

Knowledge and attitude of dental surgeons in India toward ocular complications of intra-oral local anesthesia

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Abstract

Background: Ocular disturbances such as blurring of vision, mydriasis, palpebral ptosis, diplopia, ptosis, enophthalmos, miosis, and blindness (temporary or permanent) are rare complications due to intra-oral local anesthesia. Currently, the guidelines to dentists on preventing and caring for such ocular problems are lacking. Hence, we evaluated the knowledge and attitudes of dentists toward ocular complications of intra-oral anesthesia as a means to assess the need for such guidelines. **Materials and Methods:** A cross-sectional prospective survey targeting dentists was conducted using a self-administered questionnaire. Totally 500 standardized self-administered questionnaires were sent out by E-mail to practicing dentists or academicians. In total, 390 replies were received, and the data were analyzed. **Results:** About 39% of graduates and 14% postgraduate dentists knew about ocular complications. Journals were the leading source of information among both graduates and postgraduate dentists. 8.3% graduates and 17.6% postgraduate dentists encountered ocular complications. Interestingly most of the graduates and postgraduates responded that ocular complications are underreported in the literature. 90.5% graduates and 84.3% postgraduates are in the opinion that more research should be carried on ocular complications. 98.3% postgraduates and 97.3% graduates favored the prevention of ocular complications. **Conclusion:** The dentist's knowledge about ocular complications due to intra-oral anesthesia in our study group is not adequate and needs improvement. Although the awareness and practice of taking preventive measures are satisfactory, there is a need for specific guidelines to dentists in identifying and clinically managing ocular complications of intra-oral anesthesia.

Key words: Dental anesthesia, diplopia, ocular complications

INTRODUCTION

Ocular disturbances, which are rare complications due to intra-oral local anesthesia,^[1,2] are often alarming to both the dentist and the patient.^[3] Ocular complications include blurring of vision^[4,5] and blindness, which can be temporary^[6] or permanent.^[7,8] Motor problems include mydriasis, palpebral ptosis, and diplopia. Horner-like manifestations

involving ptosis, enophthalmos and miosis of the eye are also reported.^[9] Although most complications are transient, there are rare reports of chronic and irreversible complications.^[7,8] Despite this, currently guidelines on preventing, caring and adequately managing ocular problems due to intra-oral anesthesia are not available to dentists, which necessitates the need for such guidelines and as well further research to understand the ocular complications due to intra-oral anesthesia and develop optimal therapeutic intervention. Hence, we initiated this survey to assess the knowledge and attitudes of dentists towards ocular complications of intra-oral anesthesia.

MATERIALS AND METHODS

A cross-sectional prospective survey targeting dentists was conducted using a self-administered questionnaire.

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Data were collected using standardized self-administered questionnaire, which included demography, knowledge of the occurrence of ocular complications, immediate reaction, prevention and ophthalmologist consultation. 500 survey questionnaires were E-mailed to registered dentists practicing or academicians. In total, 390 replies were received, and the data were analyzed anonymously. The sample comprised of all the dental surgeons practicing in the private sector, government sector and in academics. Descriptive statistics such as percentage was used to present the data.

RESULTS

An unsatisfactory level of knowledge about ocular complications due to dental anesthesia and a relatively positive attitude toward its prevention was observed. The general attitude of dentists toward ocular complications is sufficiently positive to enable the provision of the best prevention to the patients when required. A total of 390 dentists took part in the study, among which 148 and 242 were with graduates and postgraduates level qualification, respectively.

Knowledge of ocular complications among dentists with only graduate qualification

Surprisingly only 31.8% dentist's surveyed knew that ocular complications occur due to dental anesthesia, while 25% said ocular complications don't occur due to dental anesthesia and 43.2% were not aware of such complications. Among the dentists aware of the ocular complications associated with dental anesthesia, 40% indicated journals as a major source of information, while 28.6% had personal experience of it in their clinical practice and many others indicated a combination of internet, personal experience and journals being their major source of information. Only 17.6% of dentists encountered ocular complications due to dental anesthesia, where in the most common symptoms observed were diplopia and blurring of vision. Most of the symptoms' lasted for few minutes to few hours and only 11.5% of dentists consulted ophthalmologist to address these complications. Surprisingly 3.4% dentists responded that ocular complications causes' permanent blindness. Nevertheless, 75.7% of the dentists indicated that ocular complications due to dental anesthesia are underreported in the literature, which is a cause for concern. 36.5%, 15.5% and 7.4% of the respondents associated ocular complications with infra orbital, inferior alveolar nerve and superior alveolar nerve block, respectively. While 8.1% responded that all the blocks can lead to ocular complications and 32.4% respondents did not associate any of these blocks with ocular complications. Interestingly 36.5% responded that ocular complications are systemic complications, 36.5% responded that they don't know, 18.2% said ocular complications are local complications and remaining 20.9% responded that it's both local and systemic response [Table 1].

