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CORRELATION OF SERUM CEA AND CA19-9 LEVELS WITH COLORECTAL CANCER IN KASHMIRI POPULATION, A HOSPITAL BASED OBSERVATIONAL STUDY.

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ABSTRACT

BACKGROUND: Colon cancer is a complex, multistep cancer in terms of molecular genetics. Colon cancer is believed to be caused by a cascade of genetic mutations leading to progressively disordered local DNA replication and accelerated colonocyte replication. . Several screening tests have been developed to carry diagnosis of colon cancer early, as well as adenomas. Objectives: To evaluate the role of two important tumor markers in the diagnosis of colorectal cancer, the carcinoembryonic antigen (CEA) and carbohydrate antigen CA19-9.

MATERIALS AND METHODS: The present study was conducted in the department of Surgery of Government Medical College and hospital Srinagar. Total numbers of subjects included were 200 out of which 100 were colorectal cancer patients and 100 healthy subjects visiting Govt. Medical College hospital Srinagar. 7 ml venous blood sample were collected after overnight fasting and serum was analyzed for CEA & CA- 19-9 by enzyme-linked immunosorbent assay (ELISA).

OBSERVATIONS: The mean age of patients in our study in the two groups was 52.9±10.54 and 48.7±11.04 respectively. The difference being statistically insignificant with a p-value of 0.787. We also observed that CEA levels get significantly raised in patients with colon cancer than in normal patients. The mean CEA levels in patients in our study were 7.3±3.335 while as in the control group was 1.4±0.625. The difference being statistically significant. (p value < 0.001). We also observed in our study that serum CEA levels correlated with the stage of the disease, Mean CEA levels in stageIV disease were 10.12±2.969 as compared to mean levels of 4.63±3.471 in stage II disease. The mean CA19-9 levels in patients with colorectal cancer in our study were 46.73±18.59 compared to 12.72±9.081 in controls. The difference being statistically significant (p-value < 0.001).

CONCLUSION: Form this study we strongly emphasize that all patients having diagnosed or suspected colorectal cancer should be evaluated with pre-operative serum CEA and Ca19-9 levels.

KEYWORDS :

Cancers are characterized by abnormal cell growth with the potential of invasion and metastasis to other parts of body. Cancers are named based on their origin those derived from epithelial tissue are called carcinomas, those derived from mesenchymal tissues are sarcomas, and those derived from hematopoietic tissue are leukaemias or lymphomas[1]. The vast majority of human cancers are characterized by multiple genetic abnormalities, each of which contributes to the loss of control of cell proliferation and differentiation and the acquisition of capabilities, such as tissue invasion and neo angiogenesis. Many cancers go through recognizable steps of progressively more abnormal phenotypes: hyperplasia, adenoma, dysplasia, carcinoma in situ, to invasive cancer. Multiple cumulative mutational events are invariably required for the progression of a tumor from normal to fully malignant phenotype. Colon cancer is probably the complex, multistep cancer in terms of molecular genetics. Colon cancer is believed to be caused by a cascade of genetic mutations leading to progressively disordered local DNA replication and accelerated colonocyte replication. Colorectal cancer is the third most commonly diagnosed malignancy in men (663,000 cases, 10%) and second in women (570,000 cases, 9.4%) worldwide. Almost 60% of the cases occur in developed regions. About 608,000 deaths from colorectal cancer are estimated worldwide according to globocon 2008 which makes it fourth most common cause of death from cancer. In both sexes, and rates second and third origin of cancer-related death in those areas respectively[2]. Several screening tests have been developed to carry diagnosis of colon cancer early, as well as adenomas. Like many other cancers, colon cancer is usually more treatable when diagnosed early stage before metastasis.

We evaluated the role of two important tumor markers in the diagnosis of colorectal cancer, the carcinoembryonic antigen (CEA) and carbohydrate antigen CA19-9.

MATERIALS AND METHODS:

The present study was conducted in the department of Surgery of Government Medical College and hospital Srinagar. Total numbers of subjects included were 200 out of which 100 were colorectal cancer patients and 100 healthy subjects visiting Govt. Medical College hospital Srinagar.

INCLUSION CRITERIA:

- Colorectal cancer patients diagnosed histopathologically after a colonoscopy guided biopsy irrespective of stage of disease.
- Clinically diagnosed colorectal cancer patients based on clinical history, laboratory investigation and radiological evaluation.

EXCLUSION CRITERIA;

- Patients with history of alcoholism.
- Patients having inflammatory bowel disease (ulcerative Colitis or Crohn's disease).

7 ml venous blood sample were collected after overnight fasting and serum was analyzed for following tumour markers by enzyme-linked immunosorbent assay (ELISA).

- CEA
- CA- 19-9

RESULTS AND OBSERVATIONS:

Table 1: Mean age distribution of patients in our study.

