielded better diagnostic performance than the individual parameter of ultrasound score, CA 125, or menopausal status in differentiation of benign from borderline or malignant ovarian tumors.*

Keywords: *Risk of malignancy index, Ultrasound score, CA 125, Menopausal status, Ovarian tumor*

J Med Assoc Thai 2005; 88(Suppl 2): S22-30
Full text. e-Journal: *http://www.medassocthai.org/journal*

Malignant ovarian tumors are generally straight forward in clinical presentation especially when they are in advanced stage. However, in some cases especially in early stage cancer, differentiation between benign versus malignant tumors is difficult. A definite diagnosis is obtained by pathologic examination of the resected mass. However in a certain circumstance, correct preoperative diagnosis is crucial and remains a challenge issue for gynecologists. This provisional diagnosis is useful in planning for an appropriate surgical treatment. For examples, a benign ovarian mass could be managed with a minimal invasive surgery, either laparoscopy or mini-laparotomy, while a malignant mass which requires more extensive surgery should be treated by oncologist to provide the most appropriate surgery for the patients.

Several diagnostic imaging studies for pelvic or ovarian mass have been reported such as CT scan, MRI, or ultrasonography (US). Focusing on ultrasonographic procedures, there has been a paradigm shift toward a more sophisticated study. Transabdominal and transvaginal US have played a major diagnos-

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tic role in early years [1]. These simple US are later added with color doppler or multidimensional ultrasonographic technologies for the diagnostic improvement [2]. However, these latter techniques require expensive instruments, special training and expertise. So, simple US still plays a major basic role in general gynecologic practice.

Aside from the imaging studies, serum tumor marker is another useful and simple tool for differentiation between benign and malignant ovarian tumors. The common tumor marker used in this purpose is CA 125. CA 125 is a high molecular weight glycoprotein antigen that is expressed by many coelomic-lining epithelial cells, and is determined clinically by monoclonal antibody. Among many reactive lesions, benign and malignant tumors, most types of epithelial ovarian cancers are well known for being capable of CA125 production [3]. Elevation of serum CA 125 concentrations is documented in 85% of epithelial ovarian cancers, rendering it a useful marker in differential diagnosis and management of an ovarian tumor [4].

However, either US study or CA 125 determination has its own limitation in diagnosis of ovarian tumors. Many authors have attempted to combine these tests together to yield a better diagnostic performance. Risk of malignancy index (RMI) is proposed for clinical use and is found to yield better result in discriminating between benign and malignant ovarian tumors than any single test of morphologic US scores, CA 125, or menopausal status [5-10]. The US features of ovarian tumors commonly studied are the characteristic appearances of cystic wall, septa, vegetations, echogenicity, and extraovarian findings of ascites or abdominal lesions.

We studied the role of US score, CA 125, menopausal status, and the RMI in discriminating benign from malignant ovarian tumors. For the RMI, we used the same parameters as in the other studies namely; menopausal status, CA 125, and US morphologic scores. Regarding the US score, instead of the same US parameters used by Jacob et al. [5] and other studies who reported on the RMI [6-10], we excluded the extraovarian findings and used the US morphologic scoring system according to the criteria set by Ferazzi et al. [11] which focused on the basic features of the ovarian mass itself such as the cystic wall, septa, vegetations, and echogenicity.

Material and Method

This study was conducted after an approval from the Ethics Committee of the institution. Women with ovarian masses who were scheduled to have elective exploratory laparotomy or laparoscopy at the Department of Obstetrics and Gynecology, Bangkok Metropolitan Administration Medical College and Vajira Hospital between May 1999 and December 2001 were included in the study. All women gave their consent forms prior to the study. Serum CA 125 and the ultrasound examination were performed at the time of preoperative laboratory assessment which were usually accomplished approximately within 1 week prior to surgery. Serum CA 125 was determined by radioimmunoassay (Roche, Pennsylvania, USA). US examination were performed using a 3.5-MHz abdominal convex transducer or 7.5-MHz vaginal probe (ALOKA SSD-1400, Japan). The examinations of the following parameters; wall, septa, vegetations, and echogenicity were performed via transabdominal or transvaginal mode as appropriate. A point score was given for each parameter according to the criteria of Ferrazi et al. as shown in Appendix 1 [11]. The total score of US for each woman was obtained by summing the score of individual parameter. The clinical and pathological data included specific age, menopausal status, status of malignancy, and histology from the permanent sections. Histopathological diagnosis was considered as the gold standard. Postmenopausal status was defined as more than one year of amenorrhea or an age of more than 50 years in