Table 1: Knowledge questions

Knowledge questions	Qualification (%)	
	Graduates (total 148)	Postgraduates (total 242)
Do you know that ocular complications occur due to intra oral local anesthesia?		
Yes	47 (31.8)	36 (14.9)
No	37 (25)	90 (37.2)
Don't know	64 (43.2)	116 (47.9)
If yes, than source of information?		
Personal experience	10 (28.6)	10 (31.3)
Colleagues	—	—
Text books	—	—
Internet	—	—
Journals	14 (40)	10 (31.3)
Magazines and news papers	—	—
All of the above	—	—
Personal experience and Internet	3 (8.6)	2 (6.3)
Personal experience, Internet and journals	1 (2.9)	2 (6.3)
Personal experience and Journals	0	2 (6.3)
Internet and journals	7 (20)	6 (18.8)
Did you encounter any ocular complications during or after administration of intra oral local anesthesia?		
Yes	26 (17.6)	20 (8.3)
No	122 (82.4)	222 (91.7)
If yes, what were the symptoms did you notice in a patient?		
Blurring of vision	9 (34.6)	5 (25)
Double vision	6 (23.1)	8 (40)
Squinting	—	—
Transient dizziness	4 (15.4)	5 (25)
Loss of vision	—	—
Difficulty in reading	1 (3.8)	1 (5)
Drooping of the upper eyelid	—	—
Decreased sensation on the lateral aspect of the upper and lower eyelid	6 (23.1)	1 (5)
How long the symptoms lasted?		
Few seconds	1 (3.8)	0
Few minutes	18 (69.2)	5 (25)
Few hours	7 (26.9)	15 (75)
Few days	—	—
Did you consult ophthalmologist for ocular complications?		
Yes	3 (11.5)	4 (20)
No	23 (88.5)	16 (80)
Do you know that sometimes ocular complication due to intra oral local anesthesia causes permanent blindness?		
Yes	5 (3.4)	25 (10.3)
No	43 (29.1)	71 (29.3)
Don't know	100 (67.6)	146 (60.3)
Do you feel ocular complications due to intra oral local anesthesia has been reported in the literature?		
Under reported	112 (75.7)	193 (79.8)
Adequately reported	36 (24.3)	49 (20.2)
Over-reported	—	—

Continued

Table 1: (Continued)

Knowledge questions	Qualification (%)	
	Graduates (total 148)	Postgraduates (total 242)
Which intra oral nerve block can causes maximum ocular complications?		
PSA	11 (7.4)	28 (11.6)
Infra orbital	54 (36.5)	77 (31.8)
Inferior alveolar	23 (15.5)	32 (13.2)
All of the above	12 (8.1)	63 (26)
None of the above	48 (32.4)	42 (17.4)
Do you know ocular complications due to intra oral local anesthesia are?		
Local complications	27 (18.2)	57 (23.6)
Systemic complications	36 (24.3)	80 (33.1)
Both	31 (20.9)	45 (18.6)
Don't know	54 (36.5)	60 (24.8)

PSA: Posterior superior alveolar

Attitudes of dentists with only graduate qualification

Majority of respondents (45.3%) answered that their immediate reaction on encountering with ocular complication is to shift the patient to hospital care, 22.3% preferred to summon medical emergencies, 18.2% indicated calling ophthalmologist and only 14.2% opted for reassurance to the patient and stop the intended dental procedure. No one opted to ignore and proceed with intended dental procedure. Regarding prevention of ocular complications, 12.8% answered it can be prevented by knowing accurate anatomy of the nerve block area, 27.7% opted for aspirating before injection and hence avoid injecting into blood vessels and 9.5% preferred following accepted injection techniques. Most of the respondent's (39.9%) answered that it can be prevented by all above methods, and only 10.1% opted none of the above option.

About 31.8% answered they will consult ophthalmologist 24 h after the onset of ocular complication, 27% after completing dental procedure, 17.6% if signs and symptoms last for 4 h, only 8.1% prefer immediate consultation and 15.5% were not willing to consult ophthalmologist. About seriousness of ocular complications, 20.3% indicated yes, 9.5% opted no and 70.3% respondents responded don't know, which is a worry. 90.5% of dentists are in the opinion that more research and review should be carried out on ocular complications due to dental anesthesia. 95.3% of dentists believe that more information should be published in journals, textbooks and other sources about ocular complications due to dental local anesthesia. Relatively, a large proportion (97.3%) of dentists expressed prevention of ocular complications [Table 2].

