Low Dose Carvedilol Therapy in Catecholaminergic Polymorphic Ventricular Tachycardia (CPVT): A case report

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Introduction: Catecholaminergic polymorphic ventricular tachycardia (CPVT) is a relatively rare inherited disease presenting with arrhythmic events during physical exercise or emotional stress. CPVT is caused by mutations in genes encoding ryanodine receptor type 2 (RyR2) and cardiac calsequestrin (CASQ2). About 80% of affected individuals experience recurrent syncope, and 30% experience cardiac arrest. Bisoprolol (β-blocker) is the first-choice treatment of CPVT therapy, but attention should be paid to side effects of bradycardia, hypotension and heart failure. In recent years, it has been reported that flecainide is effective for CPVT, but it is reported that it is necessary to administer a high capacity. Carvedilol acts directly on RyR2 and its effect to suppress Ca²⁺ release has been reported, and there is a possibility that it is effective for CPVT, but there are few reports that it is effective for CPVT.

Methods: A 7 year-old man presented with syncope once every 2 months when he was intensely Karate training, running, or excited about computer game with his friends. There was nothing in the past history and family history. ECG findings at rest and UCG findings were normal. We strongly suspected CPVT as the underlying disease, because the patient's medical history included recurrent syncope during physical and emotional stress. Holter ECG during Karate performance showed polymorphic VT. As a result of genetic screening, missense mutation of the previous announcement was detected in RyR2, and we diagnosed him as CPVT. We started of oral treatment of carvedilol 0.21mg/kg/day, concerned about his very young age and side effects of bisoprolol (bradycardia and decreased tolerability of exercise) after careful and sufficient informed consent.

Result: Ten months have passed after starting medication, no syncope is appreciated despite the fact that he was continuing intense training in baseball. No VT was recorded by treadmill exercise test without increasing dose of carvedilol.

Conclusion: We present a case that low dose carvedilol for CPVT patient was effective.