

Knowledge of students about Local anaesthetics used during oral surgical procedures

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Abstract:

Aim:

The present study was undertaken to assess the knowledge of students about local anaesthetics during oral surgical procedures.

Materials and methods:

A questionnaire prepared based on 16 questions about local anaesthetics and are given to 61 students belong to 3rd year and 4th year dental (undergraduates) to assess their knowledge.

Conclusion:

In conclusion, the knowledge of undergraduate students concerning the local anaesthetics maximum-dose and dose calculations appears inadequate and worrying, especially since systemic toxicity of local anaesthetics is dose dependent. It is recommended that undergraduates should update themselves regarding the correct application of these critically important aspects in dentistry.

Keywords: local anaesthetics, complications, dosage

INTRODUCTION:

- A local anaesthetic (LA) is a drug that causes reversible local anaesthesia, generally for the aim of having a local analgesic effect, that is, inducing absence of pain sensation by inhibiting nerve conduction during a variety of dental procedures (1).
- Clinical local anaesthetics belong to one of two classes: aminoamide and aminoester local anaesthetics with short, intermediate or long acting action.
- The success of local anaesthetic administration depends on various factors like: site of administration, injection techniques, dosage and allergic complications. Studies showed that local anaesthetic failures are more likely to occur because of choosing improper site for injection and inappropriate techniques.
- The internal anatomy of maxillary and mandibular nerve are complex due to its multiple divisions local anaesthetics are given based on their ability of action for various surgical procedures.
- A 2% local anaesthetic means that 2 grams of the drug is dissolved in 100 ml of solution, i.e., 20 mg per ml. Local anaesthetics are preferred based on the severity of pain during oral surgical procedure and also for post-operative pain management.

METHODOLOGY:

A self-prepared questionnaire was distributed to undergraduate Dental students. A total of 100 forms were distributed. The questionnaire is comprising of 16 questions with multiple choice answers covering all the aspects of local anaesthetics, their ability of action, types, duration of onset, dosage and complications.

Questions consist of multiple choices and multiple sections with options for write in answers for appropriate. The survey was closed after 2 weeks. The data were compiled by a single assessor and analysed using the

statistical software SPSS. Only single unequivocal replies were included in calculated frequencies and percentages.

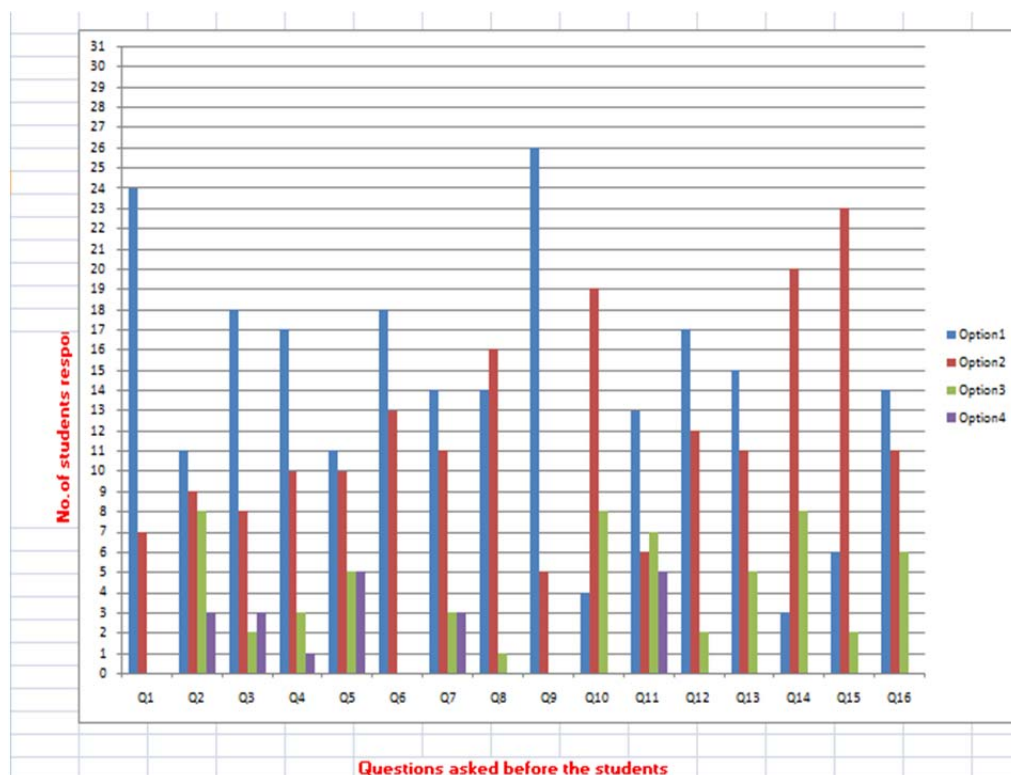
- 1) Most commonly used local anaesthetic agent in India?
 - a) Lignocaine.
 - b) Bupivacaine.
 - c) Ropivacaine.
 - d) Prilocaine
- 2) Commonly used anaesthetic agent in western countries in oral surgical procedures?
 - a) Articaine.
 - b) Prilocaine.
 - c) Lidocaine.
 - d) Bupivacaine
- 3) Anaesthetic agent used for long lasting effect
 - a) Bupivacaine.
 - b) Ropivacaine.
 - c) Articaine.
 - d) Prilocaine
- 4) Lignocaine is
 - a) Short acting.
 - b) Ultra short acting.
 - c) Moderately acting.
 - d) Long acting
- 5) Lignocaine is mostly preferred due to
 - a) Ease of Availability.
 - b) Cheaper.
 - c) Safer drug.
 - d) All of the above
- 6) Onset of action of lignocaine
 - a) 1-3 mins.
 - b) 3-5 mins.
 - c) More than 5 mins
- 7) Alternative anaesthetic to those who are allergic to Lignocaine
 - a) Diphenhydramine.
 - b) Ester group
 - c) General anaesthetics.