Appendix 1. Ultrasound scoring system according to Ferazzi et al [11]

Score	US feature			
	Wall	Septation	Vegetations	Echogenicity
1	≤ 3 mm	None	None	Sonolucent
2	> 3 mm	≤ 3 mm	-	Low echogenic
3	-	> 3 mm	-	-
4	Irregular, mostly solid	-	≤ 3 mm	With echogenic areas
5	Irregular, not applicable	-	> 3 mm	With heterogenous echogenic areas, solid part

women who had had a hysterectomy. All other women were regarded as premenopausal.

Statistical analysis

Data were analyzed using SPSS statistical software version 11.5 (SPSS, Chicago, IL). Descriptive statistics were used for demographic data and summarized as mean with standard deviation or frequency with percentage. Univariate analyses to determine the association of each parameter were performed using Student's t test, Mann Whitney U test, or x2-test as appropriate. The independent association was then determined by logistic regression. The predictive power of each factor and their combinations were assessed by the goodness of fit test at 1% significance and also by the receiver operating characteristic curve (ROC-Curve). The RMI was determined by combining any of the three factors of CA125, US score, and menopausal status after the logistic model test for each factor. The ROC-Curves of menopausal status, US score, CA125, and RMI were constructed to determine the appropriate cut-off value for discriminating benign from borderline and malignant tumors. The diagnostic performances of each test were reported as sensitivity, specificity, positive predictive value, and negative predictive value with their 95% confidence interval.

Results

General features

During the study period, 175 women who underwent elective operation for ovarian masses were included in the study. Mean age of the patients was 40.0 ± 12.8 years. Most of them were premenopausal (144 women or 82.3%). The preoperative serum CA 125 values ranged from 7.6 to 1825.00 U/ml (median, 42.0 U/ml). Ultrasonographic score ranged from 4-17 (median, 6).

The operative procedures performed for the ovarian masses varied from uni- or bilateral salpingo-oophorectomy or combined with total hysterectomy or a complete surgical staging for ovarian cancer depending on the intraoperative findings or result from frozen section. Table 1 shows the menopausal status, US scores, serum CA125, and the RMI of the 175 patients. Benign lesions were more common in this study (140 cases or 80%). Borderline and malignant tumors constituted the rest (35 cases or 20%). Among benign lesions, endometrioma was the most common. Common epithelial tumor was the most common histology among the malignant tumors.

From univariate analyses we found that postmenopausal status, higher US scores, and higher level of serum CA 125 were significantly associated with malignancy. Most ovarian masses in the premenopausal patients were benign lesions or tumors, 86.1% compared to 51.6% in the postmenopausal patients. The median US score of benign lesions was significantly lower than that of malignant tumors (5.5 versus 12.0). Although some benign lesions had high level of CA 125, their median value was still significantly lower than that of malignant tumors, 35.9 U/ml versus 105.1 U/ml. All of the three factors retained their independent associations with logistic regression study.

The values of US score, CA125, RMI and number of women at their cut-off levels according to the benign and borderline or malignant tumors are shown in Table 2. The detail of false positive and false negative cases based on the cut-off level criteria of US score, CA125, and RMI according to their histology are shown in Table 3.

Predictive value of studied factors (benign versus borderline or malignant tumors)

When we tested the actual value of CA 125 or its log number (Ln CA 125), the actual US score, or its re-set up value at various cut-off levels, we found that LnCA125, and US score level at cut off value of 9 yielded the best diagnostic performances. The RMI, which was obtained by the logistic model, provided the best predictive model with the area under curve of 0.95 (95% CI; 90.9-99.0), when using all the three factors in combination at their cut-off values.

The median RMI of all patients was 0.016 (range 0.002-146.0). The median RMI of benign ovarian tumors was significantly lower than that of malignant tumors, 0.012 (0.002-26.89) versus 1.807 (0.01-146.0). The optimal RMI to predict malignancy was 0.135 with the sensitivity of 88.6% (95% CI; 81.1%-96.1%), specificity of 90.7% (95% CI; 83.9%-97.6%), positive and negative predictive value of 70.5% (95% CI; 59.7%-81.2%) and 97.0%(95% CI; 92.9%-100.0%) respectively.

