Abstract : The degree of ST-segment elevation and amplitude of J waves, which may change in patients with the Brugada-type electrocardiogram (ECG) over time, are influenced by autonomic nervous activity and the administration of antiarrhythmic drugs. In the present study, we evaluated whether the shape of ST-segment elevation in patients with a Brugada-type ECG might alter the parameters of an 123I-MIBG myocardial scintigraphy and body surface signal-averaged ECG (SAECG). The subjects consisted of 12 patients with a Brugada-type ECG and 15 healthy volunteers (N group). The patients with a Brugada-type ECG were classified into the following 2 groups based on the type of ST-segment elevation: 6 patients with the coved type ST-segment elevation (C group), and 6 patients with the saddle-back type ST-segment elevation (S group). Planar and SPECT images were obtained 15 minutes (early images) and 3 hours (delayed images) after the administration of 123I-MIBG, respectively. In addition, the washout rate (%WR) of 123I-MIBG was obtained in a bull’s eye map of the SPECT image. There were no significant differences in the early H/M ratio between the C and S groups. In the C group, however, there were some patients who showed a decreased accumulation or defect of 123I-MIBG in the planar and SPECT images. Furthermore, in contrast to the N and S groups, the C group showed a decreased delayed H/M ratio and increased %WR. SAECG did not show any significant differences between the S and C groups. These results of the present study suggest that the shape of ST-segment elevation may be associated with myocardial autonomic nervous function. In addition, the electric heterogeneity of the action potential in the right ventricular epicardial myocardium, which is frequently influenced by autonomic nervous activity, is closely associated with the development of Brugada syndrome. J. Med. Invest. 53 : 95-102, February, 2006

Keywords : Brugada syndrome, ST-segment, 123I-MIBG myocardial scintigraphy, SAECG
1) Subjects

2) MIBG myocardial scintigraphy
3) Body surface signal-averaged electrocardiography (SAECG)

3) Body surface signal-averaged electrocardiography (SAECG)

4) Statistical analysis

4) Statistical analysis

1) Planar images of 123I-MIBG myocardial scintigraphy in healthy volunteers and patients with Brugada-type ECG

1) Planar images of 123I-MIBG myocardial scintigraphy in healthy volunteers and patients with Brugada-type ECG

2) SPECT images of 123I-MIBG myocardial scintigraphy in healthy subjects and patients with the Brugada-type ECG

2) SPECT images of 123I-MIBG myocardial scintigraphy in healthy subjects and patients with the Brugada-type ECG
3) Delayed H/M ratios and %WR among N, S, and C groups

![Standard ECG](image1)

![SPECT images](image2)

**C) Bull’s eye images**

<table>
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![SPECT images](image3)

**C) Bull’s eye images**

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T. Kawaguchi, et al. MIBG in Brugada-type ECG
1) Relationship between autonomic nervous activity and the Brugada-type ECG

![Graphs showing delayed H/M and washout ratio]

![Graphs showing f-QRS, RMS40, and LAS40 measurements]
2) Relationship between the Brugada-type ECG and SAECG

2.1. Comparison with other ECGs

Various studies have reported the presence of a similar ECG pattern in patients with Brugada syndrome. The typical Brugada-type ECG features include a ST-segment elevation in the right precordial leads (V1-V3), and a negative T-wave in the same leads. These findings are associated with an increased risk of sudden cardiac death. In contrast, the SAECG (Sustained Automatic ECG) is a technique that measures the spontaneous atrial activity and has been used to identify patients at risk for atrial fibrillation. MIBG (Meta-iodobenzylguanidine) imaging has also been used to assess the sympathetic nervous system, which is often abnormal in patients with Brugada syndrome.

2.2. MIBG in Brugada-type ECG

The use of MIBG imaging in patients with Brugada-type ECG has been reported to identify patients with underlying cardiac autonomic dysfunction. This technique involves the administration of a radioactive tracer that accumulates in the sympathetic nerve terminals and can be used to assess the integrity of the sympathetic nervous system. MIBG imaging has been shown to be a useful tool in the diagnosis and management of patients with Brugada syndrome, as it can provide information about the sympathetic nervous system function and help guide the appropriate treatment strategies.