

CORRELATION OF CA-125 AND COLOUR DOPPLER IN OVARIAN TUMOUR

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ABSTRACT

Background information - CA125 is a biomarker that has potential utility across the spectrum: risk assessment, early detection, diagnosis, prognosis, monitoring and therapy.

Methods - Patient attending gynecological outpatient department of obstetrics and gynecology, vinayaka mission medical college, Karaikal were screened by history, clinical examination and symptomatically for adnexal masses. Some were screened with abdominal and transvaginal sonography to a certain, the pelvic mass arises to the ovary. -Clinical history, bimanual examination, Transabdominal ultrasonography was done for all patients fulfilling inclusion and exclusion criteria. Serum CA125 were ascertained by Chemiluminiscent or ELISA.

Results - 40 women were selected and evaluated to assess CA 125 and colour Doppler and their sensitivity and specificity in differentiating benign and malignant tumour. CA125 has sensitivity and specificity of 92.31% and specificity was 70.37% respectively. There was statistically significant difference (P=0.001) in the resistive index and histopathology. The calculated pulsatility index in our study was found to be 96.30% specificity and 92.31% sensitivity. With considering both Resistive index and Pulsatility index the Doppler has sensitivity of 93.3% and specificity of 93%.

Keywords – CA125, pulsatility index, adnexal masses

INTRODUCTION

Ovarian cancer (OC) is a common malignant tumor in gynecology, with the incidence rate ranking the third after cervical cancer and corpus carcinoma. Epithelial ovarian cancer (EOC) accounts for 90% of malignant ovarian tumors, characterized with high recurrence rate, high metastasis rate, and low survival rate. In addition, EOC shows the highest mortality among gynecologic malignant tumors, which poses a serious threat to women's life [1]. The ovary is located in the deep part of human pelvic cavity, and its early lesions are insidious, so early symptoms of ovary-related disease are not obvious.

Traditional examination for OC is mainly based on imaging, but the value of imaging is not high in evaluating early epitheliogenic malignant ovarian tumor or epitheliogenic malignant ovarian tumor with a small lesion range. So exploring a novel method to improve the coincidence rate of diagnosis of early OC and to monitor its development is a hot research topic today [2]. At present, with the rapid development of molecular biology and the continuous progress of laboratory detection technology, increasing molecular tumor markers are found to be closely related to the biological behaviours of OC, and they are also found in

the development and progression of OC.

Abnormal serum CA125 found in ovarian epithelial tumors. Serum CA125 released by normal including ovarian cells, breast cells, pancreatic cells and tissue lining the chest and abdomen. Ovarian cancer inflames the lining of abdomen which contains normal cells that release CA125. Apart from ovarian cancer abdomen cancer elevates CA125 levels.

Non-cancerous condition which elevates serum CA125 level are Liver diseases, recent surgery, benign conditions including fibroid, endometriosis, pregnancy, ectopic pregnancy, ruptured cyst, colon cancer, Inflammatory condition of the abdomen,

(Diverticulitis, Peritonitis, Inflammatory bowel disease, Pelvic inflammatory bowel disease, tuberculosis, pancreatitis). In the last few years colour doppler flow imaging became feasible. Semi quantitative definitions and flow measurements can be performed by identifying the vessel in question. The parameters used in these studies are the resistance and pulsatility index, which are widely used in obstetrics cardiology, neurology in need of doppler flow measurement [3]. Hence the present study was designed to correlate of serum CA-125 level and colour doppler sonography as diagnostic tool of ovarian tumour.

MATERIALS AND METHODS

Study details

This is a Hospital based prospective study conducted in Vinayaka Mission's Medical College and Hospital, Karaikal. Total sample size was 35 with women of age 16 to 55 years age. The study period was 2 years. Patient attending gynecological outpatient department of obstetrics and gynecology were screened by history, clinical examination and symptomatically for adnexal masses. Some were screened with abdominal and transvaginal sonography to a certain, the pelvic mass arises to the ovary.

Methodology

Clinical history, bimanual examination, Transabdominal ultrasonography was done for all patients fulfilling inclusion and exclusion criteria. Serum CA125 were ascertained by Chemiluminiscent or ELISA. After taking permission informed consent taken. These patient underwent transvaginal sonography doppler and ovarian vessels were identified, the blood flow to ovaries to determine resistance index and pulsatile index done by trained ultrasonologists.

