Adverse effects of lignocaine local anesthetic drug
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INTRODUCTION
Local anesthetic administration is a common procedure in dental practice. Serious complications can be controlled when the drugs are administered carefully and within the required dosage range. When there is an adverse reaction, it is usually of reversible and temporary nature, though there is also a risk for a more serious response. Pallor, precipitations, and dizziness are some common adverse reactions reported in the past studies. There is a significant relationship between anxiety, gender, injection technique, and procedure with a higher incidence of adverse reaction. The purpose of this study is to explain that the adverse reaction provoked during a dental procedure is not specifically because of the local anesthetic drug.

LOCAL ANESTHETICS
Local anesthetics have proven to be among the safest of drugs in dental practice, as evidenced by their low incidence of adverse drug reactions.¹ These anesthetics are classified into two basic chemical groups, esters or amides, according to the linkage of intermediate connecting chain. The ester-type anesthetics, represented by procaine, are responsible for most sensitization reaction due to a highly antigenic agent p-aminobenzoic acid, a common breakdown product of many anesthetics which causes cross-allergen city.

On the other hand, the breakdown product of amide local anesthetic does not include a basic amine in the para position as seen with p-aminobenzoic acid. Hence the sensitization reaction that occurs with amide local anesthetic is quite rare.²

ADVERSE EFFECTS
Local anesthetics should be considered relatively safe, but with the high number of injections given yearly, adverse reactions are seen.³ There are three types of adverse reactions seen with local anesthetics. They are psychogenic reactions, allergic reactions, and toxicity.

Psychogenic Reactions
Anxiety-induced events are most common adverse reactions associated with local anesthetics in dentistry. They manifest in numerous ways, the most common of which is syncope. In addition, there are variety of symptoms including hyperventilation, nausea, and vomiting. These reactions are often misdiagnosed as allergic reaction and may also mimic them, with signs such as urticarial, edema, and bronchospasm.⁴

ABSTRACT
Allergic reaction due to lignocaine and other amide anesthetic agents used in dental practice is very rare, and it is suggested as a cause when adverse reactions to dental injections occur. Psychogenic reactions are the main causes of these events, of which some can be alarming. A minute proportion of adverse responses can be attributed to intravascular injections. These adverse reactions can be controlled and avoided if proper technique is handled during the procedure.

KEY WORDS: Allergy, Hypersensitivity, Lignocaine, Local anaesthesia

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Allergic Reactions

Patient reports of allergic reactions to local anesthetics are common, but the investigations show that most of them are of psychogenic origin. True allergy to an amide is exceedingly rare, whereas the ester procaine is somewhat more allergenic due to a product named p-aminobenzoic acid, which is yielded by the metabolism of ester compounds.

Other allergens may be methylparabens which are preservatives necessary for multidose vials and were present in dental cartridges in the past. Metabisulfite is another compound that is commonly used along with vasoconstrictors like adrenaline which can cause allergy.[5]

Toxicity

The toxicity of local anesthetics is a function of systemic absorption. High blood levels of the drug may be due to repeated injections or from single inadvertent intravascular administration. Predisposition to toxic effects in any given patient depends on several factors such as site of administration, speed of injection, and presence of vasoconstrictor. The dose of the drug administered also plays a vital role in cases of pediatric patients, and it is important to note how little the anesthetic should be given to the child.[6]

PATHOGENESIS OF ALLERGIC REACTIONS

Allergic reactions are immune mediated, generally triggered by lymphocytes. Based on distinct pathological mechanisms, allergic reactions are categorized from I to IV by Gell and Coombs.[7]

Type I reactions are mediated by antibodies derived from immunoglobulin E (IgE). The anaphylactic reactions are most feared because of its rapid onset and potentially fatal consequences which are characterized by circulatory collapse, airway obstruction, and bronchospasm due to release of chemical mediators such as histamine, serotonin, and bradykinin.[8]

Type II reactions are mediated by antibodies from IgE, immunoglobulin M (IgM), or both. Local anesthetics could theoretically elicit this type of reaction by interacting with complement to create a cytotoxic response such as cell injury and destruction of erythrocytes, leukocytes, and platelets.[9]

Type III immune responses usually affect vascular or connective tissues resulting in edema or inflammation. These reactions may be Immunoglogulin G(IgG) or IgM mediated immune responses.[10]

Type IV immune responses are local and cell-mediated responses, with contact dermatitis the most common example. Type I and IV responses are involved in majority of abnormal immune reactions elicited by local anesthetics.[11]

PATIENT ASSESSMENT AND INCIDENCE OF DRUG ALLERGY

If a patient reports an allergic reaction, this does not necessarily preclude the use of the particular drug or drug class in question. It is not uncommon for patients to label any adverse drug experience as an allergic reaction.[12-14]

A patient’s claim for allergy to local anesthetics has given a paramount importance of these agents in dental practice. Although the actual incidence of confirmed allergy to local anesthetics is extremely low (<1%), most of the adverse reactions involving local anesthetic are mistaken as allergy.[15-17] Patients with suspected allergies can be tested under controlled conditions to determine if an allergy exists or to find a local anesthetic that can be safely administered.[18]

CONCLUSION

Adverse reactions to dental local anesthetic injections are more common, but the majorities are transient and may go unnoticed by the dental surgeon. The most frequent causes of adverse effects of local anesthetics are driven by anxiety (psychogenic). Physicians must have better understanding of frequency of such reactions, as well as testing to establish a proper diagnosis so that appropriate management or referral of suspected allergy of the patients can be treated.

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