- d) All of the above
- 8) Preservative in LA solution is
 - a) Sodium metabisulfide
 - b) Methyl paraben
 - c) Thymol.
 - d) Saline
- 9) Concentration of Lignocaine used for injections during dental extractions.
 - a) 2%
 - b) 5%
 - c) 10%
- 10) Concentration of Lignocaine used for topical application (Gel form)
 - a) 2%.
 - b) 5%.
 - c) 10%
- 11) Systemic complications of Local anaesthetics
 - a) Anaphylaxis.
 - b) Infection
 - c) Nerve injuries.
 - d) all of the above
- 12) Maximum dosage of lignocaine with adrenaline is
 - a) 4.4 mg/kg body weight.
 - b) 7 mg/kg body weight.
 - c) 10 mg/kg body weight
- 13) Hypersensitivity reactions are more common in
 - a) Ester group LA.
 - b) Amide group LA.
 - c) None of the above
- 14) Do you test for LA allergy before each injection in the patient?
 - a) Yes.
 - b) Not at all.
 - c) Sometimes if necessary
- 15) To obtain a nerve block LA agent should be injected
 - a) into the nerve.
 - b) close to the nerve.
 - c) randomly into tissues
- 16) Aspiration before giving LA agent is recommended to avoid
 - a) Anaphylaxis.
 - b) Systemic toxicity.
 - c) Syncope

RESULT:

Option	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
1	24	11	18	17	11	18	14	14	26	4	13	17	15	3	6	14
2	7	9	8	10	10	13	11	16	5	19	6	12	11	20	23	11
3	0	8	2	3	5	0	3	1	0	8	7	2	5	8	2	6
4	0	3	3	1	5	0	3	0	0	0	5	0	0	0	0	0

Table 1: shows maximum number of 3rd year students choosing various options.

