

Acute drop in ambient temperature deteriorates coronary microcirculation and increases future cardiovascular events in patients with ST-segment elevation myocardial infarction

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[Purpose] Cold exposure might increase the incidence of acute myocardial infarction. However, the prognosis of patients who experienced temperature fall before the onset of ST-segment elevation myocardial infarction (STEMI) remains unclear.

[Methods] We performed primary percutaneous coronary intervention for 383 consecutive patients with STEMI. Acute drop (AD) in ambient temperature was defined as the reduction over the average difference between the highest and lowest temperature of the month. We obtained meteorological data from the Japan Meteorological Agency database. We analyzed data on coronary microcirculation and major adverse cardiac events (MACE).

[Results] Of these patients, 286 patients (74.7%) experienced AD for the three days before STEMI. In patients who experienced AD, coronary microcirculation tended to be impaired. Moreover, experience of AD remained an independent significant predictor of MACE on multivariate Cox proportional hazard analysis (hazard ratio, 2.47; 95% confidence interval: 1.11-5.51, $p = 0.03$).

[Conclusion] Patients with STEMI triggered by AD experienced a poorer prognosis. AD before STEMI may damage microvascular function and lead to the worse clinical outcomes.

Table. Various Aspects of Coronary Microcirculation

	AD group (n=286)	non-AD group (n=97)	P value
Post-procedure TIMI 3 flow, n (%)	241 (84.3)	89 (91.8)	0.06
Corrected TIMI frame count after PCI	29.1 ± 16.1	25.3 ± 13.4	0.07
ST-segment resolution ≥ 50% after PCI, n (%)	176 (61.5)	70 (72.2)	0.06