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Dentistry Section

Knowledge and Attitude of Parents towards Avulsed Permanent Tooth of their Children and its Emergency Management in Bhopal City

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ABSTRACT

Introduction: Dental avulsion is a commonly reported traumatic injury causing pain, aesthetic, functional, psychological and mental impairment. Since parents are in the immediate vicinity of children in such situations, their knowledge regarding the same is of great importance.

Aim: The aim of present study was to assess the level of parental knowledge and their attitude towards dental avulsion and its emergency management

Materials and Methods: A 10-stemmed questionnaire was prepared for this study which was modified form of questionnaire used by Raphael and Gregory. The questionnaire consisted of two parts and was provided in both English and Hindi languages. Parents had to mark one option provided to them in multiple choice questions, which they found to be right. A written consent according to ethical guidelines was taken by all the participants before filling up the questionnaire. The survey consisted of 550 parents who accompanied their children aged between 6 to 13 years in the Department of Pedodontics and Preventive Dentistry, Peoples Dental Academy, Bhopal, Madhya Pradesh, India. Chi- square test was applied to evaluate the associations in this study.

Results: Statistically it was observed that 34.5% of male participants exhibited more knowledge regarding the necessity of reimplantation of avulsed tooth in comparison to female participants. Also parents with higher educational background have showed positive response toward knowledge and attitude of emergency treatment of avulsed permanent tooth. About 25.6% of higher secondary level, 20.9% of undergraduate level, 10.9% of elementary school level and 0.4% of illiterate participants responded that reimplantation of avulsed permanent tooth is possible.

Conclusion: It was concluded from the study that regardless of the age, education level or other factors, parental knowledge of tooth avulsion management was found to be very low in our society. Parents who participated in this study reported having insufficient knowledge about dental trauma and unskilled to provide emergency care to their child.

Keywords: Extra-alveolar time, Questionnaire, Re-implantation, Trauma

INTRODUCTION

Dental avulsion is defined as complete removal of the tooth out of its socket. It causes severe damage to pulp and periodontal ligament tissues with or without fracture of the alveolar bone. Most common causes of dental trauma in children includes fall during sports and leisure activities [1,2]. This results in loss of anterior primary and permanent tooth causing pain, aesthetic, functional, psychological and mental impairment.

Most commonly involved teeth are maxillary central and lateral incisors [3] and such injuries are seen more in boys than girls [4,5]. Andreasen modified WHO classification of avulsion as an injury of periodontal tissues, as well as extrusive, lateral or intrusive luxation [6]. The prognosis of avulsed tooth is determined by adequate action taken immediately, which involves minimizing the time the tooth remains outside its socket, use of adequate storage and transportation medium and protecting the root surface and periodontal ligament from damage [7]. Prolonged extra-alveolar duration leads to an uncertain prognosis and teeth reimplanted within one hour after the injury have shown highest rate of functional healing [8], however in situation where immediate reimplantation of the avulsed tooth is not possible, the tooth should be placed in specific storage media like Hank's Balanced Salt Solution [9,10]. Since majority of dental injuries occur in home environment, therefore it is very important that parents must have basic knowledge regarding dental avulsion and its emergency management.

Therefore, the aim of present study was to assess the level of parental knowledge and their attitude regarding dental avulsion and its emergency management and immediate steps to be taken after the occurrence of such injuries.

MATERIALS AND METHODS

The present study was questionnaire based study. Systematic Sampling technique was used to select the sample for study. Patient with odd outpatient department numbers were selected during the period of January to May 2016. During this period, 550 parents who accompanied their children aged between 6 to 13 years in Department of Pedodontics and Preventive Dentistry, People's Dental Academy, Bhopal, Madhya Pradesh, India for receiving dental treatment for the first time were included in the study. A 10-stemmed questionnaire was prepared for this study, which was modified form of questionnaire used by Raphael SL and Gregory PJ [11]. The questionnaire consisted of two parts: In first part demographics (gender, education level, geographic status) was asked whereas second part consisted of questions about their knowledge and attitude regarding emergency care of dental trauma. The research protocol was approved by Institutional Human Ethical Committee. The nature and objective of the survey was explained to the participants. A written consent form (according to ethical guidelines) was signed by all the participants.

The questionnaire was provided in English as well as regional language i.e., Hindi. Each question was provided with multiple answers and the participants were requested to mark the option which they perceived to be appropriate according to their knowledge. Completed questionnaire were collected on the same

day. Any queries regarding questions were immediately explained and resolved.