Diagnostic performances of each parameter

The diagnostic performances of sensitivity, specificity, positive and negative predictive value of CA 125, ultrasound scores, menopausal status, and RMI were determined. The detail of their diagnostic values at different cut-off levels are shown in Table 4. The ROC-curves were constructed to evaluate the appropriate cut-off value of each parameter to diagnose benign and borderline or malignant tumors. We found that the RMI and US scores had better perfor-

Table 1. Menopausal status, ultrasonographic (US) scores, serum CA125, and risk of malignancy index of the patients (n=175)

Histopathology	Number of patients (%*)	Number of menopausal patients (%*)	Median US scores (range)	Median CA1 25 (range)	Median RMI (range)
Functional cyst or tumor-like lesions					
Endometrioma	78 (44.6)	0	5 (4-13)	60.2 (15.1-653.2)	0.012 (0-0.80)
Corpus luteum cyst	3 (1.7)	0	6 (5-7)	36.1 (27.1-42.3)	0.007 (01-0.01)
Tubo-ovarian abscesses	3 (1.7)	0	8 (5-9)	47.6 (18.8-142.6)	0.029 (0-0.48)
Benign tumors					
Dermoid cyst	19 (10.9)	2 (10.5)	8 (4-12)	19.9 (7.7-521.2)	0.007 (0-1.56)
Fibroma	3 (1.7)	2 (66.7)	12 (8-12)	26.0 (19.5-26.5)	0.260 (0.03-2.12)
Mucinous cystadenoma	25 (14.3)	10 (40.0)	6 (5-12)	19.9 (10.18-336.1)	0.016 (0-26.89)
Serous cystadenoma	9 (5.1)	2 (22.2)	5 (4-11)	14.0 (7.6-28.4)	0.005 (0-0.14)
Brenner tumor	1 (0.6)	1 (100.0)	13	29.1	2.330
Malignant tumors					
Common epithelial tumors					
Mucinous borderline tumors	4 (2.3)	0	13.5 (11-14)	185.4 (24.2-372.5)	1.854 (0.24-3.73)
Serous borderline tumors	3 (1.7)	3 (100.0)	8 (6-14)	35.0 (22.6-1197.0)	1.807 (0.06-0.14)
Mucinous carcinoma	4 (2.3)	3 (75.0)	9.5 (5-14)	56.7 (12.1-123.7)	3.368 (0.01-9.90)
Serous carcinoma	7 (4.0)	3 (42.9)	13 (11-16)	306.4 (32.5-1300.0)	3.064 (0.90-104.0)
Clear cell carcinoma	5 (2.9)	2 (40.0)	13 (5-14)	74.0 (12.0-1783.0)	0.740 (0.02-142.64)
Endometrioid carcinoma	3 (1.7)	2 (66.7)	12 (11-17)	687.6 (601.5-1825)	48.120 (6.88-146.00)
Squamous cell carcinoma arising from dermoid cyst	1 (0.6)	1 (100.0)	8	83.4	0.134
Germ cell tumors					
Dysgerminoma	2 (1.1)	0	12	101.5 (85.2-117.9)	1.015 (0.85-1.18)
Immature teratoma	1 (0.6)	0	14	86.6	0.866
Granulosa cell tumor	1 (0.6)	0	12	31.1	0.311

* Percentage of patients by tumor histology Abbreviation: RMI, risk of malignancy index

Table 2. Menopausal status, ultrasonographic scores, CA 125, RMI and their cut-off levels of the patients with benign or borderline and malignant ovarian masses

Variables	Benign (n=140)	Borderline or malignant (n= 35)	Total	p value
Menopausal status [n (%)]				
Premenopause	124 (86.1)	20 (13.9)	144 (100.0)	$p < 0.001$*
Postmenopause	16 (51.6)	15 (48.4)	31 (100.0)	
Median ultrasound score (range)	5.5 (4-13)	12.0 (5-17)	6 (4-17)	$p < 0.001$**
Score < 9	126 (90.0)	14 (10.0)	140 (100.0)	$p < 0.001$*
Score ≥ 9	5 (14.3)	30 (85.7)	35 (100.0)	
Median CA 125 level (U/ml) (range)	35.9 (7.6-653.2)	105.1 (12.0-1825.0)	42.0 (7.6-1825.0)	$p < 0.001$**
CA125 < 100	119 (87.5)	17 (12.5)	136 (100.0)	$p < 0.05$*
CA 125 ≥ 100	21 (53.8)	18 (46.2)	39 (100.0)	
Median RMI ± SD	0.012 (0-26.89)	1.807 (0.01-146.0)	0.016 (0-146.0)	$p < 0.001$**
RMI ≤ 0.135	127 (96.9)	4 (3.1)	131 (100.0)	$P < 0.001$*
RMI > 0.135	13 (29.5)	31 (70.5)	44 (100.0)	

