Assessment of Microcirculation Disturbance in Patients with Coronary Ectasia by ATP-Loading 99mTc-Tetrofosmin Myocardial SPECT

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Patients with coronary ectasia often develop chest pain and reveal ischemic changes on electrocardiograms and reduced left ventricular wall motion on left ventriculography, in the absence of epicardial coronary artery stenotic regions. We examined the disturbances in the coronary microcirculation in patients with coronary ectasia using left ventriculography and ATP loading 99mTc-tetrofosmin myocardial single photon emission computed tomography (SPECT) before and after administration of a coronary vasodilator and antiplatelet agents. [Methods] Twenty patients in whom coronary angiography revealed diffuse coronary artery ectasia but no stenotic regions were enrolled in this study. Left ventriculography and ATP loading 99mTc-tetrofosmin myocardial SPECT were performed before and after administration of the coronary vasodilator, nicorandil, as well as that of the antiplatelet agents, aspirin and ticlopidine. [Results] 1) The ejection fraction in left ventriculography was 48.3 ± 17.4% before, and 56.6 ± 18.3% after the drug administration, the ejection fraction was improved after the drug administration (p < 0.05). 2) Before the drug administration, the total defect scores on 99mTc-tetrofosmin myocardial SPECT were 5.9 ± 3.1 and 8.8 ± 2.7 in the ATP-loading and rest images, respectively (p < 0.05), and the corresponding scores after the drug administration were 4.1 ± 3.0 and 5.4 ± 3.1, respectively (N.S.). Thus, the total defect scores in the ATP-loading and rest images improved after the drug administration (p < 0.05). [Conclusion] Myocardial damage in patients with coronary ectasia might be induced by microthrombotic embolism and microcirculation disturbance.

Key words: coronary ectasia, microcirculation, 99mTc-tetrofosmin

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Cost-Utility Analysis of Antithyroid Drug Therapy versus 131I Therapy for Graves’ Disease

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There is no comparative cost-utility study between 131I therapy and antithyroid drugs (ATD) therapy for Graves’ disease, though 131I therapy has higher remission rate and less side effects. The objective of the study was to analyze the cost-utility of ATD therapy versus 131I therapy by calculating life-long medical costs and utility, based on the responses of Graves’ disease patients to questionnaires. To determine the expected cost and expected utility, a decision tree analysis was designed on the basis of the 2 competing strategies of ATD therapy versus 131I therapy. A simulation of 1,000 female patients weighing ≥50 kg who assumed to experience the onset of Graves’ disease at the age of 30, to first complain of thyrotoxic symptoms and moderate goiter 2–3 mo. previously, and to undergo a 40-years-long cohort study, was created for each strategy using a decision tree and baselines of other relevant variables. The variables and costs were based on the literature and hospital bills. The maximum and minimum values of utility were defined as 1.0 and 0.0, respectively. Future costs and utilities were discounted 5%. The medical costs and utilities were 85,739–88,650 yen/patient/40 years and 16.47–16.56/patient/40 years, respectively, for the ATD therapy strategy, and 81,842 yen/patient/40 years and 17.41/patient/40 years, respectively, for the 131I therapy strategy. These results quantitatively demonstrated that the 131I therapy strategy was superior to the ATD therapy strategy in terms of both cost and utility. 131I therapy should be used more widely

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in Japan because of its greater utility and lower cost.

Key words: Graves' disease, radioiodine therapy, antithyroid drug, cost-benefit analysis

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The Feasibility of Long-Term Outcome Prediction in Acute Myocardial Infarction
Using the Discordance between Early and Delayed Image
on 123I-BMIPP Myocardial Scintigraphy