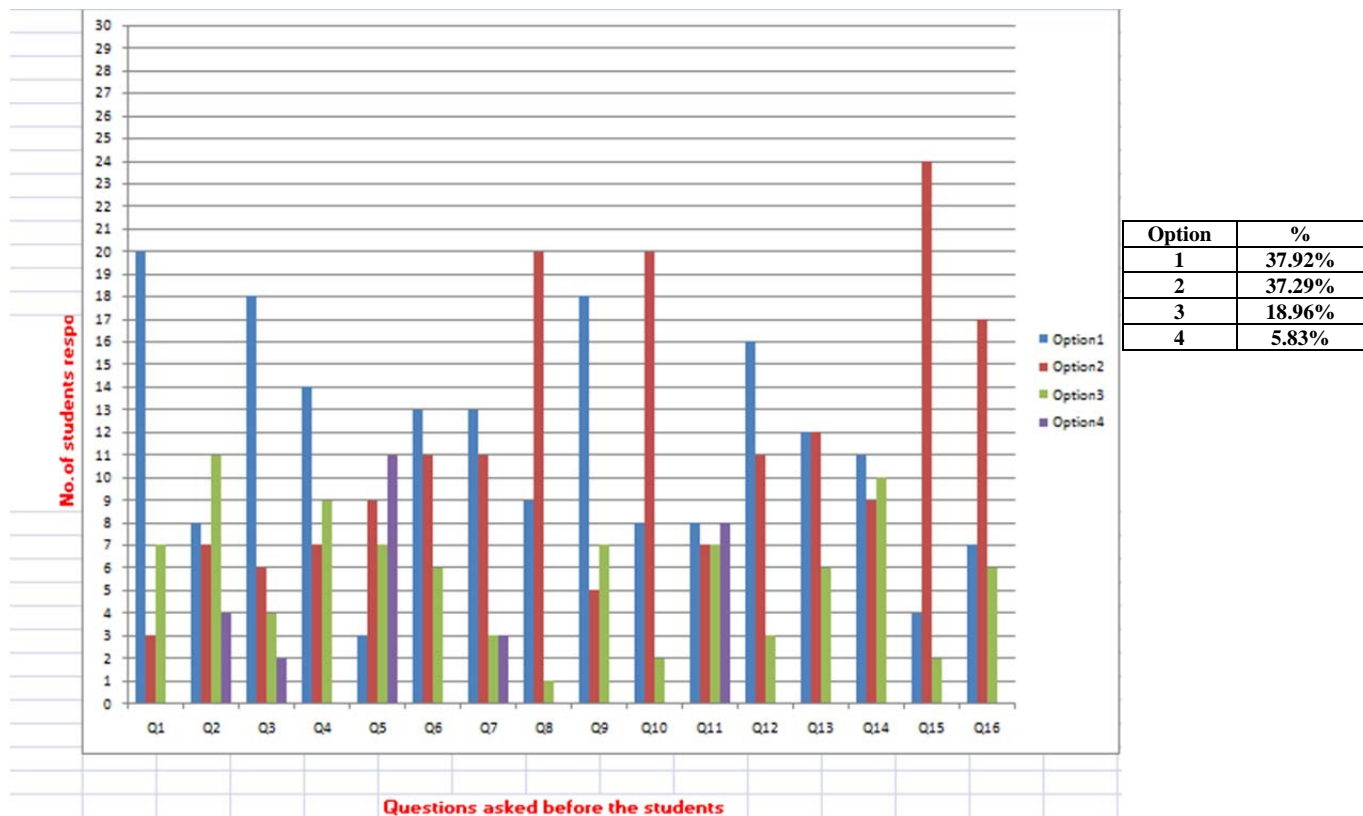


Option	%
1	45.36%
2	38.51%
3	12.10%
4	4.03%

Table 2: Bar chart representing the maximum option chosen by 3rd year students

Option	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
1	20	8	18	14	3	13	13	9	18	8	8	16	12	11	4	7
2	3	7	6	7	9	11	11	20	5	20	7	11	12	9	24	17
3	7	11	4	9	7	6	3	1	7	2	7	3	6	10	2	6
4	0	4	2	0	11	0	3	0	0	0	8	0	0	0	0	0

Table 3: shows maximum number of 4th year students choosing various options.

Table 4: Bar chart representing the maximum option chosen by 4th year students

- 45.36% and 37.92% of 3rd year and 4th year undergraduates commonly use lignocaine during oral surgical procedures.
- 11 out of 31 3rd year and 8 out of 30 4th year dental students choose Articaine as a most commonly used local anaesthetic in western countries.
- 18 out of 31 3rd year and 18 out of 30 4th year choose Bupivacaine for long lasting effect of anaesthetic.
- 17 out of 31 3rd year and 14 out of 30 4th year correctly choose Lignocaine as short acting local anaesthetic.
- 5 out of 31 3rd year and 11 out of 30 4th year choose lignocaine for its ease of availability, cheaper and safest drug.
- 18 out of 31 3rd year and 13 out of 30 4th year mentioned lignocaine's onset of action as 1-3 mins.
- 14 out of 31 3rd year and 13 out of 30 4th year use Diphenhydramine as an alternative drug for lignocaine.
- 16 out of 31 3rd year and 14 out of 30 4th year choose correctly chose the preservative of LA as methyl paraben.
- 26 out of 31 3rd year and 18 out of 30 4th year use 2% concentration of lignocaine during oral surgical procedures.
- 19 out of 31 3rd year and 20 out of 30 4th year use 5% lignocaine (gel form) as a topical anaesthetic.
- 5 out of 31 3rd year and 8 out of 30 4th year says that anaphylaxis, syncope and nerve injuries are the systemic complications of LA.
- 12 out of 31 3rd year and 11 out of 30 4th year use 7mg/kg bodyweight of lignocaine with adrenaline.
- 13 out of 31 3rd year and 15 out of 30 4th year clearly mentioned that ester group of LA shows hypersensitivity reaction than amide group.
- 20 out of 31 3rd year and 9 out of 30 4th year do not test for LA allergy before giving injection to the patient. It is mandatory to check for LA allergy to minimize the risk of hypersensitivity reactions.
- 23 out of 31 3rd year and 24 out of 30 4th year inject LA close to the nerve fibres. If it is injected into the nerve, may cause nerve injuries or randomly into the surrounding tissues may cause rapid absorption of LA.
- 11 out of 31 3rd year and 17 out of 30 4th year recommend aspiration before injecting LA, to prevent systemic toxicity.

