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Anaphylaxisduring skin test with vecuronium

To the Editor,

During perioperative periods anaphylactic reactions are not uncommon events. Their prevalence is estimated to be 1 in every 10,000–20,000 anaesthetic cases.[1] Neuromuscular blocking drugs (NMBD) are the most causative agents in such events, contributing to 69.2% of the cases.[2] Natural rubber latex (NRL, or cis-1,4-polyisoprene) was the second most implicated agent. Antibiotics and anaesthesia induction drugs are the other drugs leading to anaphylaxis. The evaluation is based on serum tryptase levels, skin prick and intradermal tests, basophil activation assays and drug specific IgE levels. Although skin tests with anaesthetic agents are known to be safe and feasible, we have reported a boy with an anaphylactic reaction to vecuronium during the intradermal test.

We were consulted at the paediatric surgery about an 18-month-old boy with Hirschsprung disease for oxygen desaturation (90%) just a few minutes after induction of anaesthesia. This was the second operation that he had undergone for his disease and propofol 20 mg iv, vecuronium 1 mg iv and sevoflurane were administered. Ampicillin had been administered intravenously, 20 min before the operation. There was no other reason for considering anaphylaxis such as hypotension (his blood pressure was 95/60 mmHg), skin eruption, angio-oedema or gastrointestinal symptoms. He had no family or personal history of allergy. Serum tryptase levels were within normal ranges (8.4 μg/L) (normal range: 3.5–11.4 μg/L). The specific IgE of latex, penicillin, and egg white were negative. Six weeks later he was referred to our allergy department in order to detect the possible causes of intraoperative anaphylaxis and to determine potentially safe alternative drugs (for anaesthetics) for future surgery. The child underwent skin prick tests with common allergens then prick and intradermal tests for penicillin and ampicillin. Skin tests were interpreted as being positive if a wheal larger than 3 mm in diameter accompanied by erythema was present 20 min later. Histamine hydrochloride was used as the positive control and 0.9% sodium chloride as the negative control. Skin prick testing only gave negative results. Then, we performed an oral provocation test with ampicillin, giving a total dose of 500 mg by gradually increasing the dose (5–250 mg). There was no reaction. One week later we performed a prick test with vecuronium. Again this proved to be negative. Following this, an intradermal test by 1/10 concentration (400 μg/mL) of vecuronium was performed on the forearm. After 5 min, he became agitated; he had angio-oedema around his eyes and also hoarseness. Then, he had respiratory failure with an oxygen saturation of 88%. His blood pressure was 60/30 mmHg. The patient responded positively to an intradermal test resulting in doubling of the size of the injection wheal. Epinephrine 0.01 mg/kg was administered intra-muscularly. Intravenous steroid 1 mg/kg and 100% oxygen were administered. Intravenous fluid was infused continuously to maintain his blood pressure. His blood pressure increased to 80/40 mmHg and his oxygen saturation to 99% but his respiratory distress continued. Beta-2 agonist was administered via a nebuliser. His serum tryptase level was at the upper limit of normal (11.5 μg/L). After 1 h his symptoms reduced and resolved completely in 2 h. After 24 h he was discharged.

Anaphylaxis is an acute systemic hypersensitivity reaction involving several organ systems, particularly the skin, respiratory tract, gastrointestinal tract and the cardiovascular system. During surgery, early cutaneous signs of anaphylaxis are often unrecognised because patients are unconscious and they are under drapes. Therefore, bronchospasm and cardiovascular collapse are the first recognisable signs of anaphylaxis. A survey of anaphylaxis when under anaesthesia demonstrated that cardiovascular symptoms (73.6%), cutaneous symptoms (69.6%), and bronchospasm (44.2%) were the most common clinical features.[2] During this operation only oxygen desaturation occurred. There were no cardiovascular or cutaneous symptoms. However, during prick testing he had angio-oedema and although there were no signs of bronchospasm he had symptoms of laryngeal obstruction and hypotension.

