

Serial change in ^{123}I -MIBG myocardial scintigraphy in non-insulin-dependent diabetes mellitus

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Purpose: We performed ^{123}I -MIBG (MIBG) myocardial scintigraphy twice in patients with non-insulin-dependent diabetes mellitus (NIDDM) to investigate whether MIBG distribution was improved by pertinent clinical control. To determine the influential factors for MIBG distribution, we investigated the association between various clinical parameters and the serial change in MIBG uptake parameters. **Patients and Methods:** Twenty NIDDM patients with no cardiac disorders were evaluated. Planar images were taken at 30 minutes (early) and 3 hours (delayed) after MIBG injection. The heart-to-upper-mediastinum uptake ratio (H/M) and washout ratio (WR) were calculated as parameters for estimating cardiac sympathetic function. Patients were divided into two groups, eight in the improved group and twelve in the unimproved group, according to the serial change in H/M. The mean interval between the baseline and the follow up study was 2.1 ± 0.6 year. Differences between the means of the laboratory data in patients in both groups were compared for the baseline and the follow up study by using the paired t-test. As a means of determining the influential factors for a serial change of MIBG uptake, Fisher's exact test was performed to evaluate the association between the serial change in cardiac MIBG parameters and changes in other clinical parameters, such as blood sugar (BS) control, BS control method (insulin therapy), serum cholesterol control, and severity of diabetic complications. We also analyzed the association between the changes in $\text{CV}_{\text{R-R}}$ (coefficient variance of R-R intervals at rest ECG) or NCV (velocity of posterior tibial nerve) and those of other clinical parameters. Associations among these neurological parameters (MIBG parameters, $\text{CV}_{\text{R-R}}$ and NCV) were also analyzed. **Results:** Paired t-tests showed a significant decrease in fasting blood sugar and fructosamine in the improved group in the follow up study compared to those in the baseline study. Nevertheless, Fisher's exact test showed no significant association between FBS, $\text{HbA}_{1\text{C}}$, fructosamine and the improvement in cardiac MIBG uptake. The only significant association was observed between the serial change in H/M and the BS-control method (insulin therapy). Within the neurological parameters, a significant association was noted between the serial changes in H/M and $\text{CV}_{\text{R-R}}$. **Conclusion:** Although BS control was likely to be an important factor, it did not always ameliorate cardiac MIBG uptake. Based on the significant association between the BS-control method (insulin therapy) and MIBG uptake change, the severity of diabetes mellitus was likely to be a more influential factor. It was suggested that cardiac MIBG uptake could improve within the mild stage if controlled by diet therapy or an oral hypoglycemic agent in NIDDM.

Key words: follow-up ^{123}I -MIBG myocardial scintigraphy, NIDDM, serial change