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Relation between preoperative tumor marker CA-125 levels and epithelial ovarian cancer stage, experience over a two-year prospective study in cancer institute, Kolkata.

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Abstract

Ovarian cancer account for the greatest numbers of mortality from the malignancies of female genital tract and it is one of the leading cause of cancer fatalities in women. Ovarian cancer is a heterogeneous disease and tumors can be categorized based on cells of its origin. Among ovarian cancers, surface epithelial tumors accounts for approximately 2/3rd of all ovarian neoplasm and their malignant forms represent about 90% of ovarian cancers in western world. CA125 is gold standard tumor marker for ovarian cancer and its serum level is used to monitor response to chemotherapy, disease progression and recurrence. So, it is reasonable to investigate whether CA125 has utility as prognostic indicator. In this study we observe ovarian cancer patient for two years (Jan 2018- Dec 2019).

Material and methods: This study was carried out at Chittaranjan National Cancer Institute, Kolkata on 50 histologically diagnosed cases whose serum CA125 levels have been estimated. Considering the stage, the patients were divided in two groups. Group I consisting early stage Ovarian Carcinoma (FIGO Classification I), while group II included advanced disease Ovarian Carcinoma (FIGO Classification II, III & IV). We studied an association between preoperative serum CA125 and known prognostic factors of Ovarian Cancer (stage and recurrence).

Results: Total 50 cases were observed out of which 23 patients belong to group I and 27 patients belong to group II. Ovarian cancer of serous histopathology was commoner than mucinous or other epithelial Ovarian cancer. Preoperative serum CA125 levels were significantly higher for patients with advanced stage II, III, IV (mean 286.6, range 100-473.2) U/ml compared with patients with stage I (mean 128.5, range 17-240) U/ml, for patients with serous carcinoma (mean 245.1, range 17-473.2) U/ml compared with mucinous carcinoma (mean 203, range 25-381) U/ml. Preoperative CA 125 level did not predict recurrence. 15 cases (30%) had recurrence and all belong to advanced stage Ovarian cancer.

Keywords: Preoperative tumor marker, ovarian cancer

Introduction

Ovarian cancer is seventh most commonly diagnosed cancer among women in world. Epithelial Ovarian cancer is the most predominant pathologic subtype. There are 5 major histotypes that differ in origin, pathogenesis, molecular alterations, risk factors and prognosis. CA-125 is most widely used tumor marker in Ovarian cancer and is gold standard and its serum level is used to monitor response to chemotherapy, disease progression and recurrence. It is a high molecular weight glycoprotein which is raised in approximately 90% of patients with advanced epithelial ovarian cancer. CA-125 is adult tissues derived from coelomic (mesothelial cells of pleura, pericardium and peritoneum) & mulleria (tubal, endometrium & endocervical) epithelia. It contain two major antigenic domains A&B which bind the monoclonal antibodies OC125 & M11 respectively. CA-125 level less than 35 U/ml are accepted as normal. CA-125 antigen is a serum marker is widely used in routine investigation. So, it is important to study utility of CA-125 as prognostic indicator so that it can be used in future to individualize treatment of patients with Ovarian cancer. CA-125 is increased in some common benign cases (gynaecological and non-gynaecological condition) and also in malignancy.

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Materials and methods

In this prospective observational study total of 50 cases were studied from the histopathology section of Chittaranjan National Cancer Hospital, Kolkata on surgically resected tumor samples from patients with surface epithelial Ovarian

tumor and those samples were sent to pathology department for gross and microscopic evaluation. CA-125 levels were assessed using bead based immunoassays.

Inclusion criteria –women having ovarian tumor, verified by USG, whose serum CA125 levels have been estimated.