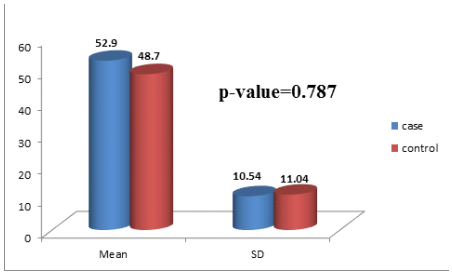

Table 2: Gender distribution of patients in our study.

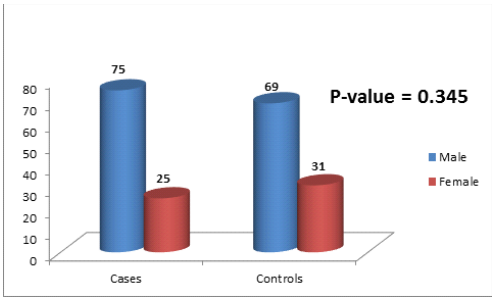

Table 3: Comparison among cases and controls based on CEA levels

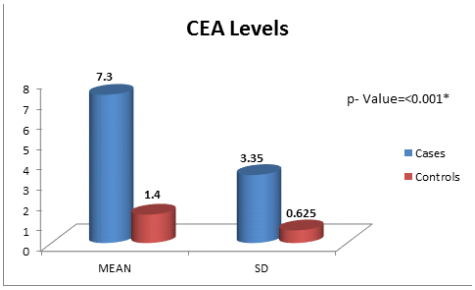

Table 4: Comparing CA19-9 levels between cases and controls.

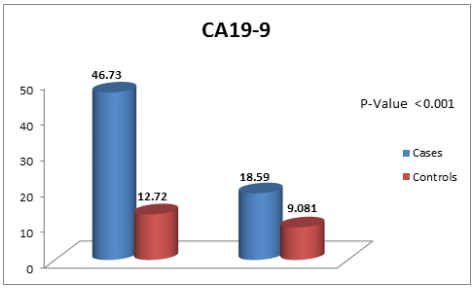

Table 5: Showing correlation of CEA marker with stage of disease				
Stage	**N**	**Mean**	**SD**	**P-value**
II	29	4.63	3.471	<0.001*
IIA	8	5.91	1.324	
III	40	7.89	1.953	
IV	23	10.12	2.969	

Table 6: Showing correlation of CA19-9 marker with stage of disease				
Stage	**N**	**Mean**	**SD**	**P-value**
II	29	41.45	14.42	0.024*
IIA	8	42.69	8.791	
III	40	45.31	11.81	
IV	23	52.24	12.92	

DISCUSSION:

CEA has been widely used as a tumour marker of colorectal cancer. Subsequent studies reported that CEA also resides in normal colorectal mucosa and that the CEA content is markedly higher in tissue extracts of colorectal cancer than in tissue extracts of normal colorectal mucosa [3,4].

CEA has been reported to participate in intercellular adhesion, protection against anoikis (apoptosis associated with cell detachment from the extracellular matrix), and increased metastatic potential [5]. Studies in experimental animals have shown that colorectal cancer cells that produce high amounts of CEA have high metastatic potential [6]. We tried to study the role of serum CEA and CA19-9 levels in predicting the occurrence of colorectal cancer. The mean age of patients in our study in the two groups was 52.9±10.54 and 48.7±11.04 respectively. The difference being statistically insignificant with a p-value of 0.787. We observed that CEA levels get significantly raised in patients with colon cancer than in normal patients. The mean CEA levels in patients in our study were 7.3±3.335 while as in the control group was 1.4±0.625. The difference being statistically significant. (p value < 0.001). We also observed in our study that serum CEA levels correlated with the stage of the disease, Mean CEA levels in stageIV disease were 10.12±2.969 as compared to mean levels of 4.63±3.471 in stage II disease. The difference being statistically significant with a P-value of <0.001. A correlation between stage of CRC and preoperative CEA levels has been observed in some previous studies also [7,8]. Bin bin su *et al* also suggested that preoperative CEA levels also correlated with stage of disease, while providing a prognostic determinant of survival [9]. CA19-9 is also an important tumour marker of gastrointestinal tumours. The mean CA19-9 levels in patients with colorectal cancer in our study were 46.73±18.59 compared to 12.72±9.081 in controls. The difference being statistically significant (p-value < 0.001). Stiksma j *et al* also suggested in their study that CA19-9 is a useful tumor marker besides CEA in monitoring colorectal cancer[10].

CONCLUSION

Form this study we strongly emphasize that all patients having diagnosed or suspected colorectal cancer should be evaluated with pre-operative serum CEA and Ca19-9 levels. This not only helps in strengthening the suspicion of colorectal cancer but also has a prognostic value. The levels of both the tumour markers also correlate with the stage of the disease.

Conflict of interest: The authors declare no conflict of Interest.

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