Symposium II

Recent Advance and Problem in Nuclear Medicine-Imaging Efficacy-

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QUANTITATIVE EVALUATION OF DIAGNOSTIC EFFT-CACY FOR MEDICAL IMAGE INTERPRE TATION. T.A. Iinuma. National Institute of Radiological Sciences. Anagawa, Chiba-shi.

Quality of the health care should be maintained in high standard and thus be measured quantitatively and periodically. The quality of health care may be evaluated by its efficacy and efficiency. Expert committee on efficacy of World Health Organization has defined four levels of medical efficacy which start from diagnostic efficacy to population health efficacy. In this presentation, the diagnostic efficacy of medical image interpretation is defined and example of its measurement is presented. Diagnostic efficacy of the image is quantitatively measured by rate of correct diagnosis which are classified into sensitivity (true positive rate) and specificity Measurements of (true negative rate). sensitivity and specificity are not easy, since they needs large amount of confirmed cases as a gold standard. We have completed a retrospective study of diagnostic efficacy for liver image and T1-201 myocardial image interpretation. The methodology of the study was described in detail with a special emphasis on the operating characteristic (ROC) andlysis.

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EFFICACY OF THE IMAGING THE THYROID IMAGING MAKOTO MIYAKAWA, Shinshu University School of Medicine, Matsumoto,

In our study I used Hg-197 chloride, Tl-201 chloride and Ga-67 citrate in thyroid scintigraphy and compared these agents. These joints use of thyroid scintigraphy resulted in a qualitative diagnosis of thyroid tumor.

Summary:

- 1) I concluded that T1-201 chloride has no specific affinity for malignant thyroid tumors and can not be used to discriminate between carcinoma and adenoma, but that surgery should be indicated for nodules which show positive figures by Tl-201 chloride scintigraphy.
- 2) I could get the histological diagnosis of thyroid tumor using thyroid scintigraphy with these radioisotopes.

The results are as shown in this table.

197HgCl	101Tl-chloride	"Ga-citrate
+	+	-
+	-	+
+	+	-
+	+	+
±	-	-
±	+	-
±	+	-
-	+	-
	# HgCl ₁ + + + + + + + + + + + + + + + + + + +	##IIgCl ₁ ##TI-chloride +

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AN EVALUATION OF DIAGNOSTIC EFFICACY OF CARDIOVASCULAR NUCLEAR MEDICINE FOR DETE-CTION OF MYOCARDIAL INFARCTION. H. Murata and H. Tabuchi. Tokyo Metropolitan Geriatric Hospital, Tokyo.

The purpose of the present study was to evaluate the diagnostic efficacy of the images obtained by nuclear cardiology for detection of the lesions in the patients with myocardial infarction. In the present study two types of studies were performed. The first study was a clinical one in which direct left ventriculogram(LVG) & coronary arteriogram(CAG) was employed as a gold standard. The other was a study with autopsy cases.

1. Clinical study. Thirty cases with transmural infarction proved the infarcted lesions by LVG & CAG, and 4 cases without abnormal finding on LVG & CAG were studied. The images evaluated in the present study were regional wall motion display obtained by ECG gated radionuclide cardiography(gate method), functional color image by phase analysis, and planar image of Thallium(Tl) myocardial scan. Tl scan was judged by visual interpretation and circumferential profile analysis. The image by each modality was independently analyzed by two observers without the information of LVG & CAG. The results represented the consensus of these two observers. For evaluation of efficacy of regional wall motion display by gate method, regional wall motion of each segment from 1 to 7 was

compared with that of LVG. In 238 segments of 34 cases, sensitivity, specificity and accuracy for regional wall motion abnormality were 74, 94 and 86%, respectively. The functional image of phase analysis was also compared with LVG. Five regions such as anterior, lateral, septal, inferior and posterior region were analyzed in each case. In 170 regions of 34 cases, sensitivity, specificity and accuracy were 67, 89 and 79%, respectively. On comparison of Tl scan of 170 region in 34 cases, sensivity, specificity and accuracy of visual interpretation were 67, 86 and 77%. On the other hand, sensitivity, specificity and accuracy of circumferential analysis were 45, 86 and 68 %, and the sensitivity of this method was considerably lower than that of visual interpretation.

2. Autopsy study. Tl scan findings of 6 cases with transmural infarction, 4 cases with nontransmural infarction and 10 cases without infarction were compared with autopsy findings. Five regions of anterior, lateral, septal, inferior and posterior portion were analyzed in each case. Overall sensitivity, specificity and accuracy for detection of of infarcted lesion were 61, 98 and 88%, respectively. In 30 regions only in 6 cases with transmural infarction, however, sensitivity, spe-sificity and accuracy were 94, 92 and 93%, whereas none was detected in 11 infarcted lesions of 4 cases with nontransmural infarction.