Osborn Wave in Accidental Hypothermia

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A 75-year-old woman was found unconscious on a snowy road and was admitted to the emergency room. On admission, her rectal temperature was 27°C and blood pressure was below 80mmHg. Twelve-lead ECG showed Osborn wave (J wave) and atrial fibrillation: a typical ECG of hypothermia (Fig. 1A). After re-warming, she recovered without any complications and her ECG returned to normal (Fig. 1B).

Osborn wave, now often called J wave, has been described experimentally (1) and clinically (2) in association with hypothermia and the amplitude of the J wave was inversely correlated with body temperature. Sinus bradycardia, prolonged PR and QT intervals or atrial fibrillation would be found in more profound hypothermia but all of these ECG abnormalities would normalize on re-warming as shown in Fig. 1B (3).

J wave is due to a notch found between phase 1 and 2 of the action potential as a result of transient outward currents. The gene of Ito is known to be expressed most abundantly in the epicardial myocardium (4). J wave might be now well known as one of the characteristic ECG signs of Brugada syndrome (5) but, proper diagnosis and management are mandatory in hypothermic patients.

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