

LETTER TO EDITOR (VIEWERS CHOICE)

IMMEDIATE HYPERSENSITIVITY REACTION TO KETAMINE IN A CHILD: A CASE REPORT

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Hypersensitivity reactions during pediatric procedural sedation are rare but may be life-threatening, and identification of the culprit drug is often challenging due to the concomitant use of multiple agents. Neuromuscular blocking agents and antibiotics are the most frequently implicated, while ketamine is considered a safe and widely used sedative, with allergic reactions being exceedingly uncommon.^{1,2}

We report the case of a previously healthy 7-year-old girl with no personal or family history of atopy, who presented to the emergency department with a forearm fracture. Procedural sedation was performed with intravenous ketamine (1 mg/kg) and midazolam (0.05 mg/kg). Within minutes, she developed an erythematous macular rash involving the trunk, face, and upper limbs, sparing palms and soles, without respiratory, gastrointestinal, or cardiovascular involvement. Intravenous hydrocortisone (1 mg/kg) was administered, with rapid and complete resolution of symptoms. She was discharged asymptomatic after observation.

Eight months later, allergological evaluation was performed. Skin testing was conducted according to ENDA/EAACI recommendations.³ Skin prick testing with ketamine (10 mg/mL) was negative, whereas intradermal testing at 1 mg/mL was positive. Skin prick and intradermal tests with midazolam were negative. A graded drug provocation test with midazolam was subsequently performed and well tolerated, excluding hypersensitivity. These findings supported hypersensitivity to ketamine.

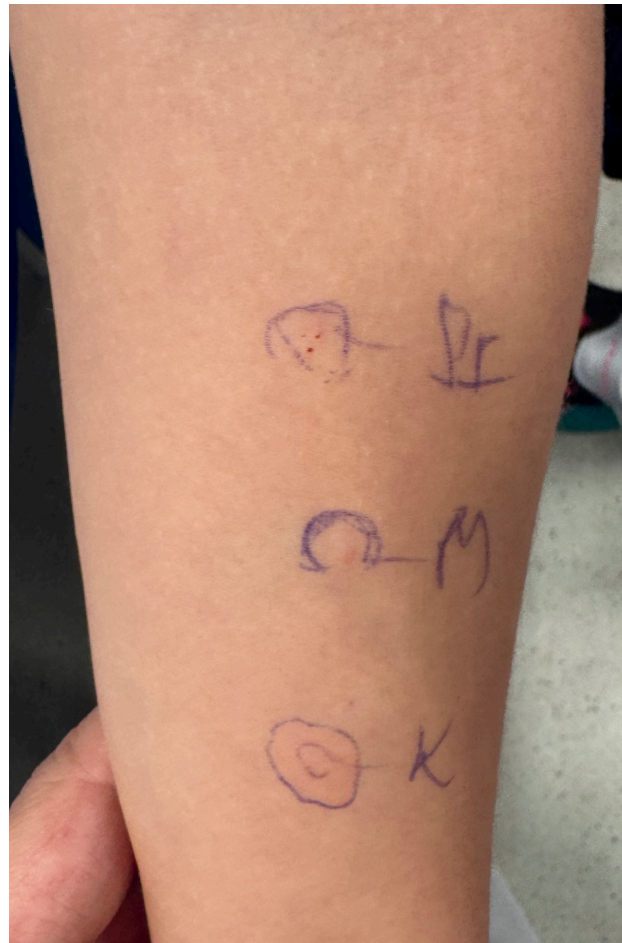
Most perioperative hypersensitivity reactions are not IgE-mediated. Ketamine has been shown to induce direct mast cell degranulation, leading to immediate non-IgE-mediated reactions.^{4,5} Additionally, activation of mast cells via the Mas-related G protein-coupled receptor X2 (MRGPRX2) has emerged as an important mechanism underlying immediate drug hypersensitivity reactions, particularly in the absence of a clear

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Figure 1: Intradermal tests



sensitization period. These reactions may clinically mimic IgE-mediated allergy and, in some cases, be associated with positive intradermal testing, making mechanistic distinction challenging.

In the present case, the absence of prior exposure to ketamine precludes definitive confirmation of an IgE-mediated mechanism. Although the positive intradermal test supports an immediate hypersensitivity reaction, non-IgE-mediated mast cell activation remains a plausible alternative explanation. The rapid resolution



of symptoms is consistent with a mild immediate hypersensitivity reaction. Large pediatric series have shown that most reactions during procedural sedation are mild, self-limited, and predominantly cutaneous, with severe anaphylaxis being rare.²

Accurate identification of the culprit drug is essential to prevent re-exposure and guide safe anesthetic management. Referral to an allergology specialist is crucial to support diagnosis and identify safe alternatives for future procedures.

In conclusion, although ketamine is widely used in pediatric sedation, hypersensitivity reactions remain rare. This case highlights the importance of recognizing such reactions and reinforces the role of systematic allergological evaluation in ensuring patient safety.

Compliance with Ethical Standards

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Conflict of Interest: None

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