Result and analysis

No. of patients	n	Stage I (>35U/ml)	CA-125, U/ml (mean & range)	Stage II/III/IV (>35 U/ml)	CA-125, U/ml (mean & range)	Total	CA-125, U/ml (mean & range)
Serous	31	06/07(86%)	128.5(17-240)	24/24(100%)	286.6(100-473.2)	30/31(97%)	245.1(17-473.2)
Mucinous	10	08/09(89%)	144.5(25-132)	01/01(100%)	381(381)	09/10(90%)	203(25-381)
others	09	06/07(86%)	57.5(17-81)	02/02(100%)	132.1(121&143.42)	08/09(89%)	80.1(17-143.42)
Total	50	20/23(87%)	128.5(17-240)	27/27(100%)	286.6(100-473.2)	47/50(94%)	245.1(17-473.2)

Total 50 cases were studied. Age of presentation range from 35 to 62 years (mean is 48.5years).23(46%) cases belong to group I and 27 (54%) cases belong to group II. In group I, mean value of tumor marker CA-125 was 128.5U/ml ranging from 17-240 U/ml whereas in group II, mean value of tumor marker CA-125 was 286.6 U/ml ranging from 100-473.2 U/ml. A significant correlation

between stage and CA-125 was found as 20 out of 23(87%) stage I had CA-125 \geq 35u/ml and 27 out of 27(100%) stage II, III and IV had CA-125 level $>$ 35U/ml. Recurrence is seen in 15(30%) cases out of which all 15 cases had advanced stage and serum CA-125 more than 35u/ml (mean 273.05, range 100-346.1 U/ml).

Discussion

References	No. Of patients	Stage I (>35U/ml)	Stage II/III/IV (>35U/ml)	Total(>35U/ml)
Gotlieb <i>et al.</i> (2000) ^[11]	54	19/36(53%)	11/13(85%)	30/49(61%)
Serous	39	16/26(62%)	11/13(85%)	27/39(69%)
Mucinous	10	03/10(33%)	00	03/10(33%)
Others	05			
Ayhan <i>et al.</i> (2007)	60	20/50(40%)	09/10(90%)	26/90(48%)
Serous	38	14/30(45%)	08/8(100%)	22/38(58%)
Mucinous	22	06/20(30%)	01/02(50%)	07/22(32%)
Eva kolwijck <i>et al.</i> (2009) ^[12]	123	46/112(41%)	11/11(100%)	57/123(46%)
Serous	43	20/33(61%)	10/10(100%)	30/43(70%)
Mucinous	80	26/79(33%)	01/01(100%)	27/80(34%)
Pooled Analysis	325	126/271(47%)	45/54(83%)	171/325(53%)
serous	161	68/116(59%)	39/45(87%)	107/161(67%)
Mucinous	164	58/155(37%)	06/9(67%)	64/164(39%)
Present study	50	20/23(87%)	27/27(100%)	47/50(94%)
Serous	31	06/07(86%)	24/24(100%)	30/31(97%)
Mucinous	10	08/09(89%)	01/01(100%)	09/10(90%)
Others	09	06/07(86%)	02/02(100%)	08/09(89%)

Currently clinically accepted serum marker for Ovarian tumor is CA-125, it is a high molecular weight mucin.CA-125 is generally used in conjugation with imaging, biopsy and associated clinicopathological information prior to setting a diagnosis and prognosis. Serum CA-125 $>$ 35U/ml are considered to be elevated. Out of 50 cases 23(46%) belong to Stage I and 27(54%) to Stage II, III, IV.As Ovarian cancer is mostly asymptomatic in early stage and is diagnosed at late stages.87% of cases of Stage I serum CA125 $>$ 35U/ml with mean value of 128.5U/ml which is less compared to advanced stages where 100% of cases of stage II, III, IV shows serum CA-125 $>$ 35 U/ml with mean of286.6 U/ml. Also, serous histology (97%) was more common than mucinous (90%) histology with mean value of CA-125 of 245.1 U/ml compared to203 U/ml in mucinous histology. Recurrence is seen in 15 patients (30%), out of which all patient belongs to high advanced stage.

Conclusion

CA- 125 antigen is sufficiently validated and so widely used in routine investigation. Although its level is increased in

some common benign conditions and also in malignancies, its role as prognostic indicator is still used as a gold standard tumor marker for Ovarian Cancer and its serum level is also used to monitor response to chemotherapy, disease progression and recurrence. In the current study there was significant relation between serum CA125 level and histologic stage and recurrence. Although preoperative CA-125 level didnot predict recurrence.

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