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ANSWER TO THE PHOTO QUIZ

ECG in hypothermia

Keywords - Osborn waves, hypothermia

Diagnosis

The short ECG registration of lead II revealed classic signs of hypothermia such as bradycardia, a prolonged QT interval and Osborn waves. This distinct bulging of the J point, at the beginning of the ST segment, was first described by John J. Osborn in the American Journal of Physiology in 1953, based on studies involving experimental hypothermia in dogs.[1]

These waves, also known as J waves, are caused by an increased repolarisation of the epicardial potassium channels. They are characteristically seen in hypothermia (<30°C) but can also be seen in hypercalcaemia (our patient had a normal calcium level).[2] Osborn waves in hypothermia, together with Brugada syndrome and all types of early repolarisation, are considered to be a spectrum of J-wave syndromes, known for their risk for ventricular fibrillation and asystole.[3] Osborn waves become more prominent as the temperature drops and regress gradually during rewarming. Secondly, their amplitude increases when the heart rate increases.[4]

In our patient, an ECG could not be performed because she developed asystole shortly after arrival for which cardiopulmonary resuscitation (CPR) was successfully performed. After our patient was warmed, her ECG showed that the Osborn waves had disappeared *(figure 2)*. She recovered fully and was discharged from the hospital three weeks later.

Hypothermia can be mild (35-32°C), moderate (32-28°C) or severe (<28°C). Rewarming techniques may be passive, active external, or active internal, depending on the severity and the clinical facilities. CPR modifications in hypothermia are based on a slowed drug metabolism and unresponsiveness of the hypothermic heart to cardio-active drugs and defibrillation. To prevent myocardial injury, it is reasonable to withhold CPR drugs and shocks until the patient has been warmed to a core temperature ≥30°C and to double the intervals between drug doses until normothermia (≥35°C) is reached.[5]

Conclusion

Osborn waves in severe hypothermia

Disclosures

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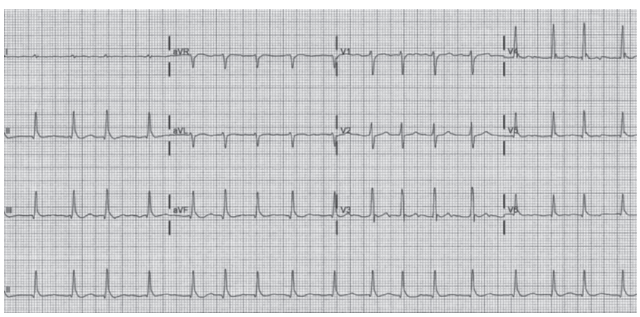

Figure 2. Disappearance of Osborn waves in normothermia