Ischaemic changes in electrocardiography (ECG) after attempted suicide by hanging (transient left ventricular apical ballooning)

*M KN Ratnayake, C Pathiraja, AN Ranathunga
Medical Officer, Anaesthesia/ICU; Consultant Anaesthetist, Medical Officer, Emergency Treatment Unit, Provincial General Hospital, Ratnapura, Sri Lanka.

*Corresponding author: namalrath10@yahoo.com

A 19 year old girl presented with extensive T inversions on ECG after attempted suicide by hanging. Her past medical history was normal. 2D-echo findings and troponin I were negative. These ECG changes were present over a 9 weeks duration without any clinical features and got completely cured. This is called Apical Ballooning Syndrome (ABS) which mimics acute coronary syndrome.

Key words: hanging; ECG changes

Introduction

Transient left ventricular apical ballooning or ‘broken heart syndrome,’ also called Takotsubo cardiomyopathy, is a cardiac condition that mimics the clinical presentation of acute coronary syndrome. The phenomenon of transient apical ballooning induced by emotional stress was first described in Japan and has a predisposition for postmenopausal females. It is characterized by an akinetic left ventricular apex that takes an elliptical shape with normal coronary arteries. In ventriculogram, it shows as ballooning out of the apex and hence the name was given as Apical Ballooning Syndrome (ABS). The aetiology of this stress-induced cardiomyopathy is yet unclear, Catecholamines seem to be a triggering factor. Excessive catecholamine stimulation may result in direct cardiac myocyte toxicity and also lead to microvascular endothelial dysfunction or spasm. ABS is reported in extreme physical or emotional stress and attempted suicidal hanging. We report a patient with Apical Ballooning Syndrome presenting as deep T inversions in electrocardiogram (ECG) after attempted suicide by hanging.

Case report

A 19 year old girl was admitted to emergency treatment unit after attempted suicide by hanging. On admission, she was confused, restless, dyspnoeic and complained of chest pain. Her pupils were equally reacting to light and Glasgow Coma Scale was 9/15 (E-3, M-4, V-2). Her blood pressure was 86/60 mmHg, pulse rate was 100/min and SpO2 96% on room air. She was electively intubated and transferred to ICU for mechanical ventilation. Her 12 lead ECG done on admission was normal (Figure 1).

Figure 1: ECG on admission
Propofol infusion was started and continued for the next 24 hours. Systolic blood pressure became more than 100mmHg with 2 boluses of 200ml normal saline. ECG was repeated in 4 hours time and T wave inversions were noted in Lead I, II, aVL, and V₂-V₆. (Figure 2)

**Figure 2: ECG- 4hours after the admission**

Next morning as she was conscious and rational, after the leak test, she was extubated. Following extubation throughout her hospital stay, she had stable haemodynamic parameters. Time to time she complained of mild retrosternal chest pain. Serial ECG showed progression into deep T wave inversions and new one appearing in V₁. (Figure 3)

**Figure 3: ECG- 44hours after the admission**

Troponin I was negative and no abnormality was found in 2D echocardiogram. We were unable to do a ventriculogram or coronary angiogram. Chest pain was managed with paracetamol. During her ICU stay enoxaparin 40mg was given daily. Her initial serum K⁺ level was 3.6mmol/L (3.5-5.1) and repeat measurements were found to be within normal levels. Following investigations were done during her ICU stay. Na⁺ 140mmol/L, WBC 12 x 10³/µL, neutrophils 40%, lymphocytes 58%, platelets 220 x 10³/µL, Hb 12.1g/dL, blood urea 3.5mmol/L, creatinine 92µmol/L, SGOT 78U/I, SGPT 44U/I. There were no changes seen in chest x-ray and cervical spine x-rays. After 3 days of ICU treatment, she became completely normal and was transferred to the surgical ward. After discharge from hospital she was followed up with serial ECGs which became normal after about 9 weeks of the incident. (Figure 4)
Discussion

In our patient the first ECG change was noted by 4-5 hours following the initial incident and T inversions became deep over the next 48 hours. As she complained of retrosternal chest pain cardiac enzyme assay was done and became negative. At this stage we were reluctant to diagnose this as acute coronary syndrome because the patient was a teenage girl and had no significant past medical history or family history of heart disease. But to be safe it was decided to start prophylactic low molecular weight heparin. Transient left ventricular dysfunction associated with attempted suicide by hanging or accidental strangulation has been previously described.5,6,7

Myocardial perfusion studies using single photon emission computed tomography (SPECT) and technetium-99m tetrofosmin tomographic myocardial imaging indicate reversible myocardial ischemia in ABS, in the absence of coronary artery occlusion.8 ECG changes such as T wave inversion,5,9 ST elevation, QT prolongation and U waves9 have been previously reported in partial hanging.

References


http://dx.doi.org/10.1016/j.jflm.2013.03.011
PMid:23756532