* p value by Chi Square test
** p value by Mann Whitney U test

Table 3. Number and percentage of false positive and false negative cases of each parameter

Histopathology (N)	CA 125 [n (%)]	Ultrasonographic scores [n (%)]	RMI [n (%)]
False positive in benign lesions	CA125 ≥ 100 U/ml	US score ≥ 9	RMI > 0.135
Endometrioma (78)	17 (21.8)	2 (2.6)	2 (2.6)
Corpus luteum cyst (3)	-	-	-
Tubo-ovarian abscesses (3)	1 (33.3)	1 (33.3)	1 (33.3)
Dermoid cyst (19)	1 (5.6)	5 (26.3)	4 (21.1)
Fibroma (3)	-	2 (66.7)	2 (66.7)
Mucinous cystadenoma (25)	2 (8)	3 (12.0)	3 (12.0)
Serous cystadenoma (9)	-	1 (11.1)	1 (11.1)
Total false positive benign cases (140)	21 (15.0)	14 (10.0)	13 (9.3)
False negative in malignant tumors	CA125 < 100 U/ml	US score < 9	RMI ≤ 0.135
Mucinous borderline tumors (4)	2 (50)	-	-
Serous borderline tumors (3)	2 (66.7)	2 (66.7)	1 (33.3)
Mucinous carcinoma (4)	3 (75)	1 (25.0)	1 (25.0)
Serous carcinoma (7)	2 (28.6)	-	-
Clear cell carcinoma (5)	3 (60.0)	1 (20.0)	1 (20.0)
Endometrioid carcinoma (3)	-	-	-
Squamous cell carcinoma arising from dermoid cyst (1)	1 (100.0)	1 (100.0)	1 (100.0)
Dysgerminoma (2)	1 (50.0)	-	-
Immature teratoma (1)	1 (100.0)	-	-
Granulosa cell tumor (1)	1 (100.0)	-	-
Metastatic carcinoma (3)	-	-	-
Total false negative malignant cases (35)	16 (45.7)	5 (14.3)	4 (11.4)

Table 4. Diagnostic values of CA 125, ultrasonographic scores, and menopausal status

Diagnostic tests at different levels	Sensitivity (%) (95% CI)	Specificity (%) (95% CI)	Positive predictive value (%) (95% CI)	Negative predictive value (%) (95% CI)
CA 125				
30	83.3 (77.8-88.9)	46.0 (38.7-53.43)	28.57 (21.88-35.26)	91.43 (87.28-95.58)
35	75.0 (68.6-81.4)	48.9 (41.5-56.33)	27.55 (20.93-34.17)	88.31 (83.55-93.07)
40	75.0 (68.6-81.4)	54.0 (46.6-61.34)	29.67 (22.90-36.44)	89.29 (84.70-93.87)
45	72.2 (65.6-78.9)	57.6 (50.2-64.88)	30.59 (23.76-37.42)	88.89 (84.23-93.55)
50	72.2 (65.6-78.7)	60.4 (53.2-67.68)	32.10 (25.18-39.02)	89.36 (84.79-93.93)
100	50.0 (42.6-57.4)	84.9 (79.6-90.2)	46.15 (38.8- 53.5)	86.80 (81.7-91.8)
Ultrasound scores				
7	91.7 (87.6-95.7)	66.2 (59.2-73.2)	41.25 (34.0-48.5)	96.84 (94.3-99.4)
8	91.7 (87.6-95.7)	81.3 (75.5-87.1)	55.93 (48.6-63.3)	97.41 (95.1-99.8)
9	86.1 (81.0-91.2)	89.9 (85.5-94.4)	68.89 (62.0-75.8)	96.15 (93.3-99.0)
10	80.6 (74.7-86.4)	91.4 (87.2-95.5)	70.73 (64.0-77.5)	94.78 (91.5-98.1)
11	77.8 (71.6-83.9)	93.5 (90.0-97.2)	75.68 (69.3-82.0)	94.20 (90.7-97.7)
Menopausal status	48.4 (44.0-55.8)	86.1 (81.0-91.2)	42.90 (35.5-50.2)	88.60 (83.9-93.3)
RMI				
0.100	91.4 (84.8-98.0)	88.6 (81.1-96.1)	66.70 (55.5-77.8)	97.60 (94.0-100.0)
0.135	88.6 (81.1-96.1)	90.7 (83.9-97.6)	70.50 (59.7-81.2)	97.00 (92.9-100.0)
0.500	82.9 (74.0-91.8)	95.7 (90.9-100.0)	82.90 (74.0-91.8)	95.70 (90.9-100.0)
1.000	62.9 (51.5-74.3)	97.1 (93.2-100.0)	84.60 (76.1-93.1)	91.30 (84.6-97.9)

