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KEY WORDS:

CORRELATION BETWEEN SERUM CA125 LEVELS AND OVARIAN CANCER: ROLE IN DIAGNOSIS AND STAGING.

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ABSTRACT

Introduction: This study intends to find correlation between CA125 (carbohydrate antigen 125) and diagnosis of ovarian cancer and staging.

Methods: Patients with ovarian tumors signed out in the Department of pathology, between January 2017 and December 2018 were included. Serum levels of CA125 were noted. Ovarian tumors were staged according to FIGO staging system .The correlation between CA125 levels and staging and histopathology were evaluated. Chi square analysis was done and p value <0.05 was considered statistically significant.

Results: 50 ovarian cancer patients were included in the study period. The mean age was 48.5+/-10.1 years.Preoperative Ca125 level did not correlate significantly with the stage of ovarian cancer. Highest levels of CA 125 were found in serous tumors. Mean serum CA125 concentration in papillary serous adenocarcinoma patients was 1448+/-310 U/ml whereas in mucinous adenocarcinoma was 760+/- 120 U/ml.

Conclusion : In our study, preoperative CA125 levels correlated well with the ovarian cancer but did not correlate with the FIGO staging.

INTRODUCTION

Ovarian cancer is the sixth most common cancer and seventh most common cause of death among females worldwide (1) .

In India ovarian cancer is ranked the third most common cancer according to population based study, following the carcinoma cervix and breast cancer (2).

Ovarian neoplasm is a heterogenous group of benign and malignant tumors of epithelial, stromal and germ cell origin. Most of the ovarian cancers are usually detected when they have spread beyond the ovary (3).

The investigation of choice, which is often said to be the gold standard, is CA 125 (4).

The discovery of CA125 an antibody that recognizes CA 125 was made by Bob Bast and his colleagues in 1981(5).

For females with ovarian cancer CA 125 levels were found to correlate with tumor burden in 93% of cases(6) .

CA 125 levels are said to be normal when the level is less than 35 U/ml.(6,7) .

A raised level of antigen is detected in ovarian tumors of serous, endometroid, clear cell type, mucinous carcinoma (endocervical variety)(8).

CA 125 is elevated in non ovarian cancers including fallopian tubes, endometrium, endo cervix, pancreas, colon, stomach, gallbladder, kidney, mesothelial lining of pleura, pericardium, apocrine sweat glands etc. (5).

It is also elevated in follicular phase of menstrual cycle, those with benign conditions such as cirrhosis, hepatitis, endometriosis, pericarditis, and early pregnancy(9).

CA 125 is expressed by over 80% of ovarian cancers and rarely at presentation correlate with the risk of malignancy (10).

The aim of this study was to correlate the levels of CA125 with ovarian cancers and with the staging of ovarian cancers.

MATERIALS AND METHODS

The study was conducted in the Department of Pathology, Government Medical College Jammu. Medical records of all the patients with ovarian Cancer between January 2017 to December 2018 were retrieved. Surgical findings such as size of the tumor, histopathology and staging of cancer were also noted. The tumors were staged according to 2009 FIGO staging system and histologically defined according to WHO classification.

Exclusion criteria were bilateral oophorectomy and ovarian cancer.

The surgical specimen were retrieved and the serum CA 125 levels measured were correlated.

Eligibility criteria for the study were women who had CA125 levels measured before the surgery.

RESULTS

Total of 50 cases were included in the study that was conducted over a period of two years by histopathological examination.

Table1 :Cases included in the study.

Serous adenocarcinoma	22
Mucinous Adenocarcinoma	14
Yolk sac tumor	1
Germ cell tumor	2
Dysgerminoma	3
Endometroid adenocarcinoma	4
Mixed germ cell tumor	2
Granulosa cell tumor	2

Mean age was 48.5+/- 10.1 years.

Out of 50 cases 22 cases were of papillary serous adenocarcinoma.

14 cases were of Mucinous adenocarcinoma.
4 cases were of endometroid adenocarcinoma
3 cases were of dysgerminoma.
2 cases each of mixed germ cell and granulosa cell tumor and

there was one case of yolk sac tumor.

