Asymptomatic accelerated idioventricular rhythm in a 5-year-old girl

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Introduction

We present the case of a 5-year-old girl with an incidental finding of asymptomatic accelerated idioventricular rhythm with no history of structural heart disease. Family consent has been obtained in writing.

Case

A 5-year-old girl was referred to the community pediatrician with an incidental finding of short bursts of fast heart rate on physical examination. She was asymptomatic. There were no complaints of palpitations, chest pain, dizziness, or syncope. Her past history was unremarkable. Her electrocardiogram showed sinus rhythm with frequent consecutive premature ventricular contractions with left bundle branch block morphology (Figure 1). Her echocardiogram was normal. Her holter monitor showed predominantly sinus rhythm with very frequent monomorphic ventricular ectopics and 16% QRS complexes with fusion beats. The longest episode of the accelerated ventricular rhythm was 35 beats at 113 beats per minute. There were no pauses. The diagnosis was confirmed as an accelerated idioventricular ventricular rhythm (slow ventricular tachycardia). The child has followed a benign course without symptoms or syncope, and no treatment was required.

Discussion

Accelerated idioventricular rhythm (AIVR) is a benign arrhythmia and is often a self-limited condition, particularly in young infants.[1,2] It is an enhanced ectopic ventricular rhythm and may be confused with potentially serious rhythm disorders, such as ventricular tachycardia (VT). It has at least three consecutive premature ventricular beats, with gradual onset and termination. The usual rate of AIVR is <120 beats per minute (bpm). It is typically faster than normal intrinsic ventricular escape rate of 30-40 bpm, but slower than the rate of VT.[3-6]

AIVR is thought to be related to enhanced automaticity in His-Purkinje fibres or the myocardium. Spontaneous cell depolarization rates can be accelerated by ischemia, reperfusion, hypoxia, drugs, and electrolyte abnormalities, leading to enhanced automaticity of the ectopic focus.

Due to its slow ventricular rate, AIVR is generally a benign and well tolerated arrhythmia that resolves spontaneously without treatment.1 However, the arrhythmia should be treated in rare situations, such as sustained or incessant AIVR, or when AV dissociation induces syncope, increasing the risk of sudden death.1 In a report on 19 patients diagnosed with AIVR, 13 showed spontaneous resolution while six continued to exhibit persistent VT at their last follow-up.[7] Those who were treated appeared to respond well to all prescribed medications.[7]

AIVR can be found in patients with a structurally and functionally normal heart.8 This arrhythmia has also been associated with cardiac pathology, such as myocardial infarction in adults and congenital heart disease in children.[8-11] AIVR is often observed in the reperfusion phase following an acute myocardial infarction, drug toxicity, electrolyte imbalance, or congenital heart disease.[1,2] Treatment of underlying aetiologies may lead to complete resolution of the arrhythmia.

It is important to differentiate AIVR, which often resolves spontaneously, from pathologic VT in order to avoid potentially toxic antiarrhythmic agents.13 The characteristic gradual onset and termination of AIVR are useful in differentiating it from slow VT, which is associated with sudden onset and termination. Further criteria were proposed to differentiate AIVR from VT.8 These criteria included chance discovery, absence of symptoms, sinus isochronicity, heart rate <120 bpm, conversion to sinus rhythm with exercise, arrhythmia in short bursts, no effective drug treatment, and presence of left bundle branch block morphology. Our patient met at least 6 of these criteria. A formal exercise test was not performed, nor was drug treatment attempted.

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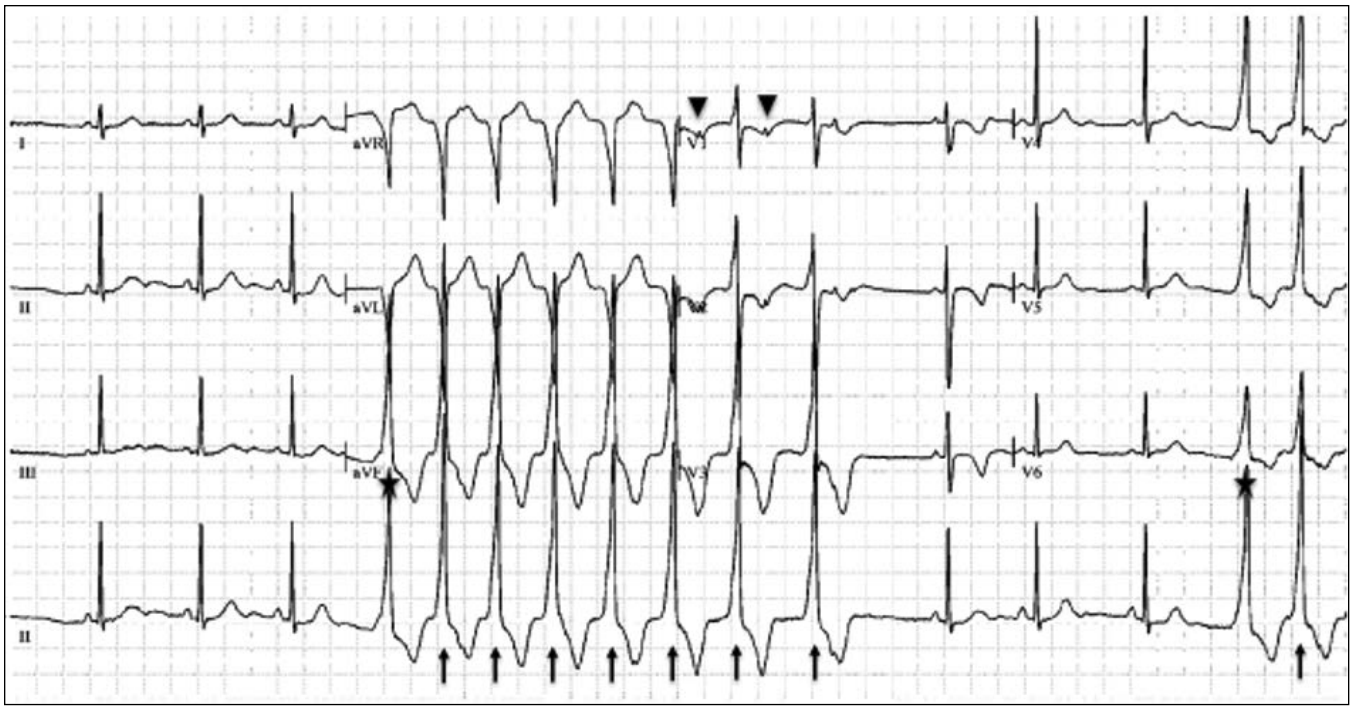

Figure 1. Electrocardiogram showing accelerated idioventricular rhythm with left bundle branch block morphology. Arrows indicate wide complex ventricular rhythm at 150 beats per minute. Triangles indicate P waves demonstrating AV dissociation. Star indicates fusion beat with a P wave, short PR interval, and narrow QRS complex. The preceding sinus rhythm is 85 beats per minute.

Conclusions

AIVR is a benign ventricular arrhythmia that requires differentiation from VT. It is generally benign and well tolerated, and most often resolves spontaneously and requires no treatment. However, patients should be followed to resolution to monitor cardiac function, as a decline in cardiac function may rarely occur in patients with frequent ventricular ectopy.13 Pediatricians can aid in differentiation from VT, emphasize the benign nature of AIVR, monitor patients, and provide reassurance.

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