Serum tryptase is a mast cell protease that is increased in cases of anaphylaxis and can be measured in serum and plasma 30 min after the first signs of anaphylaxis and correlate with the presence of hypotension. The half-life of tryptase is 2 h and the levels gradually decrease over time. Tryptase may not be increased in the absence of hypotension.[3] In our case, during anaesthesia serum tryptase levels did not increase as he had no hypotension and also during prick testing his serum tryptase level was at the upper limit. The absence of serum tryptase does not eliminate an anaphylactic reaction since there have been reports of anaphylaxis with positive tests for IgE antibodies in the setting of an absence of serum tryptase.

The evaluation of anaphylaxis is based on serum tryptase levels, skin prick and intradermal tests, basophil activation assays and drug specific IgE levels. The specificity and sensitivity of the skin tests to muscle relaxants is greater than

95%. The overall concordance of prick testing and intradermal test is 97%. Both types of tests can be used for such diagnosis.[4] A study from France, including a total number of 68 children who had hypersensitivity reactions to general anaesthesia, reported that 31 (60.8%) of the children had IgE-mediated anaphylaxis for NMBD, most with vecuronium. They reported no systemic reactions during tests and suggested that skin tests with anaesthetic agents are feasible and safe in children and improve the safety of subsequent anaesthetic procedures.[5] Farrell et al.,[6] reported a case of anaphylactoid reaction during intradermal testing with vecuronium when used with a higher than recommended test dose. In our case, desaturation was the only finding during anaesthesia whereas he had hypotension, angio-oedema and respiratory difficulties during testing. This could be explained by repetitive doses, which, although they were minimal, can remind the body about its hypersensitivity to the drug and induce more severe symptoms of anaphylaxis. To the best of our knowledge the age of our case was the youngest child ever to experience anaphylaxis during intradermal testing with vecuronium in the English literature.

In conclusion, although prick tests and intradermal tests are principally safe, they should be performed only by trained physicians in a setting with adequate resuscitation equipment, due to the risk of a systemic reaction. Moreover, we suggest performing prick and intradermal tests even if the patient has a strong history of anaphylaxis.

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The extended family and the poor asthma control in children. A look at family functioning, authority and hierarchies

To the Editor,

Despite adequate administration of daily controller medication, the number of children with uncontrolled asthma is considerably high and reduced quality of life is observed in both parents and children with poor control.[1] Multiple psychosocial problems can contribute to poor asthma control in a similar proportion to poor treatment adherence.[2] From previous studies of psychosomatic families, it has been postulated that there are certain stereotypical types of organisation within them such as agglutination, reciprocal overprotection, rigidity and avoidance of conflict.[3] These types of family patterns are highly related to the development and maintenance of psychosomatic symptoms which play an important role in the homeostasis of the family.[4]

From a systemic perspective, the family becomes the protagonist in the symptoms of the indicated patient (scapegoat). The objective of the present study was to identify behavioural patterns within the family unit with respect to the asthmatic patient with uncontrolled asthma and living in extensive families, putting emphasis on authority and hierarchy in such families.

Seven extensive families with a child between the ages of 6 and 11 years old with uncontrolled asthma, confirmed when 19 or less points were reached by children after application of the asthma control test.[5] Children's data were obtained from the database of the Institute for Scientific Research in Family, Allergy and Immunology in Morelia, Mexico, in May, 2008. Ten extensive families with a child with uncontrolled asthma were initially considered to be included in the study, but only seven of them finally decided to participate in it.

Family functioning was evaluated in nine different areas with Dr. Emma Espejel Acco's Scale of Family Functioning[6] as a reference base. This scale was chosen because it could attain the desired objective and because it was standardised for the Mexican population with a sensibility of 0.91 to discriminate between dysfunctional and functional families. This instrument is also 0.94 accurate when applied by our team of psychologists who are trained in their application and interpretation. Furthermore, a questionnaire was used to study clinical and demographical aspects in the sample population.