



ORIGINAL RESEARCH PAPER

Dentistry

KNOWLEDGE, AWARENESS AND PRACTICE ABOUT DENTAL TRAUMATOLOGY AMONG DENTAL PRACTITIONERS A CROSS SECTIONAL STUDY

KEY WORDS: Avulsion, dental trauma, re-implantation

- Tharnimathi K*** Under Graduate Student, Department of Conservative Dentistry And Endodontics , Adhiparasakthi Dental College & Hospital, Melmaruvathur, Tamilnadu 603319.*Corresponding Author
- Dr.Sriram sankar** MDS, Reader, Department of Conservative Dentistry And Endodontics Adhiparasakthi Dental College & Hospital, Melmaruvathur, Tamilnadu 603319.
- Dr.Ravisankar** MDS, Assistant Professor, Department of Public Health Dentistry, Adhiparasakthi Dental College & Hospital, Melmaruvathur, Tamilnadu 603319.

ABSTRACT

Aim:

The study evaluates the knowledge, awareness and practice among dentists in Kanchipuram regarding the emergency and clinical management of avulsed tooth. Traumatic injuries of teeth are common in both permanent and deciduous teeth, with avulsion being one of the most common traumatic injuries. **Objective :** Immediate replantation is considered the best treatment option for an avulsed tooth, but this cannot always be carried out immediately. The International Association for Dental Traumatology (IADT) updated a revised version in 2022 for the management of an avulsed tooth.

Materials and methodology: This study is a questionnaire-based cross-sectional study comprising 104 dentists practicing in Kanchipuram district of Tamil Nadu. A newly framed pretested and validated 11 questionnaire was divided into two sections; section one comprised of demographic questions and the second section comprised of management of an avulsed tooth. the result was collected and statistical analysis was done using IBM SPSS software version 22.0

Result: The questionnaire was to evaluate the knowledge about the critical time, survival duration of periodontal cells, storage media, extra oral dry time, splinting protocols and follow up details the result of the study indicated moderate level of knowledge and awareness among the participants regarding the management of the avulsed tooth **Conclusion :** The study concludes that there is a need for continuing education among dentist regarding the management of traumatic dental injuries to provide better treatment outcomes

INTRODUCTION:

Traumatic injuries of teeth are common to both the permanent and deciduous teeth. Trauma may affect both hard and soft tissue. Avulsion is one of the most common traumatic injury which is complete displacement of tooth from the alveolus. In school-age children, the occurrences range from 1% to 16% for permanent teeth and 7% to 13% for primary teeth [1]. With a higher prevalence among boys than girls [2]. The most common causes of avulsed teeth are fall, bicycle accidents, sports injuries, traffic accidents, assaults. Dental avulsion results in: (i) complete displacement of tooth from its socket; (ii) fracture of the supporting bone ;(iii) injury to the soft tissues [3]. A high prevalence of incidence in 7-11 years old, the maxillary central incisors are most prone to avulsion [4]. Psychological issues, pain, and function loss may occur due to inadequate treatment planning after traumatic dental injuries (TDIs). Prognosis for avulsed tooth depends on the following factors: extra-alveolar time, storage medium, root development, injury to the periodontal ligament, and how the avulsion injury was treated. Immediate replantation is considered to be the best treatment option for avulsed tooth but that cannot be carried out immediately. The International Association for Dental Traumatology (IADT) released a set of recommendations in 2022, for the management of avulsed tooth, it is important that the level of knowledge of dental clinicians is sufficient and updated [5,6]. There are no current statistics on Kanchipuram dentists' knowledge on treatment for TDIs. The objective of this survey-based study was to evaluate the level of knowledge, awareness and practice among Kanchipuram dentists regarding the emergency and clinical management of avulsed tooth.

