



ISSN: 0975-766X
CODEN: IJPTFI
Research Article

Available Online through
www.ijptonline.com

AWARENESS OF ANAPHYLAXIS REACTION TO LOCAL ANAESTHETIC DRUGS AMONG DENTAL STUDENTS- A CROSS SECTIONAL STUDY

S. Vaishali^{1*}, Anitha Roy^{2**}

*Bachelor of Dental Surgery, Saveetha Dental College and Hospitals, Chennai, India.

**Faculty of Pharmacology, Saveetha Dental College and Hospitals, Chennai, India.

[Email: vaishudevasri1348@gmail.com](mailto:vaishudevasri1348@gmail.com)

Received on: 14-02-2017

Accepted on: 12-03-2017

Abstract:

Aim: The aim of the study was to determine the knowledge of dental students about signs, symptoms and management of anaphylaxis reaction to local anaesthetic drugs.

Materials and Method: The study was designed with a pretested interviewer questionnaire containing 14 questions related to anaphylaxis to local anaesthesia in a private dental college. The interns and the postgraduates were randomly selected to complete the questionnaire.

Results: Although all attendants knew one or more symptoms and signs of anaphylaxis but none of them marked all options related to anaphylaxis. The recommended practise of administration of epinephrine using the IM route was similar to the others studies. However, some dentists did not know the importance of this.

Conclusion: The oral cavity is always prone to exposure to variety of sensitizing agents. Anaphylaxis is one of the rare clinical effects specifically related to local anaesthesia leading to morbidity and mortality. Adverse reactions to medications which are administered during treatment in dental practice is a source of worry. There is very less literature determining the knowledge of dental students about anaphylaxis reaction to local anaesthesia.

Keywords: Anaphylaxis, Local Anaesthesia, epinephrine.

Introduction:

The oral cavity is always prone to exposure to a variety of potentially sensitizing substances or irritants. There is a high chance for different substances like topical medications, synthetic resins, disinfecting agents, metals, etc. to come into contact with the oral mucosa during routine dental treatment [1]. Based on epidemiology studies, the drug which induce anaphylaxis shock has increased in the recent years [2,3]. Anaphylaxis during anaesthesia is a rare phenomenon, but may have life threatening consequences when encountered and if not managed correctly. The

worst manifestations are cardiovascular collapse, bronchospasm and laryngeal oedema [4,5]. The diagnosis of anaphylaxis is based primarily on clinical criteria and is valid even if the results of laboratory tests, such as serum total tryptase levels, are within normal limits[5].Adverse reactions to medications which are prescribed to patients or administered during treatment in dental practice is a source of worry. Adverse drug reactions are classified into type A or type B conventionally. Type A reactions are common and caused by the pharmacological effects of drugs resulting in nausea, tachycardia, etc. Type B reactions seldom occur and are considered unpredictable. They may also occur due to pseudo-allergies [6]. Adverse reactions occur due to either contact allergies and a very small percentage of the cases show reactions after administration of Local anaesthesia, yet other types of allergy like, immediate type allergy to these agents is quite uncommon. Patients with symptoms or signs of stomatitis, oral lichenoid lesions, lip and facial swelling may relate their problems to dental procedures or to the use of dental products[7]. Moreover, the practitioners are alerted to the crisis only when it is severe enough to cause rapid cardiovascular and respiratory compromise, leaving little time to manage the crisis. Early signs and mild symptoms remain virtually unrecognised as, or when patients are unconscious and covered with surgical drapes, preventing observation of the initial skin manifestations. Then, the severity of the reaction may be underestimated by the practitioner [8].Conversely, hypotension and difficulty in ventilation may have other more common causes that need to be excluded first.Any drug administered can potentially produce life-threatening immune mediated hypersensitivity reactions[9].Therefore, if a drug-induced allergic disorder is suspected, consultation with an allergy specialist experienced in the identification, diagnosis and management of drug allergy is recommended[10].A careful and specific history of adverse or allergic drug reactions and subsequent avoidance of these drugs are the safest way to prevent peri-operative anaphylaxis. So this study aims at assessing the knowledge of dental students regarding the anaphylaxis reaction to local anaesthetic drugs.