Knowledge of ocular complications among dentists with postgraduate qualifications

Only 14.9% knew that ocular complications occur due to dental anesthesia. 37.2% responded no and remaining

47.9% answered don't know. Regarding source of information most of the dentists responded journal and personal experience as the leading source (31.3%) followed by personal experience (28.6%), personal and internet (8.6%), personal, internet and journal (2.9%) and internet and journal (20%).

Only 8.3% of dentist's encountered ocular complications due to dental anesthesia and majority (91.7%) did not encounter ocular complications. Among the dentists who encountered ocular complications, diplopia and blurring of vision were most commonly observed. Most of the symptoms' lasted for few minutes to few hours. Only 20% of dentists consulted ophthalmologist. 10.3% dentists responded that ocular complications causes' permanent blindness, 29.3% responded that it will not cause any complications and remaining 60.3% doesn't know that it causes permanent blindness. 79.8% indicated that ocular complications due to dental anesthesia are underreported in the literature where as 20.2% said it's adequately reported and none responded that its over reported. 31.8%, 13.2%, 11.6% and 26% associated the ocular complications with infra orbital, inferior alveolar nerve, superior alveolar nerve, and all blocks, respectively. While 17.4% indicated that none of these blocks cause ocular complications.

33.1%, 23.6%, and 18.6% responded that ocular complications are systemic, local and both systemic and local complications, respectively. While 24.8% responded that they don't know [Table 1].

Attitudes of dentists with a postgraduate qualification about ocular complications

Majority of respondents (52.5%) indicated shifting to hospital care following ocular complications, 19.4% indicated calling ophthalmologist, 12.4% preferred to summon medical emergencies, 9.5% opted for reassurance to the patient and stop the intended dental procedure and 6.2% indicated ignoring ocular complications and proceed with intended dental procedure. 11.2% respondents answered that ocular complications can be prevented by knowing accurate anatomy of the area, 18.6% opted for aspiration before injection and avoid injecting into blood vessels, 15.3% preferred following optimal techniques, majority (37.2%) answered all of the above and 17.8% preferred none of the above option.

About 45% indicated consulting ophthalmologist 24 h following ocular complications, 28.1% answered they will consult ophthalmologist if ocular complication persist for over 4 h, 14.9% after intended dental procedure, 8.3% immediately and 3.7% expressed they will not consult ophthalmologist. About seriousness of ocular

Table 2: Attitude questions

Attitude questions	Qualification (%)	
	Graduation	Postgraduation
If you encounter ocular complications during or after administration of intra oral local anesthesia what would be your immediate reaction?		
Reassurance to the patient and stop the intended dental procedure	21 (14.2)	23 (9.5)
Summon medical emergency	33 (22.3)	30 (12.4)
Call ophthalmologist	27 (18.2)	47 (19.4)
Shift patient to hospital care	67 (45.3)	127 (52.5)
Ignore and proceed with intended dental procedure	0	15 (6.2)
Prevention of ocular complications due to intra oral local anesthesia is by?		
Knowing accurate anatomy of the nerve block area	19 (12.8)	27 (11.2)
Aspirate before the injection and avoid injecting into blood vessels	41 (27.7)	45 (18.6)
Follow accepted injection techniques and procedures	14 (9.5)	37 (15.3)
All of the above	59 (39.9)	90 (37.2)
None of the above	15 (10.1)	43 (17.8)
If encountered with ocular complications during or after administration of intra oral local anesthesia. When do you consult ophthalmologist?		
Immediately	12 (8.1)	20 (8.3)
After completing intended dental procedure	40 (27)	36 (14.9)
After 24 h	47 (31.8)	109 (45)
If signs and symptoms of ocular complications persist for more than 4 h	26 (17.6)	68 (28.1)
I will never consult ophthalmologist	23 (15.5)	9 (3.7)
Do you feel a dentist should take serious about ocular complications due to intra oral local anesthesia?		
Yes because if neglected sometimes it may cause irreversible damage	30 (20.3)	46 (19)
No, because most of the ocular complications are transient	14 (9.5)	6 (2.5)
Don't know	104 (70.3)	190 (78.5)
Do you feel more research and review should be carried out on ocular complications due to intra oral local anesthesia?		
Yes	134 (90.5)	204 (84.3)
No	14 (9.5)	38 (15.7)
Do you want more information should be published in the journals/books/other literature about ocular complications due to dental anesthesia?		
Yes	141 (95.3)	236 (97.5)
No	7 (4.7)	6 (2.5)
Do you want to prevent ocular complications due to dental anesthesia?		
Yes	144 (97.3)	238 (98.3)
No	4 (2.7)	4 (1.7)