MATERIALS AND METHOD:-

This study is a questionnaire based cross-sectional study comprising of 104 dentists practising in Kanchipuram district of Tamil Nadu. The target participants were registered dental

practitioners under the state dental council of Tamil Nadu. The study was held during the period of December 2022 –February 2023. Participants were those who had completed a Bachelor's or Master's degree in dentistry and were currently practicing, those who were enrolled and submitted their filled perform on online were included in the study. A newly prepared, pretested and validated 11 questionnaire (Table 1) that could match the IADT guidelines was circulated to 104 dentists through social media applications. Participants details were maintained confidentially. The questionnaire was divided into two sections, section one comprised of 5 demographic questions including name, age, gender, type of practice (General/Specialist), years of experience and second section comprised of management of avulsed tooth. The questionnaire was to evaluate the knowledge about the critical time, survival duration of periodontal cells, storage media, extra oral dry time, splinting protocol, follow up period.

Table 1. Questions regarding the management of avulsed tooth :-

PARAMETER	FREQUENCY	MEAN	S.D
AGE	104	30.72	6.913
GENDER	MALE	56	1.46
	FEMALE	48	
TOTAL	104	-	-

Table2: Age and Gender wise distribution of study population

Q1. "Critical time" which determines the prognosis in management of dental avulsion	First 30 minutes (58.8%)	First 60 minutes (37.3%)	First 90 minutes (3.9%)	Don't know[0 %]

Q2.Survival duration of periodontal cells after tooth avulsion	<20 minutes (60.2%)	20 - 60 minutes (35%)	> 1 hour(4.90%)	
Q3.Which of the storage media is best suited for the storage of avulsed tooth	HBSS solution (71.8%) Root resorption(30.7%)	Tap water [0%]	Milk(9.7%)	Patient's mouth(18.4%)
Q4.Extraoral dry time exceeding 1 hour, usually associated with	Root resorption(30.7%)	Tooth ankylosis(23.8%)	Both (41.6%)	Others(4%)
Q5.How to treat the socket prior to replantation ?	Gentle irrigation and aspiration with saline(85.4%)	Remove coagulum with curette (12.6%)	No treatment(1.9%)	
Q6.Topical treatment of root surface done using	Doxycycline(69.6%)	Tetracycline(12%)	Chlorhexidine(16.7%)	Others[0%]
Q7.Type of splint to stabilize the replanted tooth	Rigid splint (49.4%)	Flexible splint(49.4%)	No splints(1%)	
Q8.Splinting duration after avulsion of replanted tooth	10-14 days (76.7%)	28-30 days(18.4%)	60 days(4.9%)	no splinting[0%]
Q9.Is it mandatory to do root canal treatment for avulsed teeth	Yes(81.6%)	No(18.4%)		
Q10.Duration of follow up period for clinical and radiographic examination	1,3,6 and 12 months (86.1%)	1,6,12 and 24 months (7.9%)	every 6 months up to 36 months (9%)	no follow up needed(1%)
Q11.Is antibiotic therapy necessary after replantation	Yes(74.5%)	No(17.6%)		

Table 3. normality test

Parameter	CLINICAL EXPERIANCE	SPECIALITY DEPATMENT	CRITICAL TIME	SURVUVAL DURATION	STORAGE MEDIUM	EXTRA ORAL DRY TIME	SOCKET TREATMENT
Mean	5.61	2.73	1.41	1.44	1.38	2.13	1.15
S.D	5.973	2.615	.551	.588	.656	.867	.413
Kolmogorov Smirnov Test	1.774	3.391	3.968	3.872	4.459	2.916	5.209
Significance	.004	.000	.000	.000	.000	.000	.000