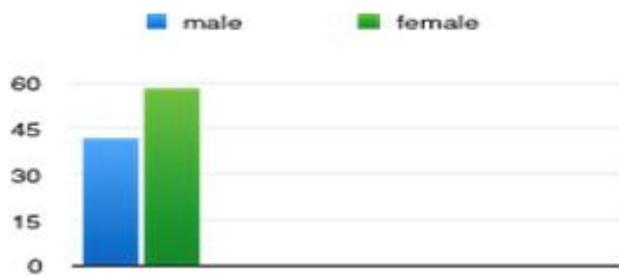
Materials and Method:

100 dental students out of which 73 were undergraduates and 27 were postgraduates from a private Dental College were approached. The questionnaires were self-formulated and was delivered by hand and collected on completion. The medium of answering the questionnaires was English. All the responses of the questionnaires were kept anonymous. The questions were framed in order to assess the awareness of dental students on the effect of anaphylaxis to local anaesthetic drugs. The data collected was entered in Microsoft excel sheet and the results were tabulated and described in and bar graphs.

Questionnaire Design:

The questionnaires were self-formulated and were designed to study the awareness of dental students on the effect of anaphylaxis to local anaesthetic drugs. The questions were related to clinical conditions and practice. Some of the questions required their respondents to choose multiple options which applied to their condition. Some of the questions were of yes or no type.

Results: The data was entered in Microsoft excel and the results were tabulated and described in pie chart.



1: Age.



Fig 2: Educational qualification

Fig 3: clinical experience

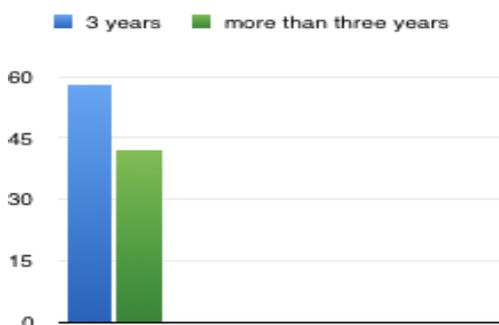


Fig 5: commonly used brand of L.A

Fig 4: most commonly used L.A

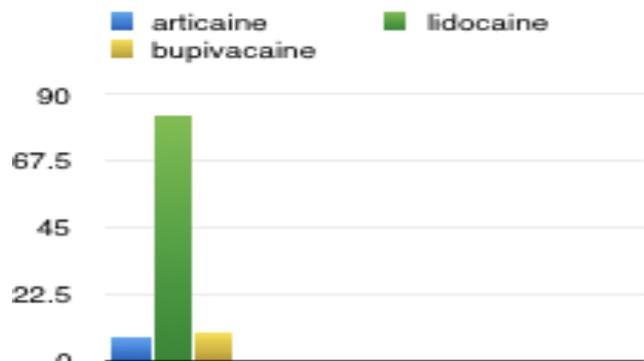


Fig 6: asking the patient for drug allergy

Before the start of treatment

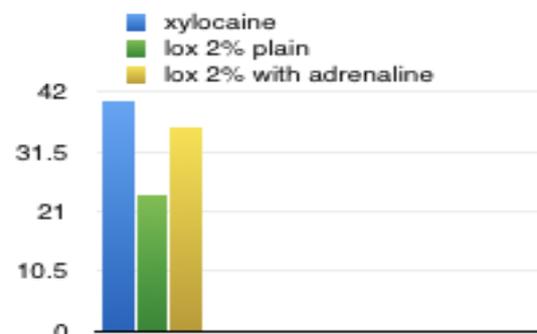
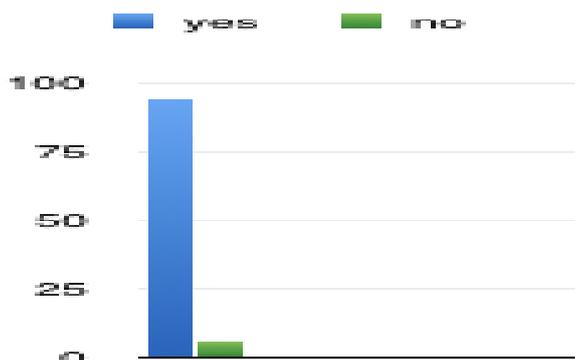


