

Transient phlebitis: an unusual effect of intravenous diphenhydramine

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DESCRIPTION

A 29-year-old man with no known allergies and end-stage renal disease due to IgA nephropathy presented for kidney transplantation. In the preoperative area, an 18 G intravenous cannula was placed in the lateral dorsal side of the left hand cephalic vein. Immediately after intravenous injection of undiluted 1 mL of 50 mg diphenhydramine hydrochloride (West-Ward Pharmaceuticals Eatontown, New Jersey, USA), patient developed transient burning pain and erythema in the volar and dorsal forearm tributaries of the cannulated vein ([figure 1](#)). The episode was not associated with itching, haemodynamic changes or signs of a systemic allergic reaction. We flushed the vein with a normal saline infusion and the erythema resolved after 30 min. The patient was diagnosed with phlebitis based on the Infusion Nurses Society phlebitis scale.^{1–3} Anaesthesia was induced and maintained through the same intravenous cannula uneventfully. The patient denied any pain, lumps or hardening of the forearm veins during and after hospital stay.

Phlebitis is the inflammation of the internal lining, tunica intima, of a vein. It is associated with pain, swelling and erythema around the intravenous cannula insertion site or along the course of the vein without systemic involvement.⁴ In severe cases, it may lead to thrombosis of the vein which manifests as a small lump. Causative agents may be mechanical (size, location, composition of intravenous cannula), chemical (drugs, infusates) or biological (infections). Chemical phlebitis occurs when solutions with particulate matter, high concentration (>10 mg/mL) and high or low pH irritate veins. Old age, thin body habitus and atopic tendency have also been thought to increase incidence and severity.⁵

Transient phlebitis has been described after intravenous administration of several drugs (meperidine, morphine, rocuronium, propofol, eptifibatid and ciprofloxacin).^{5–10} Hypothesised mechanisms associated with this phenomenon include tissue damage, local mediator release, histamine release, direct activation of C-nociceptors and activation of kallikrein-kinin system with bradykinin generation.^{5,6}

Diphenhydramine is an antihistamine (H-1 receptor antagonist) with anticholinergic and sedative effects. In the parenteral form, diphenhydramine hydrochloride is supplied at a concentration of 50 mg/mL and a pH of 4.0 to 6.5 that is adjusted with either sodium hydroxide or hydrochloric acid. It is recommended to be infused at a rate not exceeding 2.5 mg/min.¹¹ To the best of



Figure 1 Erythema in the left forearm volar veins immediately after diphenhydramine injection.

Learning points

- ▶ Phlebitis is associated with pain, swelling and erythema along the course of a vein.
- ▶ Intravenous diphenhydramine can cause transient phlebitis.
- ▶ Appropriate drug dilution and slow infusion can decrease incidence.

our knowledge, there has not been any published reports, with pictorial evidence, of transient phlebitis caused by intravenous administration of diphenhydramine hydrochloride. Diluting diphenhydramine appropriately, infusing at recommended rate and using a large vein for infusion can prevent this side effect.

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