Dynamic ECG changes in a patient with subarachnoid haemorrhage

Dynamiczne zmiany w EKG u chorego z krwotokiem podpajęczynówkowym

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Acute cerebro-vascular disorders (ACVD) such as sub-arachnoid haemorrhage (SAH) increase sympathetic activity and α-adrenergic stimulation. Pathologic α-adrenergic stimulation can provoke several electrocardiogram (ECG) changes including ST-segment depression, wide, broad T-waves, U-waves merging into the T-waves, and QTc prolongation. Previous reports have shown that J-waves can appear in patients with ACVD and a brain injury [1–3]. J-wave is a deflection occurring at the J-point described by Osborn and called ‘the injury current’ in experimental models of hypothermia in dogs [4]. In addition to hypothermic patients, the J-wave can be observed in hypercalcaemia and arrhythmogenic disorders such as in patients with idiopathic ventricular fibrillation (VF) who usually depict the so-called ‘Haissaguerre pattern’ [5, 6]. We previously reported the case of patient with SAH and a prominent J-wave associated with VF [7].

The aim of this presentation is to report an unusual ECG presentation in a patient with SAH.

We present the case of a 36-year-old man with recent SAH. He was admitted to the ER because of persistent and ‘in-crescendo’ headache. ECG on admission showed sinus rhythm at 60 bpm, PQ interval of 180 ms, QTc of 480 ms,

Figure 1. Electrocardiogram on admission (see details in the text). Diffuse ST-segment depression with prolonged T_peak–T_end interval.

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computed tomography (CT) scan was performed. This scan showed acute SAH. ECG recorded 24 h after admission presented broad, positive T-waves in leads V2–V5 and prolonged Tpeak–Tend interval to 160 ms (Fig. 2). A later ECG recorded on the second day showed sinus rhythm with ST-segment normalisation. Additionally, new J-waves were observed in all leads, being negative in leads aVR and V1, and positive in the
rest of the leads (Figs. 3A, B). The maximum amplitude of the J-wave was 2 mm in the limb leads (lead II) and 4 mm in the precordial leads (lead V4) (Fig. 3B). No dangerous ventricular arrhythmias were observed. Diffuse ST-segment depression similar to the one observed in acute coronary syndromes can occur in patients with ACVD [8]. ECG changes can be dynamic involving also T-wave inversion and QT prolongation.

The above mentioned ECG changes, in a patient with acute and persistent headache, should raise a concern about possible ACVD.

Conflict of interest: none declared

References