

## **$^{123}\text{I}$ -MIBG myocardial scintigraphy in diabetic patients: Relationship with $^{201}\text{Tl}$ uptake and cardiac autonomic function**

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**Purpose:** To investigate the influence of diabetic myocardial damage (suspected myocardial damage; SMD) diagnosed by  $^{201}\text{Tl}$ -SPECT and diabetic cardiac autonomic neuropathy (AN) on myocardial MIBG uptake in patients with non-insulin-dependent diabetes mellitus (NIDDM).

**Subjects and Methods:** Eighty-seven diabetic patients divided into four subgroups: 23 with SMD (+) AN (+); 19 with SMD (+) AN (-); 27 with SMD (-) AN (+); 18 with SMD (-) AN (-), and 10 controls were studied. Both planar and SPECT images were taken at 30 minutes (early) and 3 hours (delayed) after  $^{123}\text{I}$ -MIBG injection. The heart to mediastinum uptake ratio (H/M) and washout ratio of  $^{123}\text{I}$ -MIBG (WR) were obtained from both planar images. On SPECT images, the total uptake score (TUS) was obtained by the 5 point score method by dividing the myocardium into 20 segments on visual analysis. Similarly, the difference between the  $^{201}\text{Tl}$  image and the  $^{123}\text{I}$ -MIBG image in TUS was taken as the difference in the total uptake score ( $\Delta\text{TUS}$ ) representing cardiac sympathetic denervation without SMD.

**Results:** On both early and delayed planar images, the mean H/M value in the subgroups of diabetic patients was significantly lower in the SMD (+) AN (+) group than in the control group, but among those subgroups, there was statistically significant difference between the SMD (+) AN (+) and SMD (-) AN (-) groups only on the delayed images. Regarding the WR value, there was no statistically significant difference among subjects. On SPECT image analysis, the diabetic subgroup with AN or SMD had statistically significant lower values for TUS than those of the control group. Among diabetics, there was a statistically significant differences between SMD [+] AN [+] and SMD [-] AN [-] on both early and delayed images. Similarly, the SMD [+] AN [-] group also had significantly lower values than those of SMD [-] AN [-] on early images. Regarding  $\Delta\text{TUS}$ , there was a statistically significant differences between AN [+] subgroups and controls. Similarly, the mean value for  $\Delta\text{TUS}$  was much higher in AN [+] subgroups than in AN [-] subgroups with or without SMD in diabetes mellitus.

**Conclusion:**  $^{123}\text{I}$ -MIBG myocardial uptake is affected by both SMD and cardiac autonomic neuropathy. Based on the finding that  $\Delta\text{TUS}$  was much higher in AN [+] subgroups and there was no statistically significant difference between SMD [+] AN [+] and SMD [-] AN [+] subgroups, a decrease in myocardial  $^{123}\text{I}$ -MIBG uptake might progress independently of SMD.

**Key words:**  $^{123}\text{I}$ -MIBG myocardial scintigraphy, NIDDM, diabetic myocardial damage, cardiac autonomic neuropathy