mances than the CA 125 and menopausal status to predict malignancy; the area under curve were 0.95 (95% confidence interval [95%CI]; 90.9-99.0) for the RMI, 0.92 (95% CI; 85.7-98.0) for US scores, 0.75 (95% CI; 64.7-84.7) for CA 125, and 0.66 (95% CI; 54.6-76.8) for menopausal status. The ROC-curves demonstrating the diagnostic performances of CA 125, US scores, and RMI are shown in Fig. 1.

Discussion

Sonographic evaluation of the structure of an ovarian mass in predicting the risk of malignancy have been reported [1,12]. Many investigators have developed the objective US score according to various ovarian morphologies to minimize the examiners' descriptive interpretation which may be varied and not reproducible [1,13]. Many scoring systems based on various ultrasonographic morphologies have been made up for this purpose. These scoring morphologies are for examples: tumor volume, number of locularity, wall thickness, inner wall structure, septal structure, and shadowing or echogenicity or solid area [13-15]. At different cut-off levels of US scores as an indicator for discrimination of benign from malignant tumors, the sensitivity, specificity, positive predictive value (PPV) and a negative predictive value (NPV) from these studies ranged from 74-88%, 40-65%, 28-36%, and 90-95%, respectively. Ferazzi et al., in1997, developed the new multicenter scoring system in determination of malignancy status of ovarian tumors based on the US morphology of the ovarian cystic wall, septa, vegetations, and echogenicity as shown in Appendix 1[11]. Their new scoring system yielded better result than the other previous scoring systems reported in the other studies [1,13-15] with the accuracy, sensitivity, specificity, PPV and NPV of 72%, 87%, 67%, 41% and 95%, respectively.

Although the value of CA125 as a screening test for ovarian cancer is yet unsettled [16], its role for a differential diagnosis of ovarian masses is clearly established [4,17]. Serum CA125 levels were differently expressed in benign versus malignant tumors, the level was > 35 U/ml in 23% and 89 % of benign and malignant ovarian tumors respectively [17].

