

CARDIAC DYSRHYTHMIA THAT SIMULATES SEIZURE DISORDER IN TWO CHILDREN*

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SUMMARY: Turanlı G, Apak RA. (Neurology Unit, Department of Pediatrics, Hacettepe University Faculty of Medicine, Ankara, Turkey). Cardiac dysrhythmia that simulates seizure disorder in two children. Turk J Pediatr 1999; 41: 521-523.

Cardiac dysrhythmia can present signs and symptoms of a seizure disorder and sometimes they are clinically indistinguishable. We present two children with a presumed seizure disorder but also with an underlying and associated cardiac problem. Therefore, we suggest that both conditions must be considered concomitantly, and that each patient with a newly diagnosed seizure disorder requires both neurological and cardiological evaluation. *Key words: seizures, dysrhythmia.*

Cardiac dysrhythmia can present signs and symptoms of a convulsive disorder and in many cases both disorders may be clinically undifferentiated¹. There are no clues or criteria to differentiate these two conditions, and this may result in inappropriate and also ineffective treatments. Sometimes, the underlying cardiac abnormality may be fatal and may lead to sudden death of the patient with presumed epilepsy². Early diagnosis and treatment of an underlying cardiac problem in these patients could, therefore alleviate symptoms and prevent sudden deaths

We report two children with an initial diagnosis of epilepsy having an underlying, unsuspected cardiac problem.

Case Reports

Case 1

A 12-year-old boy had a three-year history of a presumed seizure disorder slightly responsive to antiepileptic treatment. Initial episodes were precipitated by exercise and preceded by an aura that included nausea and vomiting. Later, he developed pallor and perioral cyanosis with tonic deviation of the eyes and tonic-clonic jerks in all extremities. He experienced six more seizures of the same type and had been prescribed phenytoin treatment after the second episode by his family physician. After his last seizure he was found to be

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bradycardiac, and was then referred to our center for cardiologic work-up. On admission, physical examination, including a detailed neurological examination, was normal except for a pulse rate of 48/min. Blood pressure measurements both at sitting and standing positions were normal. Electrocardiography (ECG) showed atrioventricular dissociation. Twenty-four hour Holter monitoring revealed ventricular extrasystoles and attacks of ventricular tachycardia. Echocardiography, routine electroencephalography (EEG), sleep-deprived EEG and EEG video monitoring testings were normal. He was diagnosed as sick sinus syndrome and started on β -blocker treatment; phenytoin was withdrawn progressively. At his one year of follow-up, he had not experienced any seizure.

Case 2

A nine-year-old girl was admitted with a history of loss of consciousness, occurring at school following sudden risings preceded by nausea and blackout, she could not be aroused for five minutes. She was otherwise healthy. She had a milder episode about one year ago and had complained of a paroxysmal, blunt, frontal headache since then. She had no family history for syncope, migraine or epilepsy. On admission, physical examination, including a detailed neurological examination, was normal. Pulse rate and blood pressure both at sitting and standing positions were normal. An EEG revealed generalized paroxysmal activity provoked by photic stimulation. Brain magnetic resonance imaging (MRI) was normal. She was diagnosed as having photosensitive epilepsy and was started on valproic acid treatment. Despite her regular antiepileptic treatment, she experienced two more syncopal attacks and needed further cardiologic evaluation that revealed a normal ECG with a normal corrected QT interval, normal Holter monitoring and echocardiography. However, tilt-table test was positive on the 7th minute. She was advised not to rise suddenly or stand for a long time. Within the following six months, her EEG returned to normal and she became seizure-free.

Discussion

Many reports in the literature have shown a well-documented relationship between seizures, dysrhythmias and syncope³⁻⁵. Seizures sometimes may be the leading clinical manifestation of an underlying cardiac dysrhythmia, notably in ventricular tachyarrhythmia; however, there are no specific established criteria to distinguish these conditions⁶. Among these, long QT syndrome (LQT) is one of the important disorders that causes syncope, seizure and sudden death from cardiac dysrhythmias, particularly ventricular dysrhythmias such as torsade de pointes and ventricular fibrillation⁷. LQT can be acquired or inherited, although most cases are probably caused by some combination of environmental and genetic

factors⁸. Therefore, an initial baseline ECG to establish an underlying cardiac dysrhythmia is recommended, especially in newly diagnosed seizures, but a normal ECG does not rule out an underlying disorder and further cardiac investigation may also be required. On the other hand, some reports⁹ stated that seizures may lead to cardiac dysrhythmias such as asystole and supraventricular tachyarrhythmias and furthermore, that these dysrhythmias may lead to convulsive activity and a variety of EEG abnormalities. In our series, the first patient was misdiagnosed with an epileptic disorder until a cardiac problem was suspected after which the precise diagnosis of sick sinus syndrome was made and appropriate treatment was started. This patient no longer needed further antiepileptic treatment, but his convulsive symptoms improved only with β -blocker treatment. In the second patient on the other hand, a cardiac dysrhythmia was most likely present, but EEG was significantly abnormal. These cases demonstrate that convulsive and cardiac disorders may simulate their symptoms as well as associate. To resolve this enigma, further studies to detect the incidence of cardiac dysrhythmia among newly diagnosed and refractory seizure disorders, or clinical trials designed by simultaneous ambulatory monitoring of EEG and ECG in epileptics, are needed.

In conclusion, we suggest that cardiac dysrhythmia contributes to seizure disorder in children more often than previously thought and must be considered in the early management of patients.

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