Table 4. Comparison between the factors with clinical experience

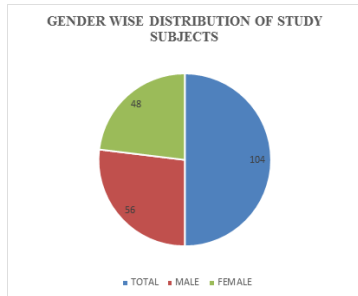
Factors	Parameter	CRITICAL TIME	SURVUVAL DURATION	STORAGE MEDIUM	EXTRA ORAL DRY TIME	SOCKET TREATMENT	TOPICAL TREATMENT	RCT	SPLINT DURATION	SPLINT TYPE	FOLLOW UP
Clinical experience	Pearson's correlation	.115	.265**	.019	.079	.121	.017	.278**	.132	.055	.047
	Significance	.244	.007	.849	.428	.222	.861	.004	.181	.582	.635
Department	Pearson's correlation	.266**	.116	.139	.002	.024	.198*	.087	.066	.105	.027
	Significance	.006	.241	.161	.983	.807	.044	.379	.503	.287	.786

Table 5. Correlation between the factors in study population

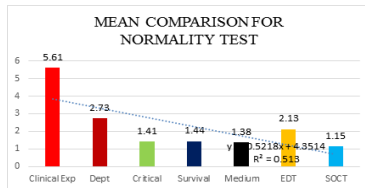
FACTORS	GROUPS	MEAN SQUARE	F	SIGNIFICANCE
CRITICAL TIME	BETWEEN GROUPS	.533	1.897	0.042
	WITHIN GROUPS	.281		
SURVIVAL DURATION	BETWEEN GROUPS	.302	0.862	0.562
	WITHIN GROUPS	.350		
STORAGE MEDIUM	BETWEEN GROUPS	.521	1.234	0.284
	WITHIN GROUPS	.422		
EXTRAORAL DRY TIME	BETWEEN GROUPS	1.510	2.225	0.027
	WITHIN GROUPS	.679		
SOCKET TREATMENT	BETWEEN GROUPS	.110	0.623	0.775
	WITHIN GROUPS	.176		
TOPICAL TREATMENT	BETWEEN GROUPS	0.561	0.966	0.473
	WITHIN GROUPS	0.581		
SPLINT TYPE	BETWEEN GROUPS	0.463	1.993	0.049
	WITHIN GROUPS	0.232		
SLPINT DURATION	BETWEEN GROUPS	0.197	0.637	0.763

RCT	WITHIN GROUPS	0.310	1.016	0.433
	BETWEEN GROUPS	0.153		
FOLLOW UP	WITHIN GROUPS	0.151	1.380	0.208
	BETWEEN GROUPS	0.383		
ANTIBIOTIC THERAPY	BETWEEN GROUPS	0.792	2.345	0.020
	WITHIN GROUPS	0.388		

GRAPH 1



GRAPH 2



STATISTICAL ANALYSIS:

The data were collected from the participants and entered in to Microsoft excel spread sheet. The statistical analysis was performed using IBM SPSS software version 22.0. The descriptive statistics were analyzed to depict the distribution of the study population in age and gender wise comparison. The inter group comparison and difference between the group were done using independent sample test to check for the statistical variation with P values less than 0.05 as statistical significance level. The correlation between the group were analyzed by using Pearson's correlation coefficient test with P value <0.05 as statistical significance.

RESULTS:

Table 2 represents age and gender wise distribution of study population in which 104 participants participated with the age group of 30.72 , gender wise distribution make 56 and female 48 with mean value of 1.46 [Standard deviation 0.501].

Table 3 represents normality test using Kolmogorov Smirnov test , indicated all factors showed statistical difference between them , which indicates the data is distributed normally.

Table 4 represents comparison between the various factors with regards to clinical experience among the study subjects in which critical time showed statistical difference with P value 0.042 and Extra oral dry time showed 0.027 and splint showed 0.04 , finally antibiotic therapy showed 0.02 The results from the ANOVA shows that , there existed difference among the study subjects in accessing their knowledge, awareness and practice depicting the critical time, Extra oral dry time, awareness on splinting and antibiotic therapy was adequate among them. Apart from which other factors needs improvisation.