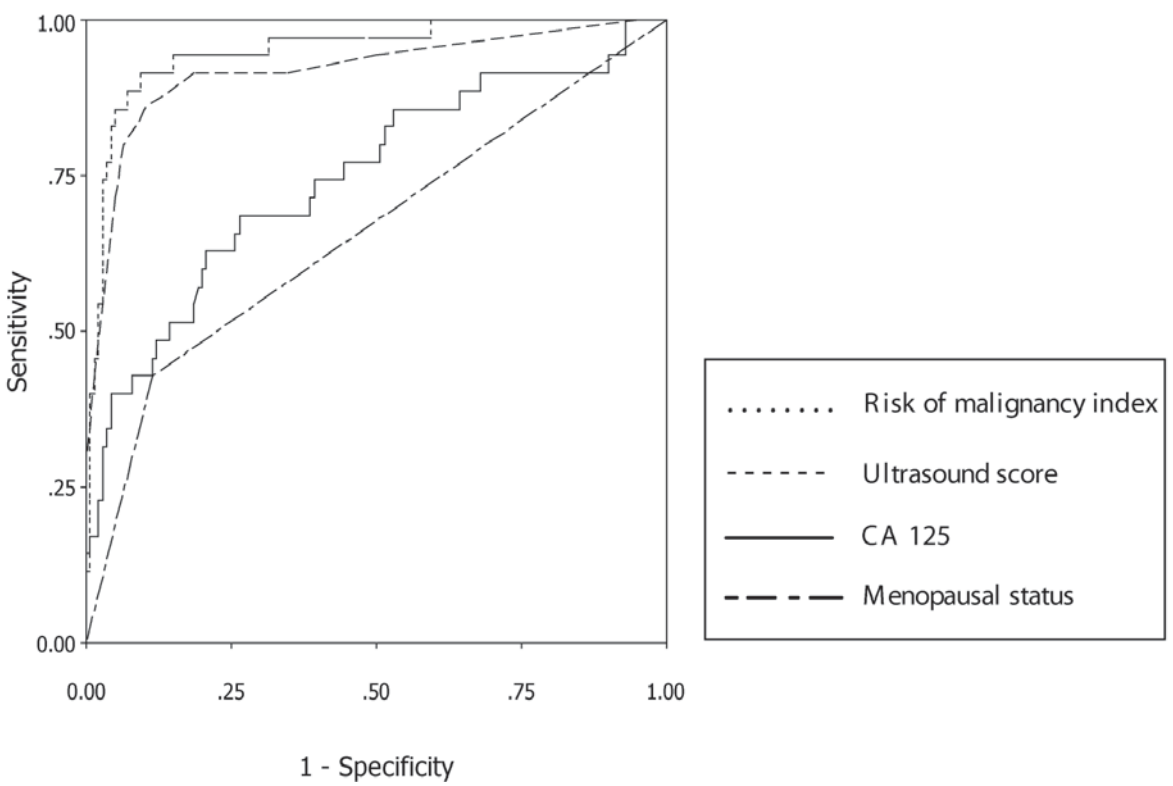

Fig. 1 Receiver-operating curves showing the diagnostic performances of CA125, ultrasonographic scores, and the risk of malignancy index of the patients (n=175)

The study of CA 125 in coupling with abnormal ovarian morphology or ovarian volume constitutes a better predictor of malignancy than that determined by an elevated CA125 alone [18]. The addition of menopausal status to the two tests of CA125 and US morphology have also been studied as well and is called risk of malignancy index (RMI). RMI was proven to improve the diagnostic performances of each test alone in many studies [5-10]. Jacobs et al. were the first group who studied the RMI by simple regression equation analysis of menopausal status, serum CA 125, and US scores which they focused on the morphologic criteria of multilocularity, solid areas, bilateral lesions, ascites, and intra-abdominal metastasis[5]. The authors found that this RMI performed better than any individual test of CA125 or US alone in differentiating between benign and malignant ovarian tumors, at the optimal cut-off score of > 200 to indicate malignancy. Other subsequent studies also showed similar result of better diagnostic performance of the RMI than of each test of CA 125 or US as found in the studies of Jacobs et al. Overall, these studies reported the sensitivity ranging from 71-87%, specificity 84-97%, PPV 66-83%, and NPV 89-93% [5-10]. The actual figures of these diagnostic values might vary from study to study. The difference probably lay on the characteristics of the tumors and associated findings in each case studied. Another reason was the proportion of benign to malignant tumors in each series.

From our study, 35 benign and 140 malignant ovarian tumors had significantly differential expression of the menopausal status, CA 125, and US scores. As an individual parameter, the US score appeared to be the most useful in discriminating benign and malignant ovarian tumors with the highest area under the ROC-curve (Figure 1). Similar to the report of Ferazzi et al., the score of ≥ 9 yielded the maximal area under curve and would be the best indicator of malignant nature of the ovarian mass with the high sensitivity and specificity at 86.1% and 89.9% respectively. While the best performance of CA125 in our study was at 100 u/ml. However, the sensitivity was low at 50%. The poor diagnostic performances of CA125 in our study might lie on the distribution of tumor histology. Half of the false negative cases were non-serous borderline or malignant tumors while 80% of false positive cases were endometrioma which frequently had elevated CA125 level due to peritoneal irritation.

Although with the different US scoring system, our RMI performance was in agreement with the result from other RMI studies that was better than other single parameters with the highest area under curve. Our RMI of ≥ 0.135 yielded high sensitivity and specificity of 88.6% and 90.7%, respectively which were higher than other studies. Of noted, the diagnostic values of RMI from most previous studies used US scoring based on the morphology of the ovarian mass proper and the extraovarian findings as originally set up by Jacob et al. We used the US scoring system of Ferrazi et al. for the RMI, who focused simply on the morphologic changes in the ovarian mass itself. We believed that the abnormal extra-ovarian US morphology, by themselves, should provide clinical evidences of malignancy at a certain level that the scoring system might not yield much further benefit. Furthermore, these basic ovarian US features are easily determined by general gynecologists or sonologists without any special training, so they should be more widely applicable.

