

CASE REPORTS PRIKAZI SLUČAJEVA

CHALLENGES IN THE ANAESTHETIC CARE OF A CHILD WITH CONFIRMED ALLERGY TO MIDAZOLAM, ATROPINE AND ROCURONIUM – A CASE REPORT

IZAZOVI U ANESTEZIOLOŠKOM ZBRINJAVANJU DETETA SA POTVRĐENOM ALERGIJOM NA MIDAZOLAM, ATROPIN I ROKURONIUM – PRIKAZ SLUČAJA

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Case report

Prikaz slučaja

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Abstract

Introduction. Drug hypersensitivity reactions represent a major safety concern in anaesthetic practice, particularly in paediatric patients, in whom recognition can be difficult and clinical deterioration may occur rapidly. **Case Report.** We present the case of a 5-year-old child who developed an allergic reaction during a previous general anaesthesia. Based on the results of allergy test results, an individualised anaesthetic plan was developed, including the selection of alternative agents. Anaesthesia was performed successfully with no adverse reactions. **Conclusion.** This case highlights the importance of careful preoperative planning and a personalised approach to ensure the safety of paediatric patients with multiple anaesthetic drug allergies. Even routinely used agents may pose a significant risk, making familiarity with alternative pharmacological options essential for safe perioperative management.

Keywords: Anesthesia, General; Pediatric Anesthesia; Child; Drug Hypersensitivity; Allergy and Immunology; Perioperative Care; Drug-Related Side Effects and Adverse Reactions; Patient Care Planning

Introduction

Drug hypersensitivity reactions represent a major safety concern in anaesthetic practice. During anaesthesia, multiple drugs are administered over a short period, requiring careful monitoring given the risk of hypersensitivity reactions [1]. Although severe anaphylactic reactions are relatively rare, they can have serious and potentially life-threatening consequences, particularly in the perioperative period [2].

In paediatric anaesthesia, the risk of allergic reactions is further increased by the limited ability to

Sažetak

Uvod. Reakcije preosetljivosti na lekove predstavljaju jedan od najznačajnijih bezbednosnih problema u anesteziološkoj praksi, posebno u pedijatrijskoj anesteziji, gde je prepoznavanje otežano, a kliničko pogoršanje brzo. **Prikaz slučaja.** U radu je prikazan slučaj deteta, uzrasta pet godina, koje je tokom prethodne opšte anestezije razvilo alergijsku reakciju. Na osnovu dokazanog alergološkog ispitivanja sprovedeno je individualno planiranje anestezije i izbor alternativnih anestetičkih lekova. Anestezija je protekla bez neželjenih reakcija. **Zaključak.** Ovaj slučaj ističe važnost preoperativnog planiranja i personalizovanog pristupa kako bi se osigurala bezbednost pedijatrijskih pacijenata sa višestrukim alergijama na anestetičke lekove. Čak i rutinski korišćeni agensi mogu predstavljati značajan rizik, što čini poznavanje alternativnih farmakoloških opcija neophodnim za bezbedno perioperativno lečenje.

Gljučne reči: opšta anestezija; pedijatrijska anestezija; dete; preosetljivost na lekove; alergije i imunologija; perioperativna nega; neželjena dejstva lekova; personalizovani pristup pacijentu

recognise symptoms promptly and by the potential for rapid clinical deterioration. The most common triggers are neuromuscular blocking agents, antibiotics, and latex, while reactions to drugs used for pre-medication and induction are less frequently reported in the literature [1].

Although hypersensitivity reactions to anaesthetic drugs are extremely rare, when they do occur they can significantly limit the use of standard anaesthetic protocols and necessitate an individualised approach [2].

Midazolam, rocuronium, and atropine are widely used in routine paediatric anaesthetic practice: they

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enable safe premedication and easy separation from parents, and provide airway management, muscle relaxation, and stabilisation of autonomic responses.

In this report, we present the case of a paediatric patient scheduled for surgical ear tube insertion who had experienced an allergic reaction during a previous induction of general anaesthesia. Subsequent allergy testing confirmed allergies to midazolam, atropine, and rocuronium, posing a significant challenge for planning the subsequent anaesthetic management.

Case Report

A 5-year-old boy, weighing 15 kg, was scheduled for surgical ear tube insertion. His medical history was notable for developmental dysphasia and a severe anaphylactic reaction during a previous otorhinolaryngological procedure under general anaesthesia, two years earlier. On that occasion, premedication with midazolam and atropine was followed by sudden agitation, erythema, and dyspnoea. Due to rapid clinical deterioration, general anaesthesia was urgently induced, during which bronchospasm occurred. Subsequent allergological evaluation, including skin prick testing, confirmed hypersensitivity to midazolam, atropine, and rocuronium.