STATISTICAL ANALYSIS

The data was tabulated in Microsoft Excel 2007 software and statistical analysis was performed using SPSS program for Windows, version 22. Chi-square test was applied to evaluate the association between the results and the gender, educational level and geographical status of the participants. All the tests presenting p-value < 0.05 were considered statistically significant.

RESULTS

A total of 550 parents who accompanied their children for receiving dental care in Department of Pedodontics and Preventive Dentistry were included in the study. Demographic data of the study has been presented in [Table/Fig-1].

Variables	Frequency	Percentage (%)
Total Respondents	550	
Male	361	65.6
Female	189	34.4
Educational Level		
Illiterate	58	10.5
Elementary School	225	40.9
Higher Secondary School	155	28.2
UG or Above	112	20.4
Geographical Background		
Rural	298	54.2
Urban	252	45.8

[Table/Fig-1]: Demographic data of the study participants.

Parent's gender, education level and locality

Statistically it was observed that 34.5% of male participants exhibited more knowledge regarding the necessity of reimplantation of avulsed tooth in comparison to female participants. Male parents showed higher percentage rate when questioned on previous information about tooth avulsion [Table/Fig-2].

Parents with higher educational background showed positive response toward knowledge and attitude of emergency treatment of avulsed permanent tooth. About 25.6% of higher secondary level, 20.9% of undergraduate level, 10.9% of elementary school level and 0.4% of illiterate participants responded that reimplantation of avulsed permanent tooth is possible. When enquired about self reimplantation most of the participants were in favour that one should not try to reimplant the tooth immediately by him/herself [Table/Fig-3]. No further significant association was observed between all the three variables [Table/Fig-2,4].

DISCUSSION

Term reimplantation means "Restoration of a bodily tissue or part (as a tooth) to the site from which it was removed" [12]. The permanent anterior teeth are not only important for aesthetics but are also essential for speech, mastication, health of the supporting tissues and psychological and mental health of children. Hence, immediate reimplantation of avulsed permanent incisors contributes to an improved self image and enhanced self esteem in children [13].

Questions	Answers	Male N (%)	Female N (%)	Total N (%)	Chi-square test (X)	p-value < 0.05 significant
K1 Possibility of reimplantation	Yes	190 (34.5%)	128 (23.3%)	318 (57.8%)	7.581	0.006
	No	165 (30.0%)	67 (12.2)	232 (42.2%)		
K2 Self reimplantation	Yes	91 (16.5%)	41 (7.5%)	132 (24.0%)	1.465	0.226
	No	264 (48%)	154 (28%)	418 (76%)		
K3 Timing of reimplantation	Immediately	143 (26%)	77 (14%)	220 (40%)	1.118	0.891
	As bleeding stops	61 (11.1%)	35 (6.4%)	96 (17.5%)		
	Within one hour	79 (14.4%)	47 (8.5%)	126 (22.9%)		
	Within 24 hours	30 (5.5%)	18 (3.3%)	48 (8.7%)		
	After five days	42 (7.6%)	18 (3.3%)	60 (10.9%)		
K4 Cleaning media	Water	135 (24.5%)	75 (13.6%)	210 (38.2%)	0.286	0.991
	Saline	147 (26.7%)	81 (14.7%)	228 (41.5%)		
	Milk	20 (3.6%)	9 (1.6%)	29 (5.3%)		
	Saliva	29 (5.3%)	16 (2.9%)	45 (8.2%)		
	Nothing	24 (4.4%)	14 (2.5%)	38 (6.9%)		
K5 Transport media	HBSS	20 (3.6%)	12 (2.2%)	32 (5.8%)	3.915	0.0562
	Water	173 (31.5%)	90 (16.4%)	263 (47.8%)		
	Saline	58 (10.5%)	38 (6.9%)	96 (17.5%)		
	Milk	56 (10.2%)	22 (4%)	78 (14.2%)		
	Nothing	21 (3.8%)	16 (2.9%)	37 (6.7%)		
	Handkerchief	27 (4.9%)	17 (3.1%)	44 (8%)		
K6 Previous Information	Yes	116 (21.1%)	42 (7.6%)	158 (28.7%)	7.625	0.006
	No	239 (43.5%)	153 (27.8%)	392 (71.3%)		
K7 Source of Information	Books	142 (25.8%)	79 (14.4%)	221 (40.2%)	5.742	0.125
	Media	88 (16%)	63 (11.5%)	151 (27.5%)		
	Newspaper	58 (10.5%)	21 (3.8%)	79 (14.4%)		
	Internet	67 (12.2%)	32 (5.8%)	99 (18%)		
A1 Necessity for saving permanent tooth	Yes	326 (59.3%)	175 (31.8%)	501 (91.1%)	0.676	0.411
	No	29 (5.3%)	20 (3.6%)	49 (8.9%)		
A2 First place of contact	Dentist	228 (41.5%)	126 (22.9%)	354 (64.4%)	2.156	0.340
	Hospital	36 (6.5%)	13 (2.4%)	49 (8.9%)		
	General Practitioner	91 (16.5%)	56 (10.2%)	147 (26.7%)		
P1 Previous experience of avulsion injury	Yes	240 (43.6%)	143 (26%)	383 (69.6%)	1.953	0.162
	No	115 (20.9%)	52 (9.5%)	167 (30.4%)		