Fig 7: behaviour of dental student in seeing a patient with L.Aallergy

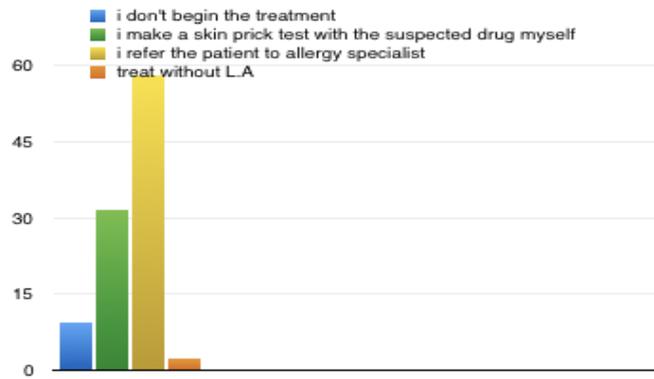


Fig 8: seen patient with systemic adverse reaction due to L.A

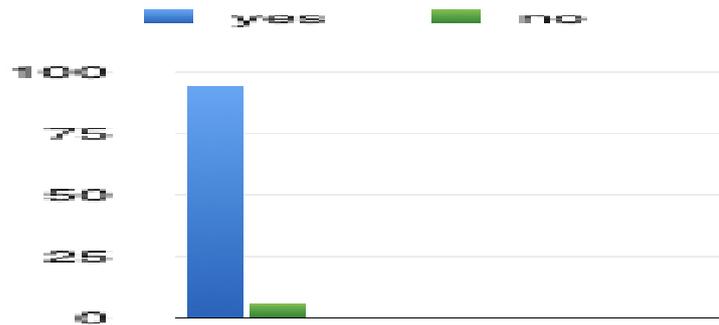


Fig 9: symptoms encountered

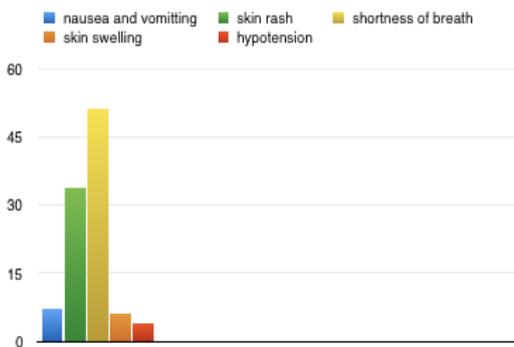


Fig 10: first choice drug in management

Of anaphylaxis

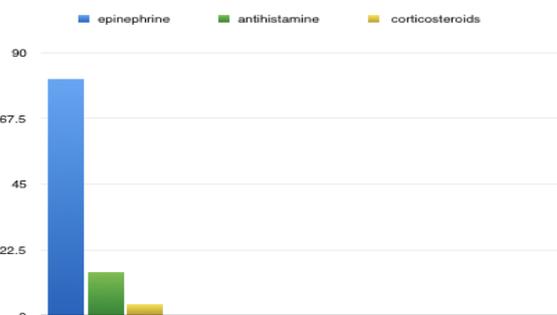


Fig 11: intensity of reaction.

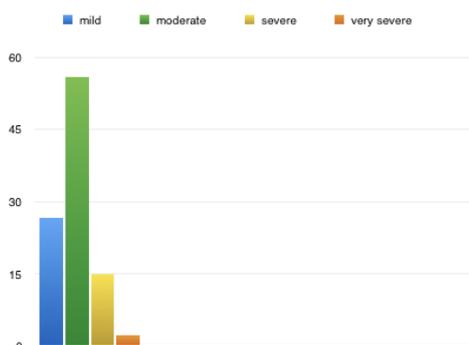
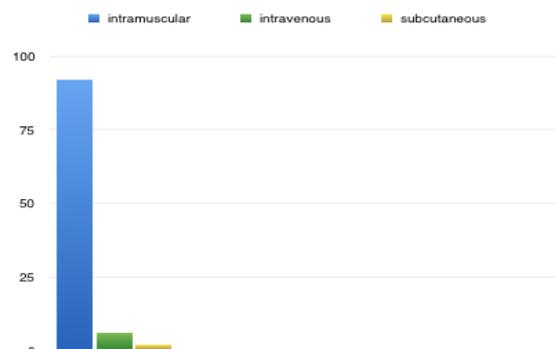


