

IgE-Mediated Reaction to Local Anaesthetics

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ABSTRACT

Local anaesthetics (LAs) are essential agents in daily practices of dentistry, minor surgery and dermatology. Although they have an impressive history of safety and efficacy, LAs also have the potential to produce adverse events, which are mainly of non-immune nature. The true IgE-mediated allergies are quite rare, but are more considerable in terms of ability to cause life-threatening outcomes. In this report, we present a case of IgE-mediated systemic reaction to LAs occurring during epidural anaesthesia for Cesarean section.

Key words: Local anaesthetics. Amide. Allergy. Labor. Epidural anaesthesia.

INTRODUCTION

Local anaesthetics (LAs) are essential drugs in many invasive procedures especially in daily practices of dentistry, minor surgery or dermatology. This class of medicine has an impressive history of safety and efficacy, but all LAs have the potential to produce adverse effects. These events are mostly related with direct effects of the ingredients and preservers, namely the non-immune reactions. The true IgE-mediated allergies are quite rare. However, allergic reactions to LAs are more considerable in terms of being potential to cause fatal consequences.¹ Articaine is an amide LA and are known to be safe and effective.² It may be considered as a right choice when selecting an alternative LA with previous tests results.

In this report, we describe a case of systemic reaction to LAs, which happened during epidural anaesthesia for cesarean section (C-section).

CASE REPORT

A 23 years old primipara was planned for C-section under epidural anaesthesia. The target area was numbed with a local anaesthetic (40 mg of 2% Prilocaine) to minimize the pain from the actual epidural needle going in. A 15-gauge Tuohy epidural needle was inserted into epidural space and test dose (60 mg of Lidocaine) was injected. An epidural catheter was threaded through the needle into the epidural space. The needle was carefully removed and as the last 75 mg of Bupivacaine were given to carry out epidural anaesthesia.

Shortly after the operation began, the patient expressed an extensive itching sense. Physical examination revealed widespread urticarial lesions on the face, trunk, and extremities; and mild angioedema on eyelids, however, pulse, blood pressure and respiratory rate were all in normal range. Antihistamine (20 mg of Diphenhydramine) and corticosteroid (60 mg of Methylprednisolone) was given intravenously and C-section was continued. After the C-section was completed, an allergist was consulted.

The examination of the patient revealed urticarial plaques in several sizes throughout her body. Intensive care staff was warned about the late or multiphase allergic reactions and starting of regular antihistamine treatment for 7 days. After 6 weeks, the patient was re-evaluated at the allergy clinic to find out the cause of the reaction.

The patient had no history of allergic disease. In a detailed history, an earlier seamless use of a LA in a dental procedure was noted. Unfortunately the name of administered LA could not be determined. Routine laboratory tests including whole blood count, serum biochemistry and urine analysis were in normal range. Skin prick tests with inhalant and food allergens, and natural rubber latex allergen were resulted negative.

As the next step, allergy skin tests with LAs that were used during the patient's epidural anaesthesia were carried out. An informed consent was taken from the patient after explaining the test procedures.

Epidermal (prick) and intradermal skin tests with each LA were performed. Epidermal test was performed using a disposable blood lancet and the reactions were recorded at the 15th minute. Reaction with a wheal diameter greater than 3 mm with surrounding erythema was considered as positive, if the positive control (histamine) was positive and negative control (saline) was negative. Any wheal without erythema was accepted as an irritant response and disqualified. If the epidermal test is negative, intradermal test was performed. Cutaneous reactions were evaluated after

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Table I: Tested agents with allergy skin test and results.

Tested drugs and control solutions	After observation period, the next step performed if the test was negative				
	Epidermal test (undiluted)	Intradermal test (1/100 dilution)	Intradermal test (1/10 dilution)	Intradermal test (undiluted)	Provocation with 1 ml of undiluted
Prilocaine (amide)	negative	negative	positive	NA	NA
Lidocaine (amide)	negative	negative	negative	positive	NA
Bupivacaine (amide)	negative	negative	negative	positive	NA
Negative control (saline)	negative	negative	negative	negative	NA
Positive control (histamine)	positive	positive	positive	positive	NA

NA = Not administered.

Provocation tests with 1 ml of lidocaine and bupivacaine were not carried out because of the risk of systemic reaction.

20 minutes. A wheal greater than negative control with a surrounding erythema was accepted as positive.

Skin tests procedure and their results with suspected LAs are summarized in Table I.

Approximately 5 months after cesarean section, the patient needed dental treatment and she was referred to the allergy clinic to select the appropriate LA.

Testing as described above and resulted in negative. So Articaine was suggested as suitable LA for dental procedure. The dental surgery was performed without any complication.

DISCUSSION

Adverse reaction to a LA is a common occasion and well known by physicians and even by patients. However, most of these reactions are frequently ascribed to psychogenic, idiosyncratic or pharmacologic effects of its ingredients mainly vasoconstrictor agent (Epinephrine)^{1,3} Adverse reactions are commonly attributed to the patient being allergic to LAs. Therefore, this situation causes serious hesitations when an LA is needed again.

Fortunately, true allergy to LAs is very rare. IgE-mediated urticaria, angioedema or anaphylaxis are less than 1% of adverse reactions to local anaesthetics.^{1,4}

Immune mediated reactions to LAs can also be identified by skin pricks or intradermal tests. In patients with history of reaction to LAs, or without a certain history, epidermal and intradermal skin testing may provide useful information, in particular to determine a safe agent for subsequent use.⁵

Basophile histamine release test or specific IgE determination for indicated to type 1 hypersensitivity reaction

was not performed because of positive intra-dermal test results of Lidocaine and Bupivacaine. It could have led to serious systemic effects.

False positive result is an important limitation of allergy testing with LAs and the test must be evaluated with this limitation in mind.⁵ False positivity may occur especially when a high concentration of undiluted LA is injected intradermally, probably due to the irritant effect of the LA. These reactions can be minimized by using negative control solution and by using a 1:100 concentration of LA in the initial intradermal phase of skin testing. Some recommend intradermal testing with LA diluted to 1:100 only, to exclude irritant reactions effectively.⁵ Articaine is a good alternative to start with in case of known allergy to LAs as proved in this case.

Albeit the vast majority of adverse reactions to LAs occur via non-immunologic means, evaluation of each patient who gives a history of reaction to a LA, under the supervision of the allergy consultant would be clinically helpful. This is the only way to predict and prevent an allergic reaction including anaphylaxis.

REFERENCES

1. Berkun Y, Ben-Zvi A, Levy Y, Galili D, Shalit M. Evaluation of adverse reactions to local anaesthetics: experience with 236 patients. *Ann Allergy Asthma Immunol* 2003; **91**:342-5.
2. Katyal V. The efficacy and safety of articaine versus lignocaine in dental treatments: a meta-analysis. *J Dent* 2010; **38**:307-17.
3. Caron AB. Allergy to multiple local anaesthetics. *Allergy Asthma Proc* 2007; **28**:600-1.
4. Khan DA, Solensky R. Drug allergy. *J Allergy Clin Immunol* 2010; **125**:126-37.
5. Thyssen JP, Menné T, Elberling J, Plaschke P, Johansen JD. Hypersensitivity to local anaesthetics--update and proposal of evaluation algorithm. *Contact Dermatitis* 2008; **59**:69-78.