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Objectives: The feasibility of long-term outcome prediction using BMIPP myocardial scintigraphy was evaluated in cases of acute myocardial infarction. Methods: BMIPP myocardial scintigraphy was performed on 165 patients with first acute myocardial infarction at the time of discharge from the hospital (average of 27 days after disease onset). Discordance between early and delayed image was checked and its relation to later cardiac events (during the mean follow up period of 64.2 ± 9.8 months) was analyzed. In 82 of these 165 cases TICI scintigraphy was simultaneously performed (TI/BMIPP dual SPECT) to examine mismatch form BMIPP scintigraphy and discordance between early and images. Results: Discordance between early and delayed images was observed in 86 cases (52%). Among patients for whom dual SPECT was performed, mismatch between TICI and BMIPP scintigraphy was observed in 30 cases (37%). When the relation between mismatch and discordance was analyzed, mismatch was accompanied by washout. The incidence of later cardiac events was significantly higher for cases showing discordance accompanied by washout and cases showing mismatch on dual SPECT scintigraphy than cases without these findings. When multivariate analysis was conducted, involving age, sex, infarction related artery, left ventricular end-diastolic volume index, left ventricular ejection fraction, severity of disturbed fatty acid metabolism, washout and fill-in, washout was identified as an independent predictor of cardiac events. Conclusion: Mismatch on TI/BMIPP dual SPECT is important for predicting long-term prognosis of acute myocardial infarction. Furthermore, washout on BMIPP scintigraphy is also useful as a predictor of cardiac events.

Key words: acute myocardial infarction, BMIPP, mismatch, prognosis, SPECT


Analysis of Brain Images in Patients with Spinocerebellar Degeneration;
Using Statistical Parametric Mapping (SPM)
and Easy Z Score Imaging System (eZIS)

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In order to investigate the cerebral blood flow objectively, the easy Z score imaging system (eZIS), was developed, and has been applied in clinical practice. SPECT with 99mTc-ethyl cysteinate dimer (99mTc-ECD) was performed, and the images were analyzed using the SPM97 and the eZIS Ver. 2 to investigate cerebral blood flow in patients with two types of spinocerebellar degeneration.

We compared the distribution of cerebral blood flow between 13 patients with cortical cerebellar atrophy (CCA) and 26 patients with olivopontocerebellar atrophy (OPCA). In the both groups, cerebellar blood flow was decreased generally. In our evaluation using the eZIS Z score, the scores for the brain stem and cerebellar nucleus in the OPCA group were lower than those in the CCA group.

This method facilitates the objective evaluation of cerebral blood flow in patients with spinocerebellar degeneration, and may be useful for analyzing the condition of these disease.

Key words: easy Z score imaging system, regional cerebral blood flow, SPECT, SPM 97, spinocerebellar degeneration

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Radioiodine Treatment in Patients with Graves' Disease at Outpatient Clinic: Special Reference to Safety and Short-Term Outcome

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[Purpose] This retrospective study was aimed at revealing the safety and short-term outcome of radioiodine treatment in patients with Graves' disease at outpatient clinic. [Methods] From July 1999 to April 2002, 511 patients with Graves' disease were treated with radioiodine at the outpatient clinic of Tajiri Thyroid Clinic, Kumamoto. Of them, 73 patients dropped out or were referred to another medical institution. In the remaining 438 patients (100 men and 338 women; 44.6 ± 15.4 (mean ± SD) (14–82) years old), the safety of radioiodine treatment at the outpatient clinic and the treatment outcome until April 2003 was examined. The dosage was determined based on radioactive iodine uptake (3 hours) and thyroid volume measured by ultrasound. The initial dosage was 6.7 ± 3.3 (1.2–13.5) mCi. Five months later, it was evaluated whether or not radioiodine should be administered a second time. All patients were treated at the outpatient clinic. [Results] There was no particular problem associated with treatment. Patients with a large goiter could be successfully treated with divided doses. After 12–45 (30.1 ± 9.3) months of radioiodine, thyroid function status was as follows; hyperthyroidism: 7 patients (1.6%), subclinical hyperthyroidism: 78 patients (17.8%), euthyroidism: 108 patients (24.7%), subclinical hypothyroidism: 116 patients (26.5%), hypothyroidism: 129 patients (29.4%). [Conclusion] It was concluded that radioiodine treatment in patients with Graves' disease at outpatient clinic was safe and showed a satisfactory short-term outcome.

Key words: Graves' disease, hyperthyroidism, radioiodine, outpatient clinic

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