

Osborn waves (J waves) in an elderly patient from accidental hypothermia

Prabin Phuyal[^], Nabil Ghani

Department of Internal Medicine, Saint Peter's University Hospital/Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ, USA

Correspondence to: Prabin Phuyal, MD. Department of Internal Medicine, Saint Peter's University Hospital/Rutgers Robert Wood Johnson Medical School, 1050 George Street, Apt 1-O, New Brunswick, NJ 08901, USA. Email: drprabinpkis@gmail.com.

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A 70-year-old man was brought to the emergency department by the Emergency Medical Services (EMS) in altered mental status. The patient had medical history significant for prediabetes, benign prostatic hyperplasia, and quadriplegia from remote history of motor vehicle accident. The patient was becoming more confused for which EMS was called by the family. When EMS arrived, the patient was found sitting in front of an open window without any clothes on and the weather was cold because it was wintertime. On arrival, he was disoriented, with a body temperature of 86.1 °F, heart rate at 52 beats/minute, blood pressure 91/51 mmHg,

respiratory rate at 11 breaths/minute, hemoglobin 11.7 g/dL, and platelets of 97,000/mm³. Serum electrolytes, troponin, and computed tomography (CT) of the head were within normal limits. Urine toxicology was negative. The 12-lead electrocardiogram (ECG) on admission revealed marked sinus bradycardia (45 beats/minute) with a first-degree atrioventricular block (PR interval =0.29 seconds) and an elevation of J point, also known as “Osborn waves”, which were more prominent in the inferior (II, III, aVF) and the lateral precordial leads (V4 through V6) as seen in *Figure 1*. The diagnosis of moderate hypothermia was made,

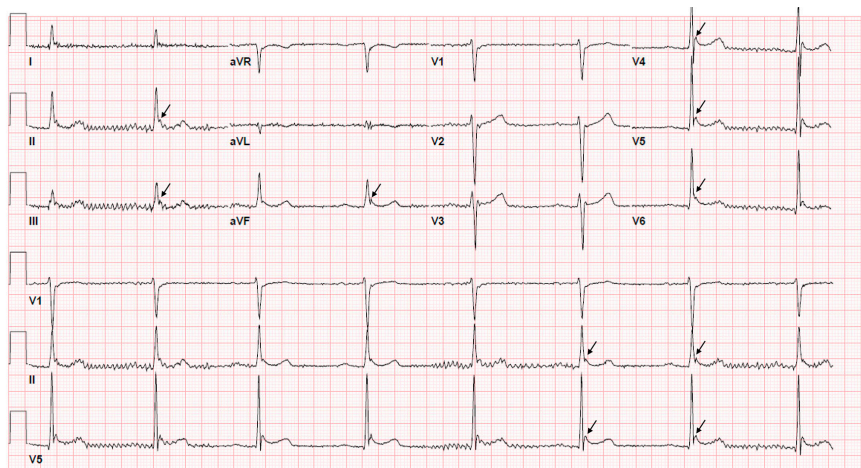


Figure 1 Positive deflections or Osborn waves (arrows) in the inferior and lateral leads.

[^] ORCID: 0000-0001-9785-9644.

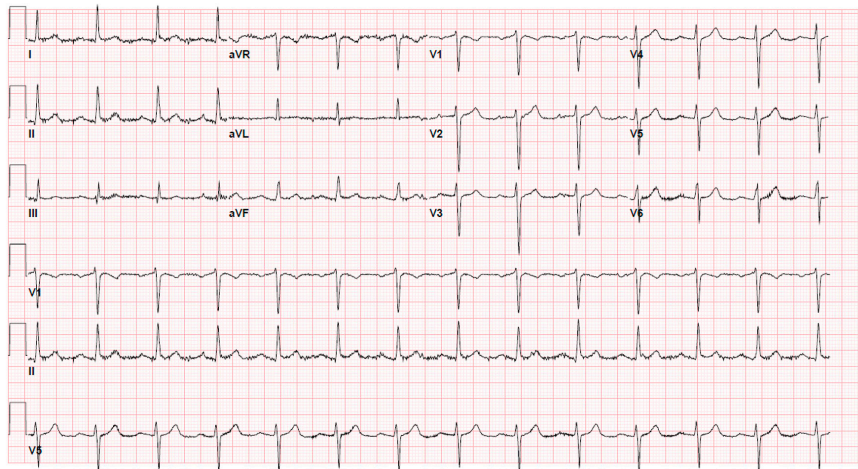


Figure 2 Disappearance of Osborn waves as previously seen in *Figure 1* and appearance of normal sinus rhythm.

and active external and internal rewarming was started. Following rewarming, ECG revealed the disappearance of Osborn waves (*Figure 2*).

The “J wave or Osborn wave” was first described by Dr. John Osborn in 1953 as a “current of injury” which resulted from experimentally induced hypothermia. Osborn waves are the positive deflections of the ST-T wave junction and are best seen in the inferior leads and lateral precordial leads. Their size becomes more pronounced as the body temperature drops, and they gradually disappear with rewarming. The Osborn waves can predispose to ventricular arrhythmias, thus, the presence of this should keep the treating physician more alert while providing patient care. Osborn waves can also be seen in other clinical conditions such as idiopathic ventricular fibrillation, hypercalcemia, brain injury, Brugada syndrome, and vasospastic angina.

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Footnote

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Conflicts of Interest: Both authors have completed the ICMJE uniform disclosure form (available at <https://amj.amegroups.com/article/view/10.21037/amj-23-27/coif>). The authors

have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this “Images in Clinical Medicine”.

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