Fig 12: route of epinephrine administration



Discussion:

Drug allergy is one type of unpredictable adverse drug reaction (ADRs) that encompasses a spectrum of immunologically-mediated hypersensitivity reactions with varying mechanisms and clinical presentations. It accounts for approximately 5-10% of all ADRs [11,12]. Most people who have a genuine allergic reaction to local anesthetics are not allergic to the actual anesthetic agent (or "caine") [13]. Anaphylaxis is one of the most urgent clinical pictures in daily medical practice. Manifestations from the skin to the cardiovascular and respiratory systems are present simultaneously in approximately 70% of patients. Anaphylaxis should be diagnosed and treated immediately [14]. Since anaphylaxis may also be encountered by dentists, although not common-in their routine practice, they should also be aware of the symptoms and signs of anaphylaxis, and should treat the severe reactions in the light of recent advances [15]. The most effective strategy for the management of drug allergy is avoidance or discontinuation of the offending drug. When available, alternative medications with unrelated chemical structures should be substituted. Cross-reactivity amongst drugs should be taken into consideration when choosing alternative agents. In the event of an anaphylaxis episode, the treatment of choice is epinephrine administered by intramuscular injection into the lateral thigh because of the greater vascularity of the muscles which facilitates rapid achievement of epinephrine in peripheral blood[16]. Epinephrine, antihistamines and corticosteroids are not expensive and so should be kept in all medical centre[17].82.6% of the dental students used lidocaine as the local anaesthetic. About 94.1% of the dental students asked their patients for drug allergy before starting their treatment. This shows that these students were well trained and are concerned about their patient. 58.1% of the dental students refer their patient to an allergy specialist in case they encounter their patients' with L.A allergy, which is actually good. But in case of emergency, the dental students should get to know how to treat such patients instead of referring them to an allergy specialist.Although everyone were aware of one or more signs and symptoms of anaphylaxis reaction to local anaesthetic drug, but none of them knew all the signs and symptoms of anaphylaxis. So a little more education in this regard will help the students to tackle any kind of patient presenting with different signs and symptoms. About 85% of the students chose epinephrine as the first choice in managing anaphylaxis and about 81% have them in their dental office which is good as they can be administered to patients in case of emergency. Coming to the intensity of allergic reactions, 55.8% said that they have encountered moderate allergic reactions and the percentage of students having encountered severe allergic reactions is quite less, which is about 2.4%. Regarding the route of administration of epinephrine, about 92% of students chose intramuscular route, whereas some students don't know this and those intravenous and

subcutaneous. This is actually dangerous because epinephrine when given through intravenous or subcutaneous route will lead to severe vasoconstriction and results in severe cardiovascular consequences. Systemic corticosteroids and antihistamine may also be used to treat severe systemic reactions [18,19], but should never be given prior to or as a substitute for epinephrine in the treatment of anaphylaxis. In this study, some of the dentists use corticosteroids or antihistamine as the first choice of drug in the management of anaphylaxis[20].

Conclusion:

The oral cavity is always prone to exposure to variety of sensitizing agents. Anaphylaxis is one of the rare clinical effects specifically related to local anaesthesia leading to morbidity and mortality. Adverse reactions to medications which are administered during treatment in dental practice is a source of worry. Even though encountering anaphylaxis due to local anaesthetic drugs during dental procedures are very rare, but in case if it occurs it can be potentially life threatening. Many dental students don't know to treat their patients in case of emergency. This trend has increased in the recent years. So they have to be educated in order to be aware of the causes, signs, symptoms and treatment of anaphylaxis. So conducting awareness programmes in this regard will be useful.

