Progress in nucleomedical utilization of monoclonal antibody

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CLINICAL APPLICATION OF CA125 IN GYNECOLOGY. T.Kato.Kurume University, Fukuoka.

Clinical testing for the presence of CA125, performed jointly by eight universities across Japan, revealed that by setting the CA125 cut off value at 65 μ/ml, a 75% positive detection rate is obtained in ovarian cancer and a 5.5% rate in benign tumors, that is, an extremely high positive rate for malignant neoplasms. Other CA125-positive diseases are discussed from a histoembryological viewpoint.

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ANALYSIS OF ADENOCARCINOMA-ASSOCIATED ANTIGEN ASSESSED BY A MONOCLONAL ANTIBODY AND ITS CLINICAL APPLICATION. K.Imai and A.Yachi. Department of Internal Medicine (Section 1), Sapporo Medical College, Sapporo.

A hybridoma derived from murine myeloma cells fused with splenocytes of mice,which were immunized with lung adenocarcinoma line A549, secreted monoclonal antibody YH206 (IgM) that reacted with the antigenic determinant preferentially expressed on human adenocarcinoma. Western blotting experiment revealed that the monoclonal antibody YH206 reacted with the single polypeptide of more than 330K dalton. Immunohistological studies demonstrated that this monoclonal antibody strongly reacted with adenocarcinomas and bronchoalveolar cell carcinomas of the lung. Although it reacted with fetal lung, it did not stain the normal lung tissue. Reverse passive hemmagglutination test employing purified antibody YH206 revealed that this antibody could successfully detect the circulating antigen in the sera of patients with lung cancer at higher incidence (35/67, 52.2%) than in the sera of healthy controls (3/30, 10.0%). ELISA was then developed employing biotinylated antibody YH206 in conjunction with avidin-peroxidase. Circulating YH206 antigen might be useful for serodiagnosis of adenocarcinomas.

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APPLICATIONS OF ANTI-CARDIAC MYOSIN MONOCLONAL ANTIBODIES TO THE DIAGNOSIS OF ACUTE MYOCARDIAL INFARCTION. Y.Yazaki, K.Yamaoki, M.Isobe, F.Takaku, J.Nishikawa, M.Iio. University of Tokyo, Tokyo.

We have developed anticardiac myosin antibodies, especially monoclonal antibodies for use in the diagnosis of acute myocardial infarction. Our investigations are divided into two research projects.

1) To visualize and quantify the size of myocardial infarction (MI), we used monoclonal antibody (HMC48) specific for cardiac myosin heavy chain. HMC48 Fab fragment was labeled with indium(In)-111, via a bifuncional chelating agent. MI was produced in 12 dogs by ligation of either left anterior descending or circumflex coronary artery. Single-photon emission computed tomography (SPECT) was performed with In-111 HMC48 Fab (0.1 mCi/kg intravenously 8 hrs before imaging) at 24hrs, 7 and 14 days after coronary ligation. Infarct size (P-MI) determined at postmortem (14 days after ligation) was compared with the size of hot spot of In-111 (In-MI) and cold spot of thallium(Tl)-201 (Tl-MI). In-111 HMC48 was clearly visualized corresponding to the cold spot of Tl-201 throughout two weeks after MI, whereas uptake of technecium-99m pyrophosphate was scarcely visible 6 days after ligation. At 24 hrs, In-MI correlated well with P-MI (r=0.82), whereas Tl-MI was significantly larger than P- and In-MI. On the 14th day, Tl-MI was smaller than P- and In-MI. SPECT with labeled HMC48 Fab was useful for quantitative estimation of the infarct size as long as two weeks.

2) We have reported that serum cardiac myosin light chain 1 (LC1) analysis by radioimmunoassay (RIA) could provide an accurate method for sizing myocardial infarction (MI). Recently, an immunoradiometric assay (IRMA) has been applied for the determination of protein concentrations with reference to its specificity, short reaction time and large scaled productivity with relative ease. Thus, we have developed a sensitive IRMA of serum LC1 using two types of monoclonal antibodies (MLM508, MLM544) specific for LC1. In this assay, 100 μl of serum was added with 50 μl of I-125-labeled MLM544 to tubes coated with MLM508 and incubated for 4 hours. Amount of bound LC1 in the serum was quantitated by counting the tubes after washing, and 0.1ng of serum LC1 could be measured. We deteremined serially serum LC1 by this IRMA in 75 patients (pts) with acute MI admitted within 12 hours of chest pain. A good correlation was observed between serum LC1 concentrations determined by IRMA and RIA (r=0.98). Again, we observed that peak LC1 correlated with left ventricular ejection fraction (r=0.82) and the extent of asynergic area (r=0.85). Thus, an IRMA of serum LC1 can provide a clinical useful and accurate method for MI sizing.