The Brugada syndrome is an inherited channelopathy disorder. The syndrome is characterized by an electrocardiograph pattern of right bundle branch block and ST elevation in the right precordial leads in the absence of structural heart disease. The main concern regarding these patients is the tendency to develop a ventricular tachyarrhythmia that causes syncope and even sudden death [1]. It is well known that the Brugada ECG pattern is dynamic and might be revealed by certain physiological conditions or pharmacological challenge. We present a case of symptomatic Brugada syndrome leading to syncope, provoked by high fever.

**Patient Description**

A 39 year old healthy Caucasian male, a smoker, presented to the emergency room with fever of 39°C, sore throat and a 5 minute syncopal episode that occurred at home, accompanied by urinary incontinence, without convulsions or a post-ictal period. In the ER the patient was alert but did not recall the syncopal episode and denied any feeling of palpitations, chest pain or dyspnea. His medical history included a number of admissions in his childhood due to recurrent otitis media and a few syncopal events that had occurred more than 20 years previously. The patient was not taking any medications and reported no family history of sudden deaths or arrhythmias.

On arrival his temperature was 38°C, blood pressure 110/70 mmHg, pulse rate 80/min, respiratory rate 20/min, and oxygen saturation 98% in room air. Physical examination revealed follicular exudates on both tonsils and mild submandibular lymphadenopathy. Pulmonary auscultation was normal and heart sounds were regular without pathological sounds or murmurs. A complete blood count showed mild leukocytosis. Chemistry panel and coagulation studies were within normal limits. Electrocardiography revealed mild ST elevation in leads V1 and V2 with a right bundle branch block pattern compatible with a type 1 Brugada-ECG pattern [2] [Figure A].

The patient was admitted and was treated with intravenous antibiotics due to tonsillitis. On the following day his
temperature rose to 39.5°C, and one hour later he experienced syncopal ventricular tachycardia [Figure B]. The patient fully recovered spontaneously. Intravenous magnesium was administered and he was vigorously treated with antipyretics. During the next 2 hours he experienced three additional episodes of syncopal polymorphic ventricular tachycardia, which were terminated by electric cardioversion. The echocardiogram was normal.

For the next few days the patient received “around the clock” antipyretics, along with antibiotics, maintaining body temperature of below 38°C, and was event free. Repeated 12-lead ECG tracing showed regression from Brugada pattern towards normal. A diagnosis of Brugada syndrome was made and the patient underwent cardioverter defibrillator implantation.

Comment
Brugada syndrome is characterized by an ECG pattern consisting of elevated ST segment in precordial leads V1-V3 and morphology similar to that of right bundle branch block along with a propensity for life-threatening ventricular tachyarrhythmias [4]. Physicians should be aware of this phenomenon when presented in patients with Brugada syndrome. The ionic mechanism responsible for the Brugada syndrome had been shown to be temperature-dependent [4]. Sodium channel may be inactivated by fever, unmasking concealed Brugada syndrome.

We present here a patient who was admitted to the hospital due to a syncopal event that appeared concomitant with febrile illness. The fever unmasked a Brugada ECG pattern associated with documented symptomatic ventricular tachycardia events. ECG anomalies were evident as long as fever was present and vanished once the temperature returned to normal. Our patient described episodes of syncope during his adolescence, but these were not documented and no further workup was done, including ECG.

Febrile disease is a common clinical problem sometimes associated with benign syncope due to postural hypotension or vasovagal syncpe. In patients with Brugada syndrome it may be associated with syncopal malignant ventricular tachyarrhythmias [5]. Physicians should be aware of this phenomenon in cases presenting as syncpe associated with febrile disease. The typical electrocardiographic pattern of Brugada syndrome may be revealed by a febrile illness. Treatment should focus on intensive lowering of body temperature and eventually implantation of a cardioverter defibrillator.

References

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Erratum
In the June issue a spelling error appeared in the title of two articles. In the paper by Rosso et al. on page 435, the correct spelling is defibrillator (and not defribrillator); and in the editorial on page 462 by Nof and Antzelevitch, the correct spelling is stratification (and not strataification).

Capsule
Oncogenic mutations
Phosphoinositide 3-kinases (PI3Ks) are lipid kinases that can initiate a variety of signaling events. Many human cancers involve mutations that activate PI3K, a heterodimer comprised of a catalytic subunit, p110 alpha, and a regulatory subunit, p85, both of which contain multiple domains. Huang et al. describe the crystal structure of a complex between the full-length human p110 catalytic subunit and the binding and activation domains of the p85 alpha regulatory subunit. The structure provides insight into how oncogenic mutations affect enzyme activity and could assist in the future design of isoform- or mutation-specific inhibitors.

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