Incidence and clinical characteristics of coronary artery spasm in patients with out-of-hospital cardiac arrest

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Background: Substantial cases of out-of-hospital cardiac arrest (OHCA) due to acute coronary syndrome have been recognized thus far, but there have been few reports about the etiology of patients with OHCA without the organic heart disease. Especially, coronary artery spasm would be one of the causes of OHCA.

Purpose: This study aimed to investigate causes of OHCA without the organic heart disease and to investigate the characteristics and angiographic findings of OHCA patients with vasospastic angina (VSA).

Methods: Between January 2010 and April 2018, 920 patients with OHCA caused by probable or definite cardiovascular disease were transferred to our hospital. Return of spontaneous contraction was successfully achieved in 151 patients, among whom diagnosis was made in 130 patients. First, we analysed the causes of OHCA in these patients. Second, we compared clinical and angiographic characteristics between the VSA group with OHCA (OHCA-VSA) and the VSA group without OHCA (stable VSA; n=72) from our database.

Results: Among the 130 patients, 95 (73%) had the organic heart disease; 72, acute coronary syndrome; 19, myocardial disease; 2, valvular heart disease; and 1, congenital heart disease. There were 35 patients (27%) without the organic heart disease. Nineteen patients had primary (i.e., Brugada syndrome, QT prolongation) or secondary arrhythmia (i.e. drug adverse effect). Electrocardiogram, coronary angiogram, and LV structure and function were normal in 35 patients. However, there were 16 patients (11%) with VSA defined by Japanese guideline. The OHCA-VSA group was significantly younger (50±14) than the stable VSA group (64±11, P=0.003). The incidence of diffuse-type spasm in the OHCA-VSA group (100%) was significantly higher than that in the stable VSA group (100% vs. 69%, P<0.05). In addition, the incidence of triple-vessel coronary spasm in the OHCA-VSA group was significantly higher than that in the stable VSA group (86% vs. 25%, P=0.003).

Conclusion: OHCA patients without the organic heart disease had considerable cases of VSA, in addition to primary or secondary arrhythmia. Furthermore, the severity of spasm in the OHCA-VSA group was more serious and extensive than in comparison with the stable VSA group.