DISCUSSION:

An accidental intravascular injection of local anaesthetics may occur following any injection procedures.

- A number of complications can arise from the incorrect administration of local anaesthetic injections, some of which are permanent and can damage patients or even be life threatening (2)(3)(4)(5)(6).
- Some authors recommend performing at least two negative aspirations before depositing local anaesthetics. The high levels of toxicity can be achieved by the accidental intravascular injection of local anaesthetics (7) (8).
- Syncope may be related to the fear of the dental injection and anxiety related events. Failure of local anaesthetics to be effective is related to many factors such as, inaccurate anatomical deposition of the local anaesthetic solution or the use of inadequate amounts of solution. The determination of local anaesthetist dosage remains a problem for most of the dentists sampled here. The inability to understand and manipulate such important issues in dentistry is of considerable concern as it is likely to render dentists as unsafe health providers.
- Evaluating the result of the study conducted indicate a relatively low level of knowledge, attitude, and practice regarding local anaesthetics among dental students.

CONCLUSION:

In conclusion, the knowledge of undergraduate students concerning the local anaesthetics maximum-dose and dose calculations appears inadequate and worrying, especially since systemic toxicity of local anaesthetics is dose dependent. It is recommended that undergraduates should update regarding the correct and current application of these critically important aspects in dentistry for providing better treatment without any complications.

REFERENCES:

- 1) S.T. Ayoub, A.E. Coleman, "A review of local anaesthetics", Gen. Dent., Volume 40, Issue 4, 1992, pp. 285-290.
- 2) F.L. Liao, S.H. Kok, J.J. Lee, R.C. Kuo, C.R. Hwang, P.J. Yang, et al. Cardiovascular influence of dental anxiety during local anesthesia for tooth extraction Oral Surg. Oral Med. Oral Pathol. Oral Radiol. Endod., Volume 105, Issue 1, 2008, pp. 16-26.
- 3) V.C. Conrado, A.J. de, G.A. de Angelis, A.C. de Andrade, L. Timerman, M.M. Andrade, et al. Cardiovascular effects of local anesthesia with vasoconstrictor during dental extraction in coronary patients Arq. Bras. Cardiol., Volume 88, Issue 5, 2007, pp. 507-513.
- 4) B. Rishiraj, J.B. Epstein, D. Fine, S. Nabi, N.K. Wade Permanent vision loss in one eye following administration of local anesthesia for a dental extraction Int. J. Oral Maxillofac. Surg., Volume 34, Issue 2, 2005, pp. 220-223.
- 5) S. Sapir, Y. Shapira, E. Amir Emergencies evolving from local anesthesia in the pediatric dental clinic: prevention and treatment Refuat. Hapeh. Vehashinayim, Volume 20, Issue 4, 2003, pp. 28-34 87.
- 6) R.S. Brown, S. Paluvoi, S. Choksi, C.M. Burgess, E.R. Reece Evaluating a dental patient for local anesthesia allergy Compend. Contin. Educ. Dent., Volume 23, Issue 2, 2002, pp. 125-322 134.
- 7) P.A. Moore, E.V. Hersh, S.G. Boynes Preface update of dental local anesthesia Dent. Clin. North Am., Volume 54, Issue 4, 2010, pp. xiii-xxiv.
- 8) F.U. Meyer Complications of local dental anesthesia and anatomical causes Ann. Anat., Volume 181, Issue 1, 1999, pp. 105-106.