Fascicular Ventricular Tachycardia in an Adolescent with H1-N1 Influenza Infection: Case Report

H1-N1 İnfluenza Enfeksiyonu Saptadığımız Fasiküler Ventriküler Taşikardili Genç Hasta

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ABSTRACT Ventricular tachycardia is a life-threatening arrhythmia which requires rapid diagnosis and treatment. Generally ventricular tachycardia can be triggered by ischemia, exercise, fever, infections, myocarditis, drugs, bradycardia, alcohol consumption, physical and emotional stress. Viral infections are well known to be associated with arrhythmias. Fascicular ventricular tachycardia which most commonly affects individuals without structural heart disease is separated from other ventricular tachyarrhytmias with specific electrocardiographic findings. Response to verapamil is an important feature of fascicular tachycardia. We report a 16 year-old teenager who was admitted to our emergency department with fever and palpitation and his electrocardiography was consistent with fascicular ventricular tachycardia which was responsive to verapamil. H1-N1 influenzae virus was isolated from the patient's nasal swap by the polymerase chain reaction. This case suggests an association between fascicular ventricular tachycardia and influenzae virus infection.

Key Words: Tachycardia, ventricular; influenzae A virus, H1N1 subtype; verapamil

ÖZET Ventriküler taşikardi hızlıca tanınıp tedavi edilmesi gereken ölümcül bir aritmidir. Ventriküler taşikardi sıklıkla iskemi, egzersiz, ateş, enfeksiyonlar, miyokardit, ilaçlar, bradikardi, alkol tüketimi, fiziksel ve duygusal stres gibi faktörler tarafından tetiklenebilir. Viral enfeksiyonların aritmiler ile ilişkisi iyi bilinmektedir. Sıklıkla yapısal kalp hastalığı olmayan bireyleri etkileyen fasiküler ventriküler taşikardi ise spesifik elektrokardiyografik özellikleriyle diğer ventriküler taşiaritmilerden ayrılır. Verapamile duyarlı olması önemli bir özelliğidir. Biz burada acil servisimize ateş ve çarpıntı nedeniyle başvuran elektrokardiyografisi fasiküler ventriküler taşikardiyle uyumlu ve verapamil ile tedavi edilen 16 yaşındaki genç hastayı sunduk. Hastanın burun sürüntüsünden polimeraz zincir reaksiyonu ile H1-N1 influenza virusu izole edildi. Olgu sunumumuzda, fasiküler ventriküler taşikardi ile influenza virus enfeksiyonu arasında bir ilişki olabileceğini öne sürmek istedik.

Anahtar Kelimeler: Taşikardi, ventriküler; influenza A virüsü, H1N1 alttip; verapamil

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Idiopathic fascicular ventricular tachycardia (VT) is an important cardiac arrhythmia which is typically seen in individuals without structural heart disease. It is characterized by right bundle branch block morphology with moderate degree QRS widening. The QRS axis depends on which fascicle is involved in the re-entry. Left axis deviation is noted with left posterior fascicular tachycardia and right axis deviation with left anterior fascicular tachycardia. Verapamil sensitivity is also an important feature of fascicular tachycardia.[1] We hereby report a case of fascicular VT occurred during H1-N1 influenzae A infection.

CASE REPORT

A-16 year old adolescent was admitted to our emergency department with a complaint of palpitation which developed two hours before his arrival at hospital. He had complaints of fever, myalgia, sore throat, rhinorrhea for three days. He was not taking any medications and he was in first medical contact after the symptoms started. The patient was otherwise healthy and did not have any disease or complaint before. There was no familial past history of cardiac disease. On physical examination; patient was excessively sweating, his blood pressure was 104/64 mmHg with a heart rate of 185 per minute and respiration rate was 22 per minute. The patient's heart sounds were normal without murmur. His fever was 39 °C. Electrocardiography showed relatively narrow QRS tachycardia with a QRS duration of 132 msn, right bundle branch block morphology with superior axis which was suggestive of fascicular VT (Figure 1). Intravenous verapamil (5 mg) was administered in five minutes. The patient was in sinus rhythm after administration of verapamil and had relief of symptoms. CBC showed mildly elevated white blood cells (11.300 μ/l) especially lymphocytosis. Troponin and CK-MB levels were at normal ranges on admission and were not elevated during the hospitalization period. Chest radiography was normal. Transthoracic echocardiography revealed no wall motion abnormalities and no pericardial effusion. Systolic and diastolic functions, chamber sizes were all normal.