Results and discussion

Table 1 - The below tables shows the relationship between colour Doppler, tumour marker, age and risk of malignancy

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	40	24	55	41.85	10.159
CA-125	40	5.70	266.00	52.6550	55.93056
DOPPLER_RI	40	.20	1.30	.7035	.31939
DOPPLER_PI	40	.30	1.90	1.0483	.40868

RISK OF MALIGNANCY	40	10.50	2128.00	277.5293	476.74808
Valid N (listwise)	40				

Table 2 - Relationship between histopathology, tumour marker, colour Doppler and risk of malignancy index

HPE	Percentile	CA-125	DOPPLER_RI	RISK OF MALIGNANCY
Benign	25 th	22.4500	.7000	24.8000
	50 th	28.0000	.9000	41.5000
	75 th	38.5700	1.1000	112.0000
Malignant	25 th	53.6000	.2000	280.0000
	50 th	72.0000	.3000	456.0000
	75 th	137.2000	.5000	856.0000

Table 3. ROC curve for CA-125

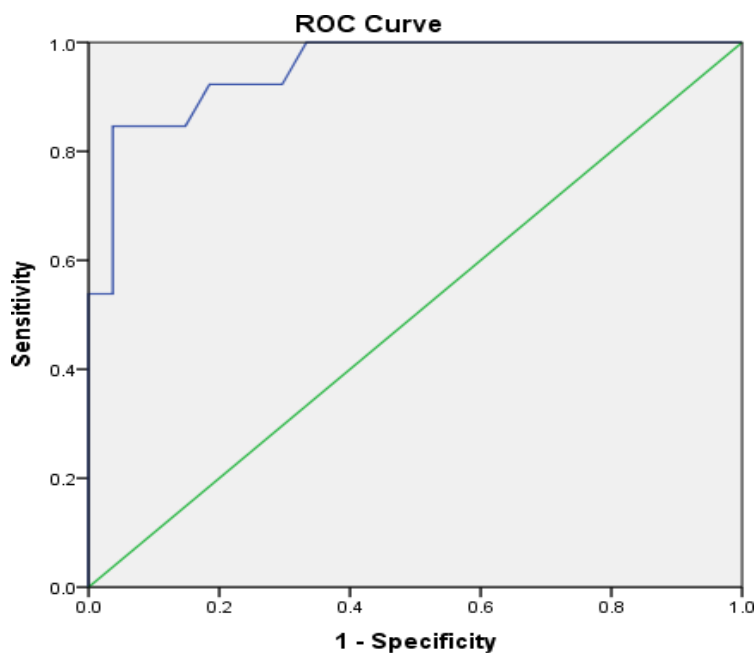


Table 4. Correlation of CA125 results with histopathology

CA-125	HPE		P VALUE
	MALIGNANT	BENIGN	
> 34.61	12	8	
	92.3%	29.6%	
< 34.60	1	19	0.001
	7.7%	70.4%	
TOTAL	13	27	
	100.0%	100.0%	

Area under the curve was 0.952 and when the cut-off value of CA-125 was fixed as

34.6 and above which will favor the diagnosis of malignancy. And the sensitivity, specificity, PPV and NPV are calculated and given below.

Table 4- Results of CA125

Statistic	Value	95% Confidence Interval
Specificity	70.37%	49.82% to 86.25%
Sensitivity	92.31%	63.97% to 99.81%
Positive Likelihood Ratio	3.12	1.71 to 5.69
Negative Likelihood Ratio	0.11	0.02 to 0.73
Disease prevalence (*)	32.50%	18.57% to 49.13%
Positive Predictive Value (*)	60.00%	45.10% to 73.25%
Negative Predictive Value (*)	95.00%	73.99% to 99.22%
Accuracy (*)	77.50%	61.55% to 89.16%

(*) These values are dependent on disease prevalence.

Table 5 - Correlation between colour Doppler –Pulsatility index and CA 125

DOPPLER-PI	HPE		P VALUE
	MALIGNANT	BENIGN	
<0.85	12	1	
	92.3%	3.7%	
>0.86	1	26	0.001
	7.7%	96.3%	
TOTAL	13	27	
	100.0%	100.0%	

Area under the curve was 0.94 and when the cut-off value of Doppler PI was fixed as 0.85 and below which will favor the diagnosis of malignancy. And the sensitivity, specificity, PPV and NPV are calculated and given below.