The five false negative or malignant cases when the score < 9 and the four false negative when the RMI < 0.135 were either borderline or malignant tumors with only microscopic evidences of cancer. While most of the benign false positive cases from either US score and RMI had similar characteristics of solid tumor such as dermoid cyst or other cystic tumors with hyperechoic content leading to high US and RMI scores. These conditions should be aware of when evaluating the ovarian tumors with ultrasonographic study or the RMI.

Conclusion

RMI is a simple diagnostic tool for discriminating benign from malignant ovarian tumors. Its diagnostic performances are better than the single test of US score or CA125 with only a few numbers of false negative cases. Dermoid cyst with solid content contributes the highest numbers of false positive cases, and this should be aware of in clinical practice.

Acknowledgement

We thank Professor Alan Geater and Ms. Busaba Supawattanabodi for their great contribution to our work.

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Ultrasound Score, CA 125, Menopausal Status, และ Risk of Malignancy Index เพื่อวินิจฉัยแยกโรคระหว่างเนื้องอกรังไข่ชนิดธรรมดากับชนิดก้ำกึ่งหรือชนิดมะเร็ง

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วัตถุประสงค์: *เพื่อศึกษาความสามารถของ ultrasound score, CA 125, menopausal status, และ risk of malignancy index ในการวินิจฉัยแยกโรคระหว่างเนื้องอกรังไข่ชนิดธรรมดากับชนิดก้ำกึ่งหรือชนิดมะเร็ง*

วัสดุและวิธีการ *ผู้วิจัยทำการวัดระดับ CA 125 ในกระแสเลือดร่วมกับตรวจคลื่นเสียงความถี่สูงของก้อนเนื้องอกรังไข่ของสตรีที่กำหนดมารับการผ่าตัดรักษาก้อนเนื้องอกดังกล่าว ที่วิทยาลัยแพทยศาสตร์-กรุงเทพมหานครและวชิรพยาบาล ตั้งแต่ เดือนพฤษภาคม พ.ศ. 2542 - เดือนธันวาคม พ.ศ. 2544 นำค่า ultrasound score, CA 125 และ menopausal status มาคำนวณหาค่า risk of malignancy index และศึกษาความสามารถของค่าเหล่านี้ในการวินิจฉัยแยกโรคของเนื้องอกรังไข่*

ผลการศึกษา: *จากผู้ป่วยจำนวน 175 ราย ที่เป็นก้อนเนื้องอกรังไข่ พบว่ามี ร้อยละ 20 เป็นเนื้องอกรังไข่ชนิดมะเร็ง ค่า risk of malignancy index สามารถให้การวินิจฉัยแยกโรคระหว่างเนื้องอกรังไข่ชนิดธรรมดากับชนิดก้ำกึ่ง หรือชนิดมะเร็งได้ดีที่สุดเมื่อเทียบกับ ultrasound score, CA 125 หรือ menopausal status เพียงชนิดใดชนิดหนึ่ง ค่า risk of malignancy index ที่ดีที่สุด เท่ากับ 0.135 โดยมีความไว ร้อยละ 88.6 (ค่าความเชื่อมั่นที่ ร้อยละ 95 เท่ากับ 81.1-96.1) ค่าความจำเพาะ ร้อยละ90.7 (ค่าความเชื่อมั่นที่ ร้อยละ 95 เท่ากับ 83.9-97.6) ค่า positive predictive value ร้อยละ 70.5 (ค่าความเชื่อมั่นที่ ร้อยละ 95 เท่ากับ 59.7-81.2) และ ค่า negative predictive value ร้อยละ 97.0 (ค่าความเชื่อมั่นที่ ร้อยละ 95 เท่ากับ 92.9-100.0).*

สรุป: *ค่า risk of malignancy index สามารถให้การวินิจฉัยแยกโรคระหว่างเนื้องอกรังไข่ชนิดธรรมดากับชนิดก้ำกึ่งหรือชนิดมะเร็ง ได้ดีที่สุดเมื่อเทียบกับ ultrasound score, CA 125 หรือ menopausal status*