The anaesthesiology team performed a carried out preoperative assessment. A thorough review of the patient's medical records, including his documented and allergologically confirmed drug allergies, informed the development of an individualised anaesthetic plan using alternative drugs to ensure optimal perioperative safety. Informed consent for publication of this study was obtained from the parents.

In line with current recommendations for patients at increased risk of hypersensitivity reactions, corticosteroid premedication was administered. On the day of surgery, prophylactic methylprednisolone was given at a dose of 1 mg/kg. Because of the confirmed midazolam allergy, nebulised dexmedetomidine at 2 µg/kg was administered by inhalation for premedication instead of a benzodiazepine.

Thirty minutes after premedication, the patient was transferred to the operating room. Given the nature of the planned procedure (ear tube insertion), it was decided to proceed with balanced general anaesthesia without endotracheal intubation, using a supraglottic airway device (I-gel) to maintain the airway. In accordance with the anaesthetic plan, anaesthesia was induced with propofol 3 mg/kg and fentanyl 2 µg/kg, consistent with standard paediatric dosing. Given the confirmed rocuronium allergy and the short duration of the procedure, neuromuscular blocking agents were not administered. Anaesthesia was maintained

with sevoflurane, with a slightly increased minimum alveolar concentration (MAC) to ensure adequate depth of anaesthesia. Throughout the procedure, vital parameters (heart rate, oxygen saturation, and end-tidal CO₂) remained stable and within age-appropriate physiological ranges. Anaesthesia was discontinued at the end of the procedure. Ondansetron 0.1 mg/kg was administered for prophylaxis against postoperative nausea and vomiting, together with paracetamol 15 mg/kg for postoperative analgesia. The patient awoke from anaesthesia with spontaneous, adequate breathing and stable blood pressure and heart rate. Later that evening, following a repeat clinical assessment, he was discharged home in good general condition, with recommendations for continued follow-up.

Discussion

Perioperative anaphylaxis is a life-threatening condition with an estimated prevalence of 1:3,500 to 1:20,000 procedures and a mortality rate of up to 9%. Clinical presentation includes signs such as skin rash, urticaria, angioedema, bronchospasm, tachycardia, bradycardia, and hypotension [3].

Muscle relaxants are the most common causes (30-70%), followed by antibiotics (8%), chlorhexidine (5%), latex (6%) and others [4,5].

This case illustrates the challenges in the anaesthetic management of a paediatric patient with multiple drug allergies confirmed by allergy testing. Hypersensitivity reactions to midazolam, atropine, and neuromuscular blocking agents are rare. Still, they present a significant clinical challenge, particularly in children, in whom these drugs are frequently part of standard anaesthetic protocols.

Although midazolam is generally regarded as a safe, well-tolerated drug, in some patients it can induce severe adverse reactions, including respiratory depression or arrest and anaphylactoid or anaphylactic reactions [6]. In this patient, the confirmed midazolam allergy required an alternative premedication agent. Dexmedetomidine has emerged as a useful alternative sedative agent in paediatric anaesthesia, as it provides effective sedation with minimal respiratory depression, which may be particularly valuable in patients with a history of perioperative hypersensitivity reactions [7,8].

Neuromuscular blocking agents are among the most common triggers of perioperative anaphylactic reactions, with rocuronium one of the most frequently reported agents [9]. Given the confirmed rocuronium allergy and the short duration of the planned surgical procedure, neuromuscular blockers were avoided, allowing safe anaesthetic management without complications. Where their use is necessary,

cisatracurium may be considered the agent of choice, as it has been reported to carry a lower risk of hypersensitivity reactions and minimal cross-reactivity in patients with confirmed rocuronium allergy [9,10].

Atropine is widely used as an anticholinergic agent in paediatric anaesthesia, owing to the higher incidence of bradycardia in children. Although atropine allergy is extremely rare and not widely recognised among anaesthetists, it is important to be aware of its existence [11,12]. Atropine was therefore omitted from the anaesthetic plan in this case.

Conclusion

This case underscores the critical role of thorough preoperative anaesthetic assessment and detailed history-taking in children with known drug allergies. It also highlights the importance of familiarity with alternative pharmacological options to enable safe anaesthetic management and reduce the risk of perioperative hypersensitivity reactions.

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