References

1. Hauman CH, Love RM. Biocompatibility of dental materials used in contemporary endodontic therapy: a review. Part 1. Intracanal drugs and substances. *International endodontic journal*. 2003 Feb 1;36(2):75-85.
2. Worm M. [Epidemiology of anaphylaxis]. *Hautarzt*. 2013; 64:88-92.
3. Worm M, Babina M and Hompes S. Causes and risk factors for anaphylaxis. *J Dtsch Dermatol Ges*. 2013; 11:44-50.
4. Przybilla B, Ring J and Rueff F. [Anaphylaxis. Clinical manifestations and diagnosis]. *Hautarzt*. 2007; 58:1025-31.
5. Bartolomei FJ and McCarthy DJ. Anaphylaxis: mechanisms, manifestations, and management. *J Foot Surg*. 1984; 23:485-8.
6. Gawkrödger DJ. Investigation of reactions to dental materials. *British Journal of Dermatology*. 2005 Sep 1;153(3):479-85.
7. Ditrichova D, Kapralova S, Tichy M, Ticha V, Dobesova J, Justova E, Eber M, Pirek P. Oral lichenoid lesions and allergy to dental materials. *Biomedical Papers*. 2007 Dec 1;151(2):333-9.

8. Panjo GB, Crisafulli J, Calminiti L, Marseglia GL, Cardinale F, Paravati F, Caffarelli C. Peri-operative allergy: Therapy. *Int J Immunopath Phar* 2011;24(3):101-4.
9. Chiu CY, Lin TY, Hsia SH, Lai SH and Wong KS. Systemic anaphylaxis following local lidocaine administration during a dental procedure. *Pediatr Emerg Care*. 2004; 20:178-80.
10. Eskandari N, Nekourad M, Bastan R. The awareness of anaphylaxis reaction to local anesthesia in Dentistry. *Journal of Allergy and Asthma*. 2014 Jan 28;1(1):1.
11. Dewachter P, Mouton-Faivre C and Emala CW. Anaphylaxis and anesthesia: controversies and new insights. *Anesthesiology*. 2009; 111:1141-50.
12. Sicherer SH and Leung DY. Advances in allergic skin disease, anaphylaxis, and hypersensitivity reactions to foods, drugs, and insects in 2012. *J Allergy Clin Immunol*. 2013; 131:55-66.
13. Pavlidakey PG, Brodell EE and Helms SE. Diphenhydramine as an alternative local anesthetic agent. *J Clin Aesthet Dermatol*. 2009; 2:37-40.
14. Lieberman P. Anaphylaxis. *Med Clin North Am*. 2006; 90:77-95.
15. Sampson HA, Munoz-Furlong A, Campbell RL, Adkinson NF, Jr., Bock SA, Branum A, Brown SG, Camargo CA, Jr., Cydulka R and Galli SJ et al. Second symposium on the definition and management of anaphylaxis: summary report--second National Institute of Allergy and Infectious Disease/Food Allergy and Anaphylaxis Network symposium. *Ann Emerg Med*. 2006; 47:373-80.
16. Simons KJ and Simons FE. Epinephrine and its use in anaphylaxis: current issues. *Curr Opin Allergy Clin Immunol*. 2010; 10:354-61.
17. Anchor J and Settupane RA. Appropriate use of epinephrine in anaphylaxis. *Am J Emerg Med*. 2004; 22:488-90.
18. Sheikh A. Glucocorticosteroids for the treatment and prevention of anaphylaxis. *Curr Opin Allergy Clin Immunol*. 2013; 13:263-7.
19. Sheikh A, ten Broek V, Brown SG and Simons FE. H1-antihistamines for the treatment of anaphylaxis with and without shock. *Cochrane Database Syst Rev*. 2007; CD006160.
20. Cetinkaya F, Sezgin G and Aslan OM. Dentists' knowledge about anaphylaxis caused by local anaesthetics. *Allergol Immunopathol (Madr)*. 2011; 39:228-31.