complications, 19% indicated yes, 2.5% opted no and 78.5% respondents responded don't know. 84.3% of dentists suggested that more research and review should be carried out on ocular complications due to dental anesthesia. 97.5% of dentists believe that more information should be published in journals, textbooks and other sources about ocular complications due to dental local anesthesia. Relatively, a large proportion (98.3%) of dentists favored the prevention of ocular complications [Table 2].

DISCUSSION

Local complications of local anesthetic injection include the hyperesthesia or burning sensation during injection, postinjection paresthesia, hematoma, and trismus.^[9] Structures far from the oral cavity including the middle ear^[10] and eye can also be affected by intra-oral local anesthesia.^[11,12] Surprisingly the average level of knowledge on ocular complications due to intra-

oral local anesthesia was low, suggesting an incorrect understanding of the local complications of local anesthesia. Many of the respondents in our survey did not know that ocular complications occur following dental anesthesia, which is of significant concern. The prevalence of ocular complications is low in dentistry relative to other local anesthetic complications and dentist attention regarding ocular complications due to dental anesthesia has not been widely aroused. Although ocular complications are rare to occur, but sometimes they may cause permanent damage to the eye. Dentist should be serious about ocular complications and try to prevent the complications. It is important for dentists to be well equipped with up-to-date information, treatment strategies, and knowledge of resources available on a continuous basis. Although the level of knowledge was low among the dentists, they were willing to learn, avoid active treatment and seek referrals. While journals and Internet were major source of information, there is a need for optimally formulated guidelines to practicing

dentists to enhance awareness on identifying and managing ocular complications.

Hence, the general education for the dentist should be supplemented with special education through continuing dental education. Although the postgraduate dentists had better knowledge, compare to graduate dentist, the knowledge about ocular complications due to intra-oral anesthesia and its management was not adequate and needs improvement. The knowledge gaps in ocular complications due to dental anesthesia should be addressed by providing adequate information through journals, textbooks, continuing dental educations, and further research.

REFERENCES

1. Kavitha P, Karishma M, Vinod K, Kartik V. Intraoral local anesthesia and ocular complications. *World J Dent* 2013;4:108-12.
2. Blanton PL, Jeske AH, ADA Council on Scientific Affairs, ADA Division of Science. Avoiding complications in local anesthesia induction: Anatomical considerations. *J Am Dent Assoc* 2003;134:888-93.
3. Freuen NF, Feil BA, Nortal NS. The clinical anatomy of complications observed in a posterior superior alveolar nerve block. *FASEB J* 2007;21:776.
4. Webber B, Orlansky H, Lipton C, Stevens M. Complications of an intra-arterial injection from an inferior alveolar nerve block. *J Am Dent Assoc* 2001;132:1702-4.
5. Cooper JC. Deviation of eye and transient blurring of vision after mandibular nerve anesthesia: Report of a case. *J Oral Surg Anesth Hosp Dent Serv* 1962;20:151-2.
6. Rood JP. Ocular complication of inferior dental nerve block. A case report. *Br Dent J* 1972;132:23-4.
7. Rishiraj B, Epstein JB, Fine D, Nabi S, Wade NK. Permanent vision loss in one eye following administration of local anesthesia for a dental extraction. *Int J Oral Maxillofac Surg* 2005;34:220-3.
8. Tomazzoli-Gerosa L, Marchini G, Monaco A. Amaurosis and atrophy of the optic nerve: An unusual complication of mandibular-nerve anesthesia. *Ann Ophthalmol* 1988;20:170-1.
9. Ngeow WC, Shim CK, Chai WL. Transient loss of power of accommodation in 1 eye following inferior alveolar nerve block: Report of 2 cases. *J Can Dent Assoc* 2006;72:927-31.
10. Brodsky CD, Dower JS Jr. Middle ear problems after a Gow-Gates injection. *J Am Dent Assoc* 2001;132:1420-4.
11. Peñarrocha-Diago M, Sanchis-Bielsa JM. Ophthalmologic complications after intraoral local anesthesia with articaine. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2000;90:21-4.
12. Cooley RL, Cottingham AJ Jr. Ocular complications from local anesthetic injections. *Gen Dent* 1979;27:40-3.

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