Table 5 represents, correlation between the factors in the study population by using Pearson correlation coefficient test , in which clinical experience showed significant difference in survival time, knowledge on Root canal treatment only showed this have a strong positive correlation between survival time and avulsion existed with 26% discrimination ability. Root canal treatment, knowledge also showed

correlation with 27% discrimination ability. Finally, when multiple specialties knowledge, awareness and practice was compared with avulsion, only the critical time showed strong positive correlation with 26% discrimination ability.

This assessment revealed that the practitioners had a moderate level of expertise to support the correct diagnosis and therapy for the management of avulsed tooth.

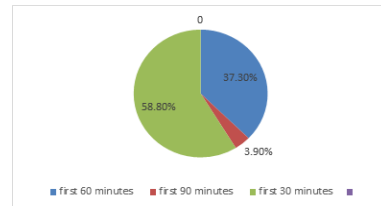


Fig 1. Critical time that determines the prognosis of avulsion

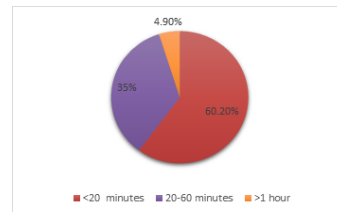


Fig 2. Survival duration of PDL cells after avulsion

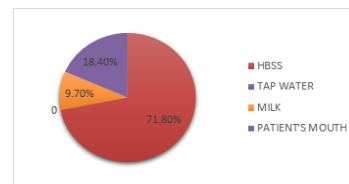


Fig 3. Suitable storage media

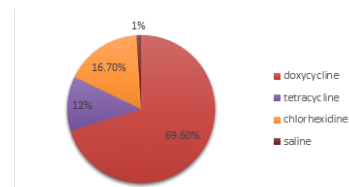


Fig 4. Topical treatment of root surface

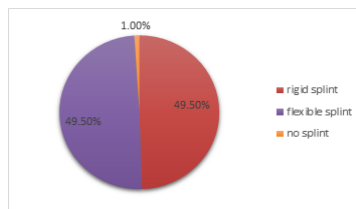


Fig 5. Type of splint to stabilize the replanted tooth

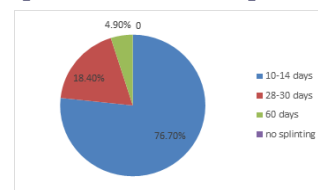


Fig 6. Splinting duration after avulsion

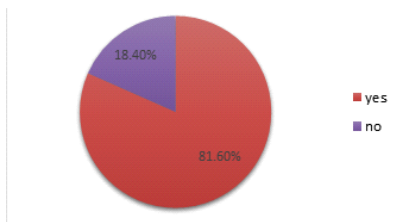


Fig 7. is it mandatory to do RCT for avulsed tooth

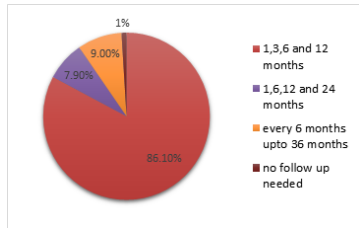


Fig 8. Follow up period for clinical and radiographic examination

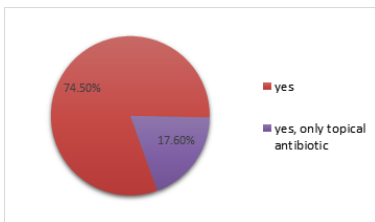


Fig 9. Is antibiotic therapy necessary after replantation

DISCUSSION :

In this research, the IADT Guidelines for the treatment of TDIs were evaluated among the dentist, it is important that dentists are expected to have clinical skills, diagnostic knowledge. Similar to this, many earlier studies have noted a lack of information regarding the treatment of avulsed tooth among dentistry professionals[7]. The results also showed that gender and clinical experience did not affect the mean knowledge score.