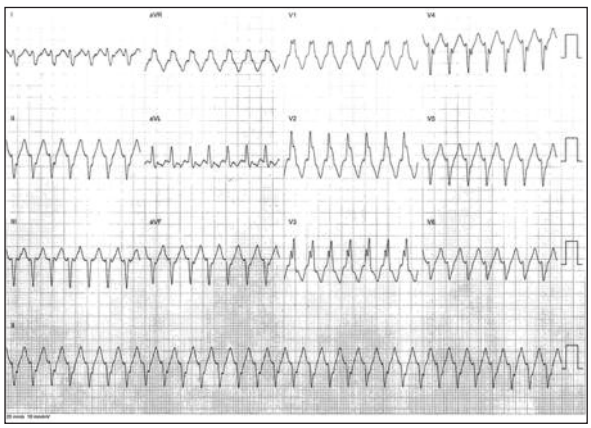

FIGURE 1: Electrocardiography showing relatively narrow QRS tachycardia right bundle branch block morphology with superior axis.

Influenzae A virus (H1-N1) was isolated from the patient's nasal swab by the polymerase chain reaction (PCR). Oseltamavir 75 mg twice a day, acetominofen 500 mg twice a day; verapamil 80 mg three times a day were administered. He had no symptoms and did not have any tachycardia episode during hospitalization. The patient was informed about electrophysiological study (EPS). He denied EPS. He was discharged at seventh day with oral verapamil treatment.

DISCUSSION

VT is a life-threatening arrhythmia which requires rapid diagnosis and treatment. It is usually associated with coronary artery disease but there are also specific forms of VT. Zipes et al. reported three young patients with VT characterized by QRS width of 120 to 140 ms, right bundle branch block morphology and left-axis deviation without cardiac abnormalities.[2] This specific arrhythmia can be induced by exercise, atrial and ventricular premature beats, atrial pacing and ventricular pacing . Belhassen et al.[3] observed that this tachycardia can be terminated by the calcium channel blocker verapamil. This arrhythmia is called fascicular VT, but it is also called Idiopathic Left Ventricular Tachycardia by some authors.[4] Generally VT can be triggered by ischemia, exercise, fever, infections, myocarditis, drugs, bradycardia, alcohol consumption, physical and emotional stress. Viral infections are well known to be associated with arrhythmias. Arrhythmias and conduction disorders have been found in 15% of patients with influenzae virus infection, based on standard ECG, and 70% based on Holter monitoring.[5] Bashour and Wald.[6] reported a thirteen-year-old girl, with a typical influenzae syndrome complicated by sustained VT. Also some forms of VT shown to be associated with fever and infections. Fujita et al reported 7 year old girl with right ventricular outflow tract VT exacerbated by fever and influenzae infection.[7] Kusaka et al. reported a 32-year-old man with electrocardiographic changes consistent with Brugada syndrome during influenzae virus infection. Samani et al.[9] reported febrile illness predisposes individuals with Brugada syndrome who carry a loss of function

SCN5A mutation, to fever-induced ventricular arrhythmias by significantly reducing the sodium currents in the hyperthermic state. Burashnikov et al. reported that hyperthermia can be associated with an increased arrhythmic risk when the repolarization reserve of the myocardium is compromised.[9,10] Especially in patients with Long-QT conditions fever accentuates transmural dispersion of repolarization and facilitates the development of early afterdepolarizations and torsade de pointes. Fever is a trigger for episodes of VT in Brugada syndrome, RVOT VT, Long QT syndromes. This is the first case of fascicular VT occurred during a febrile episode. Influenzae is a cardiotrophic virus which is associated with myocarditis and rhythm disturbances as mentioned before. In our case the patient either did not have any chest pain or symptoms associated with heart failure during hospitalization. Also, cardiac biomarkers were all in normal range and he had normal echocardiographic findings. According to these findings we excluded myocarditis as a diagnosis.

In conclusion, like other cases of VT, influenzae can be a trigger for fascicular VT. It seems that both influenzae and the fever were the triggers for fascicular VT in this case.

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