Brugada Syndrome and Vasospastic Angina Do Coexist: Potential Clinical Importance

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Brugada syndrome (BS) is characterized by J wave and ST elevation in V1-V3 and sudden cardiac death (1). Since its first description in 1992, it has been established as a distinct clinical entity and it has been shown that sudden death is due to ventricular fibrillation caused by phase 2 reentry (2). BS can be easily diagnosed if patients show the characteristic ECG pattern but it is well known that the ECG can be modulated by several factors and sometimes it might appear totally normal and only be unmasked after various interventions (3). Syncope is the main symptom of BS. On the other hand, vasospastic angina (VSA) (4) is also associated with syncope and is a potentially fatal disease due to ischemia-induced ventricular fibrillation (5, 6).

Previous reports (7-12) as well as that of Sasaki et al in this journal (13) suggest that BS is associated with vasospastic angina (VSA) and when such a combination is the case, proper management is essential.

Coexistence of BS and VSA

Spontaneous attacks of VSA or induction of coronary spasms have been documented in BS (7-12). Noda et al (11) induced coronary spasms using acetylcholine in 3 (11%) of 27 patients with BS. Chinushi et al also attempted induction of coronary spasms and obtained positive results in 13% among 38 patients with BS (12). A spontaneous anginal attack was demonstrated in one patient and provocation of coronary spasms in the other in the report of Sasaki et al (13).

On the other hand, the prevalence of BS among VSA patients is not known. ECG showed an incomplete right bundle branch block (RBBB) in 4 and complete RBBB in 2 among 30 patients with VSA (7). These patients could be candidates for BS but pharmacological testing was not attempted for the induction of a typical ECG pattern of BS. A typical ECG pattern (coved type ST-elevation) was not observed in 43 successive patients with typical VSA in our institution (Sato A et al Preliminary data).

To date, the combination of the two diseases seems to occur more often than that which occurs as a result of coincidence. When BS and VSA coexist, there is a danger of inducing ventricular fibrillation due to BS or coronary spasms. The combination of these two potentially fatal diseases is clinically very important.

Clinical implications of co-existence of BS and VSA

Syncope is a major symptom of BS and some may be survivors of cardiac arrest (1, 7-12). Unless the patients show an ECG pattern suggestive of BS, the potentially fatal disease would go unnoticed. VSA is also associated with syncope or cardiac arrest (5, 6) and is almost definitely diagnosed by demonstrating ST-elevation during the attacks of chest pain or by demonstration of coronary spasm by use of a provocation test.

For the induction of coronary spasms, acetylcholine is the drug of choice (4) but acetylcholine reduces the inward calcium currents thereby inducing a loss of the epicardial dome of the action potential in BS (14). In the second case of Sasaki et al (13), syncope was the first symptom and it was treated with Nifedipine as VSA. A provocation test using acetylcholine resulted in coronary spasms and a typical ECG pattern for BS. Since ischemia opens the ATP-sensitive K-channel and results in the loss of the dome of the action potential, coronary spasms might unmask the ECG pattern of BS in addition to that due to reduced calcium currents (14).

See also p 77.

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There is another important problem: calcium channel blocker is the drug of choice in VSA but this drug can ag-
gravate the ECG pattern of BS. Experimentally, Verapamil, a calcium channel blocker, was shown to induce ST-elevation of the coved type and to lead to ventricular fibrillation in the model of BS (14). When BS and VSA coexist, a calcium channel blocker will be needed but for safety: implantation of an ICD would be mandatory.

In the first case of Sasaki et al (13), angina pectoris recurred and a calcium channel blocker was effective but death was due to the refusal of implantation of an ICD. In the second case, an ICD was implanted following assessment by electrophysiologic testing. Chinushi et al reported cases of the coexistence of BS and VSA in whom a calcium channel blocker was effective to control VSA without aggravating ECG or clinical symptoms of BS when they were treated with an ICD (12). In BS, however, failure of ICD therapy is to be avoided (15, 16).

In summary, clinical experience suggests that it is not rare that potentially fatal diseases: Brugada syndrome and vasospastic angina, coexist. Though the prevalence of such coexistence: especially BS among patients with VSA, has not been elucidated, a potential combination should be kept in mind since BS can be entirely concealed. An ICD is indicated not only for patients who have survived cardiac arrest but it can also be implanted for the primary prevention of BS (17).

References