A research conducted by Hashim et al. in the United Arab Emirates among undergraduate students, those who attended lectures on dental trauma had much better understanding of how to treat avulsion tooth[8].According to Hu et al. Endodontists had greater understanding of dental trauma than general dentists in Brazil[9].Zafar et al., the specialization was significantly correlated with tooth avulsion[10]. Another research revealed that professionals had greater emergency management knowledge about TDIs than General dental practitioners[11].Our results are compared to those of the studies mentioned previously, which also found that awareness of TDIs is in the moderate range. The prognosis of avulsed tooth relies on the proper emergency management performed[12]. The appropriate treatment for the avulsed tooth is reimplantation. When rapid replantation is not feasible, the care of avulsed teeth, extra-oral time, and the use of a storage medium are crucial for a favourable long-term outcome.

In the present study for evaluation of critical time 58.80% chose first 30 minutes while 37.30% chose first 60 minutes as avulsed tooth should be reimplanted immediately. If the extra oral dry time exceeds more than 20 minutes there is chance of tooth ankylosis[13].

To preserve the vitality of the tooth it should be stored in a proper storage media within the critical time for reimplantation[14]. Storage media in order of preference is

Hank's balanced salt solution (HBSS), cold milk, patient's saliva, saline solution, water[15].It was found that 71.8% of dentists selected Hank's balanced salt solution (HBSS) as the storage medium for an avulsed tooth.

Doxycycline has antibacterial and anti-inflammatory properties, and it may increase the revascularization of avulsed teeth with an open apex and better prognosis[16]. According to Shaul et al. In avulsed tooth with close apex, root conditioning with doxycycline led to full recovery after 16 months[17]. In the present study 69.60% of the participants chose doxycycline for topical treatment of the root surface. According to Cinar et al. 39.6% of dentists chose doxycycline. In the in the current research, 59.8% of participants stated they would soak an open-apex avulsed tooth in a doxycycline solution[18].

If the extra oral dry time exceeds more than 60 minutes root canal therapy should be done prior reimplantation [12]. The splinting technique should ensure the normal physiological movement after reimplantation, if the extraoral drying period is greater than 60 minutes, IADT standards advise flexible splinting for 2 weeks for avulsed teeth with closed apex[19]. In this study, 49.50% chose flexible splint and 76.70% of the participants chose splinting duration of 2 weeks.These results showed that the subjects' understanding of the splint to be used and splinting period for an avulsed tooth was satisfactory.

An antibiotic can effectively stop bacterial infiltration of the tissue and inflammatory resorption following the replanting of the avulsed tooth[16].The IADT guideline also suggests administering systemic antibiotics like penicillin or doxycycline[12]. In the present study, 69.60% of participants preferred doxycycline for avulsion injury.

In comparison, a study conducted by Uthman on knowledge, awareness, and practice (KAP) reveals that there is a dearth of KAP among students pursuing dentistry in Saudi Arabia[20]. Further way to gain knowledge, awareness and practice about avulsion is through the training for dental traumatology.

CONCLUSION :

As there were many young participants in the study, and due to lack of experience and knowledge in the management of dental trauma the assessment level was low to moderate.

The critical time, survival duration of periodontal cells, root canal treatment had significant correlation between the factors and the knowledge was satisfactory. And the knowledge regarding storage media, extra oral dry time, socket treatment, topical treatment, type of splint , splint duration was unsatisfactory. And in depth knowledge about the management of TDIs was lacking among the participants. The knowledge of the dental practitioners can be enhanced by organizing workshops with video demonstration for the management of avulsed tooth. The management of dental trauma should follow the revised version of IADT guidelines updated in 2022 and as well as the mobile application – Tooth SOS.