This study was to establish the prevalence of CA125 and colour Doppler vascular flowmetry in enabling a modality of differentiating benign and malignant ovarian tumour. Our study includes about 40 patients, who were electively planned for laparotomy in view of suspected pelvic malignancies. All the required diagnostic modalities were done. CA125 and Colour Doppler ultrasound were done and resistive and pulsatility index were calculated. The results were compared with the histopathology report. We didn't encounter any case of fallopian tube mass. The results were compared with the previous studies which were mentioned above and discussed as follows.

Epithelial ovarian cancers are most common in women crossed age above 50 years, and who were post-menopausal. In 2009, a study conducted by national cancer intelligence network reported that Epithelial tumours were the most common morphological group of ovarian cancer around 32% of cases and also seen particularly in women aged 45-74 years of age [4,5]. On analysing the menstrual history, nearly half of the postmenopausal women had malignant ovarian tumor. Among menstruating women there was a slightly higher chance of malignancy in those with regular cycles when compared to patients with irregular cycle. These 40 cases were further subdivided into perimenopausal and postmenopausal to determine as of input of risk of malignancy index.

Women with a positive family history of ovarian cancer in the mother and sister have three to four times the risk of ovarian cancer than women without a positive family history. The relevance of history of malignancy and family history of malignancy was not relevant in our

studied 40 cases.

Among all the cases diagnosed provisional ovarian tumour and post –surgical tissue pathology was done .40 cases of cystic epithelial tumour were considered and the correlation of previous value of established resistive index, pulsatile index and CA125 studies done [6,7]. The study did not find statical relationship between age group distribution and histopathological reports tabled. There was significant relationship between menopausal and histopathological reports. These 40 cases have no significant relationship between history of malignancy and any history of family history of malignancy. The relationship shows between age, risk of malignancy, CA125 and colour Doppler value was positive showed significant relationship .this indicates a high degree of probability of difference between benign and malignant ovarian tumour which correlates with age.

The Shizuoka Cohort Study of Ovarian Cancer Screening randomized women from 1985 to 1999 and studied role of CA125 and reported that the sensitivity of 56 % and specificity of 93% in stage 1 disease. In advanced stage it is 73 % and 94.4% respectively. In our study , Area under the curve was 0.952 and when the cut-off value of CA 125 was fixed as 34.6 and which will favour the diagnosis of malignancy and the specificity is 70.37%. and sensitivity is 92.31% [8].

Kurjak and colleague reported that $RI < 0.4$ which was highly sensitive and specific in predicting ovarian malignancy. By regression analysis technique, both Tailor and coworkers and Schelling and associates had found that colour Doppler has high sensitivity and specificity in diagnosing malignant tumours [9].

The eretongsong in march 2008 conducted a study on 306 cases and found that 191 were benign and 115 were malignant. In this study the sensitivity and specificity of the RI was 94.8 % and 93.2% respectively with the cut off value of 0.4 and the values for PI was 93.0% and 92.7% with the cut off value of 1.2.

Area under the curve was 0.92 and when the cut-off value of Doppler of resistive index was fixed as 0.65 and which will favour the diagnosis of malignancy and with sensitivity of 92.31% and specificity of 81.48%. This is similar to the study of Sengoku et al (1994) reported specificity and sensitivity of 91.7% and 81.3% respectively.

Area under the curve was 0.94 and when the cut-off value of Doppler of pulsatile index was fixed as 0.85 and which will favour the diagnosis of malignancy and the sensitivity was 92.31% and specificity was 96.30%

Conclusion

Ovarian tumours are the most common malignant tumour in gynaecological cancers. These are kind of hidden gynaecological malignancy which usually revealed in a stage where the spread has covered extensively. Early detection and prompt treatment is very important in these kind of malignancies. Early diagnosis can increase the survival rate of the cancer patients. With the use of CA125 and colour Doppler sonography as a diagnostic screening tool for ovarian cancer is the best recommended choice. Our study substantiates and confirms towards this recommendation. Being a non-invasive diagnostic modality it can be easily performed without much difficulty, improving patient comfort. Availability of colour Doppler along with ultrasonography at reasonable costs has made it more affordable even to the poor socioeconomic status.

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