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RADIOIMMUNOASSAY USING PURIFIED CEA BY ANTI- $\alpha_1$ -ACID GLYCOPROTEIN CHROMATOGRAPHY. Hamazu, M\*, Ochi, Y\*\*, Hosoda, S\*\*, Miyazaki, T\*\*\*, Hachiya, T\*\*\* and Kajita, Y\*\*\*. Dept of Radiology\* and Internal Medicine\*\*, Shiga Univ. of Medical Science and Kyoto Prefect. Univ of Medicine\*\*\*.

Commercially available radio-labeled CEA preparations (Roche and CIS) had the immunoreactivity with anti- $\alpha_1$  acid glycoprotein (AG) (Dako, Miles and Hoechst). This fact suggests that CEA has the immunological similarity with AG. Thus, purification of  $^{125}$ I-CEA (Roche and CIS) by the affinity chromatography using anti-AG bound to Sepharose was performed. When  $^{125}$ I-CEA was applied to the column, the unbound fraction (UF) to the column showed decreased reactivity with either anti-AG or anti-CEA. However, the bound fraction (BF) showed significantly enhanced reactivity with either anti-AG or anti-CEA.

The UF and the BF from  $^{125}$ I-CEA preparation of Roche and CIS'kit was incubated with anti-CEA preparation of each kit, and standard curve of the RIA for determination of CEA was drawn. In both RIA methods the BF showed significantly steep curve with high binding, while the UF showed flatted curve with low binding. Standard curve using the BF was significantly improved in comparison with the before fractionation. By the practical determination of CEA amounts in test sample the improvement of sensitivity and accuracy were found. By this method the purification of CEA is possible.

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THE RELATION OF CEA AND ALKALINE PHOSPHATASE LEVELS WITH THE BONE METASTASIS OF LUNG CANCER. T.Kitano, Y.Fukunaga, T.Nakasuji, S.Kimura, K.Fukuda, M.Takada, T.Takao and A.Ichinosawa. Osaka Prefectural Habikino Hospital

In this experiment a sample of 200 lung cancer patients in the early stage (stages I through III in the TNM classification) were for purposes of comparison measured for bone scintigram, blood serum CEA, and alkaline phosphatase (ALP). In each lung cancer tissue type about 50% of cases tested positive for bone scintigram. In cases of adenocarcinoma, CEA and ALP levels were found to be much higher than normal, at least one exhibiting high levels in 83% of cases. No such striking results were obtained in squamous carcinoma cases, CEA and ALP levels both falling within the norm in 71% of cases.

As a result of these observations, we see that if we take the extreme accumulation of nuclide in bone tissue as the criterion for metastasis, it is not necessarily true that in a high percentage of cases bone metastasis is accompanied by an increase in ALP, as has been reported. We see that there is no such increase in cases of squamous carcinoma. However, we also see that in most types of cases, observation of CEA and ALP levels may allow us to predict changes in bone tissue.

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ENZYMEIMMUNOASSAY OF CEA. A COMPARATIVE STUDY. T.Yatabe, A.Kuroda, K.T.Inaba, K.Chiba, H.Murata & H.Yamada. Tokyo Metropolitan Geriatric Hospital

Enzymeimmunoassay (EIA) has several advantages over RIA, that is EIA has longer shelf-life and dose not use radioisotope. Disadvantages of EIA supposedly include more assay steps needed and possible inferior sensitivity. The purpose of this paper is to compare results obtained by EIA and RIA of CEA.

Absorbance of substrate solution was changed with time after stopping enzyme-substrate reaction. However values of CEA obtained immediately and 150 minutes after putting a stop to the reaction showed an excellent correlation ( $r=0.9995$ ) and differences of values were less than 1%. Response-error-relationship of both EIA and RIA was almost similar. Between-assay reproducibility was 10.6 in RIA. However long-term quality control chart of RIA showed increase of values of QC samples in assays performed for recent three months. While CV % of between-assays of EIA was 7-8% and comparable with RIA. EIA showed extremely good results in dilution study up to 160 times dilution. Results of clinical samples showed about twice higher in EIA than in RIA in low value range. But in ranges of higher values EIA showed much higher values. Therefore quadratic relationship was obtained between EIA and RIA. The results of clinical samples well agreed each other between EIA and RIA.

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FUNDAMENTAL STUDY OF ENZYME IMMUNOASSAY OF  $\alpha$ -FETOPROTEIN AND ITS CLINICAL APPLICATION. Y.Tanggo, S.Fujiyama and T.Sato. Third Department of Internal Medicine, Kumamoto University Medical school. Kumamoto

In order to evaluate the advantage and usefulness of an enzyme immunoassay of  $\alpha$ -fetoprotein (AFP) was studied using immunoball AFP kit (Toyobo). Mean coefficient of variation of intraassay, interassay and recovery rate were 5.5%, 11.2% and 107.9% respectively. There was a good correlation between the estimated values by EIA and RIA with coeff. of correlation of 0.945. Serum AFP were measured by this EIA. Normal value of AFP was less than 20 ng/ml. About 78% of patients with hepatocellular carcinoma (HCC) showed AFP levels over 500 ng/ml, 21.6% under 500 ng/ml and only one case (2.7%) was in normal range. Approximately 50% of both chronic active hepatitis and liver cirrhosis had elevated AFP levels ranging from 20 to 500 ng/ml and only few cases of these diseases showed over 500 ng/ml. AFP values over 1000 ng/ml were found in HCC alone indicating that the value of AFP over 1000 ng/ml was diagnostic for HCC. It was also found that simultaneous determination of AFP and carcinoembryonic antigen could differentiate HCC from metastatic liver cancer. From these studies we concluded that the EIA method was a useful tool in routine laboratory work because of no requirement of radioisotope.