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SUPER-JUMBO DIGITAL GAMMA CAMERA GCA-90A.
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This new type of gamma camera has a square detector with a large field of view and employs the data processing function as the basic composition. It is an effective, total nuclear medicine diagnostic system capable of performing from acquisition to processing on ordinary imaging, whole body imaging and single photon ECT imaging.
The detector is a square type with a large effective field of view (35cmx50cm), and a CEL mechanism for correcting the energy level and linearity in real time. The unit has the basic performance of uniformity (integrated value) of ±5%, linearity (absolute value) of 1.0mm, intrinsic resolution of FWHM 4.8mm (99mTc), and maximum counting rate of 200kcps (40%), as measured with CFOV by the measuring method according to NEMA.
Unlike the conventional system consisting of a gamma camera and data processer, with this gamma camera setting of energy conditions by spectrum display, setting of data aquisition conditions, image display during and after data aquisition, and processing after data aquisition can all be performed by observing the monitor of the operator console. Conditions frequently used can be set as a protocol, thereby facilitating operations.

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CLINICAL EVALUATION OF Tc-99m(Sn)-N-PYRIDOXYL 5-METHYLTRYPTOPHAN (^{99m}Tc-PMT).
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Chemical and biologic study revealed that ^{99m}Tc-PMT has excellent properties as a hepatobiliary imaging agent; a) rapid blood clearance, b) fast hepatobiliary transit, c) no intestinal reabsorption, d) low urinary excretion, e) stout resistance to serum bilirubin and f) low toxicity.

Its clinical studies are now in progress and the data published at present indicate that ^{99m}Tc-PMT is a promising hepatobiliary agent, and are summarized as follows: 1) excellent hepatobiliary image can be obtained because of its extremely low urinary excretion ratio (2 - 3% in normal), high hepatic uptake ratio and rapid blood clearance. 2) time needed for a study is shorter than former products. 3) successful imaging of hepatobiliary system is possible even in high serum bilirubin patients who cannot be studied with other agents, which means expansion of the clinical application. 4) no adverse reaction has been reported and it confirms safety of the study.

The radiation dose estimated by the MIRD technique based on human metabolic data will also be discussed.

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CLINICAL EVALUATION OF I-123 ORTHOIODO HIPPURATE (OIH).
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I-123 OIH is expected to be an ideal reagent for the evaluation of both renal morphology and function.

Because of its suitable physical characteristics (T1/2: 13 hr, γ ray energy: 159 KeV, no β^- ray), superior image can be obtained using scintillation camera compared with I-131 OIH, with less radiation dose to the patient. In addition, combining with computer, it is possible to calculate various parameters easily, and also to evaluate the regional renal function by regional renogram (cortex and pelvis) and functional image (T max, T1/2).

No adverse reaction was reported in 383 patients who were injected I-123 OIH.

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2-SITE IMMUNORADIOMETRIC ASSAY (SANDWICH RIA) OF AFP WITH MONOCLONAL ANTIBODY.
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The measurement of serum AFP has been widely used for the differential diagnosis of primary hepatocelluler carcinoma (HCC) and the monitoring the cancer.
We have developed a simplified sandwich RIA using two different kinds of monoclonal antibodies. One monoclonal antibody to AFP was coated onto the plastic bead and another was used as ^{125}I labeled tracer. The excellent specificity and reactivity with the use of two monoclonal antibodies reduced the problems of batch to batch variation associated with conventional antisera. The advantages of this method were the elimination of centrifugation step for B/F separation, and the only 20 ul of specimen was needed for the assay. The measurable range was from 3 ng/ml to 700 ng/ml. Coefficients of variation for within-assay and between-assay on three control serum pools were 3.9-5.8 % and 2.3-5.3 %, respectively. In the recovery study using 100 specimen, approximately 103 % of AFP was found to be recovered. The assay can be done either at room temperature for overnight with standing or for 3 hours with shaking.
These results indicate that the sandwich method with use of monoclonal antibodies we have developed can be used for routine clinical applications.