REFERENCE:

- Andreasen FM, Andreasen JO. Textbook and color atlas of traumatic injuries to the teeth. 3rd ed. St Louis: Mosby, Inc.;1994;383-425.
- Andreasen, J.O.; Andersson, F.M. Textbook and Colour Atlas of Traumatic Injuries to the Teeth, 5th ed.; Wiley-Blackwell: Hoboken, NJ, USA, 2018
- Wood, E.B.; Freer, T.J. A survey of dental and oral trauma in south-east Queensland during 1998. Aust. Dent. J. 2002, 47, 142-146. [CrossRef] [PubMed]
- Holan C, Shmueli Y. Knowledge of physicians in hospital emergency rooms in Israel on their role in cases of avulsion of permanent incisors. Int J Paediatr Dent. 2003;13:13-9
- Pedrini D, Panzarini SR, Poi WR, Sundefeld ML, Tiveron AR. Dentists' level of knowledge of the treatment plans for periodontal ligament injuries after dentoalveolar trauma. Braz Oral Res 2011;25:307-313.
- De França RI, Traebert J, De Lacerda JT. Brazilian dentists' knowledge regarding immediate treatment of traumatic dental injuries. Dent Traumatol 2007;23:287-290.

7. Fujita Y, Shiono Y, Maki K. Knowledge of emergency management of avulsed tooth among Japanese dental students. *BMC Oral Health* 2014;14(1):1-6. DOI: 10.1186/1472-6831-14-34.
8. Hashim R, Odeh R, Salah AH, et al. The influence of dental trauma education on undergraduate students at Ajman University, United Arab Emirates: An interventional study. *Adv Med Educ Prac* 2021;12:1237. DOI: 10.2147/AMEP.S336765.
9. Hu LW, Prisco CRD, Bombana AC. Knowledge of Brazilian general dentists and endodontists about the emergency management of dentoalveolar trauma. *Dent Traumatol* 2006;22:113-117
10. Zafar K, Chafaor R, Khan FR, Hameed MH. Awareness of dentists regarding immediate management of dental avulsion: Knowledge, attitude, and practice study. *J Pak Med Assoc* 2018;68:595.
11. Alaslami RA, Elshamy FMM, Maamar EM, Chazwani YH. Awareness about management of tooth avulsion among dentists in Jazan, Saudi Arabia. *Open Access Maced J Med Sci* 2018;6:1712
12. Andersson L, Andreassen JO, Day P, Heithersay G, Trope M. International Association of Dental Traumatology guidelines for the management of traumatic dental injuries: 2. Avulsion of permanent teeth. *Dent Traumatol* 2012;28:88-96.
13. American Academy of Pediatric Dentistry. Guideline on management of Acute Dental trauma. *Pediatr Dent* 2011;33(2):222-228.
14. Flores MT, Andersson L, Andreassen JO, Bakland LK, Malmgren B, Barnett F et al. Guidelines for the management of traumatic dental injuries II. Avulsion of permanent teeth. *Dent Traumatol* 2007;23:130-6.
15. Barret EJ, Kenny DJ. Avulsed permanent teeth: review of the literature and treatment guidelines. *Endod Dent Traumatol* 1997;13:153-63
16. Trope M. Clinical management of the avulsed tooth: present strategies and future directions. *Dent Traumatol* 2002;18:1-11
17. Shaul L, Omri E, Zuckerman O, Imad AN. Root surface conditioning in closed apex avulsed teeth: a clinical concept and case report. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2009;108:125-128.
18. Cinar C, Atabek D, Alaçam A. Knowledge of dentists in the management of traumatic dental injuries in Ankara, Turkey. *Oral Health Prev Dent* 2013; 11: 23- 30.
19. Levin L, Day PF, Hicks L, O'Connell A, Fouad AF, Bourguignon C, Abbott PV. International Association of Dental Traumatology guidelines for the management of traumatic dental injuries: General Introduction. *Dent Traumatol* 2020;36:309-313
20. Uthman U. Knowledge, attitude, and practices (Kap) survey on the management of traumatic dental injuries (Tdis) among dental students in Prince Sattam Bin Abdulaziz University (Psau), Alkharj. *J PharyBioallied Sci* 2022 1;14(5):S666-S672. DOI:10.4103/jpbs.jpbs_56_22