ISOLATION OF AN ISOMERIC SPECIES OF CEA AND ITS CLINICAL EVALUATION

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An isomeric species of CEA (CEA-S) was isolated from metastatic liver tumor from colon cancer, according to the method of Edgington et al., by PCA extraction, Sepharose 4B gel filtration, DEAE cellulose chromatography, Sephadex G-200 gel filtration, Isoelectric focusing and Isopyknic density gradient ultracentrifugation.

Our CEA-S has a density of 1.41g/ml in Cesium chloride, a homogenous isoelectric point of 4.5 and an estimated molecular weight of about 200,000. Amino acid composition of our CEA-S is quite similar to that of Edgington et al.. In carbohydrate composition, however, sialic acid and N-acetylgalactosamine are not detected, and N-acetylglucosamine is 9.5 percent and neutral sugar is 18.2% as a portion of the total weight of our CEA-S.

Antiserum in CEA-S RIA was prepared by immunization of rabbits with the purified CEA produced by Ishikawa.

Serum CEA-S levels in patients with various diseases were measured by RIA of double antibody technique. In this assay 10ng/ml was acceptable as the upper limit of normality.

High positivities were seen in colon cancer (67.3%), gallbladder cancer (100%), hepatoma (83.3%), pancreas cancer (63.6%), and medullary thyroid cancer (75%), but very low positivities in non-gastrointestinal malignancies; lung cancer (8.3%), uterine cancer (10.5%), and breast cancer (0%).

Positivities were very low in benign diseases (14.8%), though pancreatitis and liver cirrhosis showed relatively high.

Compared to conventional CEA assays, CEA-S assay shows equally high positivities in gastrointestinal malignancies but very low in non-gastrointestinal malignancies and benign diseases.

CEA-S assay appears equally sensitive to CEA of gastrointestinal origin but detects only a small subgroup of breast, lung, uterus and other types of tumors. So CEA-S is considered to be more specific to gastrointestinal cancer than CEA.

SERUM FERRITIN IN PATIENTS WITH VARIOUS MALIGNANCIES

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Ferritin is an iron storage protein arising mainly from the liver cells and reticuloendothelial system. Recently, it has been indicated that the serum ferritin levels in some malignancies is elevated. Ferritin levels in the serum of male and female controls and patients with various malignancies were measured by an immunoradiometric assay.

The mean serum ferritin levels in males, 123.8± 60.9 ng/ml, were significantly higher than those in females, 29.3±26.4 ng/ml ($p<0.001$). The normal upper ferritin values were determined to be 250 ng/ml in males and 82 ng/ml in females respectively, which are equivalent to each mean value plus twice of each standard deviation.

Among 274 patients with various malignant tumors, 132 (48%) showed abnormally high ferritin values and especially abnormal ferritin levels were seen in esophageal cancer, gastric cancer, ovarian cancer, uterine cancer and hepatoma at a relatively high rate.

Serum ferritin levels in uterine cancer were analyzed according to its staging. The mean ferritin values were 69.4 ng/ml in uterine cancer patients of carcinoma in situ, 73.2 ng/ml in stage I, 157.7 ng/ml in stage II and 309.4 ng/ml in stage III,IV, respectively. There was a tendency for the ferritin values to be higher, relative to the stage, in patients with uterine cancer.

Ferritin values showed no correlation with CEA or LDH values.

Serum ferritin may prove to be a useful value for one of the diagnostic purposes of malignancies, though it must be taken into consideration that high ferritin levels are also found in patients with iron overload states and with liver disease.