Table 2 : shows staging of ovarian cancer

Stage	No. of cases	Serum CA125 levels.
1	6	4220+/-420
2	3	1102+/-120
3	25	1375+/-110
4	4	1400+/-122
Recurrence	7	2420+/-155

CA125 levels were correlated with the stage of the ovarian cancer

Table 3 :shows relation of CA 125 with histopathological type.

Type of tumor	CA125 levels
Serous adenocarcinoma	1448+/-310
Mucinous adenocarcinoma	760+/-120
Yolk sac tumor	138
Germ cell tumor	90+/-25
Mixed germ cell tumor	330+/-55
Endometroid adenocarcinoma	2500+/-200

By conventional method there was a statistical significance between the CA125 serum levels and serous adenocarcinoma and endometroid adenocarcinoma in comparison to other ovarian tumors.

The highest levels were found in serous adenocarcinomas, granulosa cell tumor had the least levels. Mean CA 125 concentration in papillary serous adenocarcinoma patients was 1448+/- 310 U/ml,where as in mucinous adenocarcinoma it was 760 +/-120.

Table no. 4. Correlation of staging and age of the patient.

Stage of tumor	10-19yrs	20-29 yrs	30-39yrs	40-49yrs	50-59yrs	60-69yrs	>70 yrs.
1	0	1	1	3	0	2	2
2	0	0	1	1	2	0	0
3	0	2	3	4	4	4	3
4	0	0	1	2	0	2	0
Recurrence	1	2	1	2	4	1	1

DISCUSSION

A variety of biomarkers have been developed to monitor growth of ovarian cancer and to detect the disease at an early interval(11,12). Amongst them CA125 has been the most extensively studied and clinically utilized serum tumor marker. As a clinical tool, prognostic markers like CA125 may potentially help individualizing treatment within subgroups of patients.

CA125 is a high molecular weight glycoprotein expressed by epithelial ovarian tumors as well as on the surface of cells of mesothelial origin(13).

CA 125 is a glycoprotein expressed in normal tissues originally derived from coelomic epithelium such as peritoneum, pleura, pericardium, fallopian tubes and endometrium and hence levels are elevated in various benign and malignant conditions that involve stimulation of these tissues(14).

Many studies have shown that CA125 levels are elevated in a number of other malignant conditions such as breast cancer, mesothelioma, Non Hodgkin's lymphoma, gastric cancer and leiomyoma and leiomyosarcoma of gastrointestinal origin. Ca125 levels have been found elevated in benign conditions as endometriosis, pregnancy, ovulatory cycles, liver diseases and congestive cardiac failure as well as in infectious diseases such as tuberculosis (15).

Serum levels of CA125 are used to monitor responses to chemotherapy, relapse and disease progression in ovarian cancer patients (16,17).

Levels of CA125 can be elevated in serum before clinical development of primary and recurrent ovarian carcinoma (18).

It is now widely accepted that the tumor marker CA125 is a predictive and prognostic factor in CA125 positive ovarian cancers.

In a study conducted by Hogdall et. al ,it was observed that elevated levels of CA125 are more strongly associated with serous rather than mucinous tumors(19).

In a study conducted by Ashwani Nayak U et al serous tumors showed highest CA125 levels compared to other tumors (1456+/- 320 U/ml)(20).

In our study levels of CA 125 were highest in serous adenocarcinoma and endometroid adenocarcinoma in comparison to other ovarian tumors.

In a study conducted by Edwardo Cambruzzi et al the mean age of the patients was 50.24+/-11.12years(21).

In a study conducted by Ashwani Nayak U et al the mean age of the patient was 47.5+/- 10.2 years(2).

In our study the mean age was 48.5+/- 10.1 years.

In the study conducted by Ashwani Nayak U et. al there was no correlation between CA124 and staging of ovarian cancers, as stage 1 showed levels of CA125 as 4333+/- 432 compared to stage 2 that showed levels of CA125 as 1206+/-123.(2).

Similarly In the study conducted by V Thakur et al in which there was no correlation between levels of CA125 and the FIGO staging of disease. (22).

In our study stage 1 showed CA125 levels as 4220+/- 420 and stage 2 showed levels of CA125 as 1102+/- 120.

CONCLUSION.

Thus it is clear that serum 125 concentration is raised before diagnosis in a significant proportion of ovarian cancers and that a raised concentration is associated with a high risk of ovarian cancer.

However no correlation was obtained between CA125 and staging of the tumor.

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