

Letter to the Editor

Accidental intra-arterial injection of adenosine in a patient with supraventricular tachycardia

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Supraventricular tachycardia is the most common symptomatic arrhythmia in children. Acute management in haemodynamically stable patients is pharmacological. The drug of choice is adenosine, a metabolite of adenosine triphosphate, which causes conversion to sinus rhythm by transient atrioventricular block.¹

We describe the case of a 12-year-old girl with supraventricular tachycardia due to Wolff–Parkinson–White syndrome. The tachycardia started during physical exercise and both Valsalva manoeuvre and administration of propranolol were tried unsuccessfully. Upon arrival at the hospital, the patient was pale but haemodynamically stable, and the rate of tachycardia was 190 beats per minute. By accident, the intravenous cannula was placed into the left brachial artery and the first dosage of adenosine 150 micrograms per kilogram was administered intra-arterially, followed by a flush of 20-millilitre isotonic saline. This resulted in transient pain and mottling of the skin of the forearm. The girl reported blurred vision, dizziness, and nausea. Pulsatile movement of blood was seen in the intravenous tubing and the cannula was removed. Within 10 minutes, the side effects disappeared and a new intravenous cannula was placed. A second dose of adenosine 200 micrograms per kilogram was given as an intravenous bolus, with conversion to sinus rhythm as a result. Inspection of the left arm revealed no abnormalities.

To the best of our knowledge, this is the first report on the accidental intra-arterial administration of adenosine. Adenosine is an endogenous nucleoside, formed by dephosphorylation of adenosine triphosphate.² Adenosine causes vasodilatation by relaxation of the vascular smooth muscle. Patients can experience this as flushing, lightheadedness, and/or dizziness.

Owing to the short half-life time of adenosine – less than 10 seconds – these side effects are short-lived.^{1–3} In our patient, we observed a transient local response with mottling of the skin. Blurred vision, nausea, and dizziness lasted for about 10 minutes. These adverse events presumably are caused by the intra-arterial injection of adenosine.

Iatrogenic intra-arterial injection of drugs is associated with limb ischaemia, skin necrosis, paresthesias, and temperature hypersensitivity.⁴ Intra-arterial placement should be suspected when a bright red backflow of blood into the intravenous catheter is seen, in the presence of pulsatile movement of blood, in distal signs of ischaemia, and when a pulse is palpable proximal to the injection site.⁵ Prevention and early recognition are of vital importance in reduction of adverse events.⁴

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References

1. Ratnasamy C, Rossique-Gonzalez M, Young ML. Pharmacological therapy in children with atrioventricular reentry: which drug? *Curr Pharm Des* 2008; 14: 753–761.
2. Manjunath S, Sakhare PM. Adenosine and adenosine receptors: newer therapeutic perspective. *Indian J Pharmacol* 2009; 41: 97–105.
3. Paul T, Pfammatter J-P. Adenosine: an effective and safe antiarrhythmic drug in pediatrics. *Pediatr Cardiol* 1997; 18: 118–126.
4. Sen S, Chini EN, Brown MJ. Complications after unintentional intra-arterial injection of drugs: risks, outcomes, and management strategies. *Mayo Clin Proc* 2005; 80: 783–795.
5. Ghouri AF, Mading W, Prabaker K. Accidental intraarterial drug injections via intravascular catheters placed on the dorsum of the hand. *Anesth Analg* 2002; 95: 487–491.

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