[Table/Fig-2]: Response of parents of different genders towards first aid management of avulsed permanent tooth.

Questions	Answers	Illiterate N (%)	Elementary N (%)	Higher Secondary N (%)	UG or Above N (%)	Chi-square test (X)	p-value < 0.05 significant
K1 Possibility of reimplantation	Yes	2 (0.4%)	60 (10.9%)	141 (25.6%)	115 (20.9%)	268.964	<0.001
	No	56 (10.2%)	148 (26.9%)	26 (4.7%)	2 (0.4%)		
K2 Self reimplantation	Yes	6 (1.1%)	42 (7.6%)	5 (0.9%)	79 (14.4%)	169.479	<0.001
	No	52 (9.5%)	166 (30.2%)	162 (29.5%)	38 (6.9%)		
K3 Timing of reimplantation	Immediately	28 (5.1%))	78 (14.2%)	65 (11.8%)	49 (8.9%)	9.337	0.674
	As bleeding stops	11 (2%)	33 (6%)	30 (5.5%)	22 (4%)		
	Within one hour	8 (1.5%)	52 (9.5%)	42 (7.6%)	24 (4.4%)		
	Within 24 hours	5 (0.9%)	23 (4.2%)	14 (2.5%)	6 (1.1%)		
	After five days	6 (1.1%)	22 (4%)	16 (2.9%)	16 (2.9%)		
K4 Cleaning media	Water	21 (3.8%)	81 (14.7%)	68 (12.4%)	40 (7.3%)	10.994	0.529
	Saline	25 (4.5%)	78 (14.2%)	68 (12.4%)	57 (10.4%)		
	Milk	3 (0.5%)	12 (2.2%)	11 (2%)	3 (0.5%)		
	Saliva	7 (1.3%)	21 (3.8%)	10 (1.8%)	7 (1.3%)		
	Nothing	2 (0.4%)	16 (2.9%)	10 (1.8%)	10 (1.8%)		
K5 Transport media	HBSS	2 (0.4%)	15 (2.7%)	8 (1.5%)	7 (1.3%)	12.376	0.650
	Water	23 (4.2%)	109 (19.8%)	76 (13.8%)	55 (10%)		
	Saline	11 (2%)	33 (6%)	31 (5.6%)	21(3.8%)		
	Milk	10 (1.8%)	27 (4.9%)	28 (5.1%)	13 (2.4%)		
	Nothing	4 (0.7%)	11 (2%)	10 (1.8%)	12 (2.2%)		
	Handkerchief	8 (1.5%)	13 (2.4%)	14 (2.5%)	9 (1.6%)		
K6 Previous Information	Yes	20 (3.6%)	57 (10.4%)	43(7.8%)	38 (6.9%)	2.644	0.450
	No	38 (6.9%)	151(27.5%)	124 (22.5%)	79 (14.4%)		
K7 Source of Information	Books	20 (3.6%)	83 (15.1%)	72 (13.1%)	46 (8.4%)	11.959	0.216
	Media	11 (2%)	66 (12%)	37 (6.7%)	37 (6.7%)		
	Newspaper	13 (2.4%)	27 (4.9%)	25 (4.5%)	14 (2.5%)		
	Internet	14 (2.5%)	32 (5.8%)	33 (6%)	20 (3.6%)		
A1 Necessity for saving permanent tooth	Yes	54 (9.8%)	186 (33.8%)	153 (27.8%)	108 (19.6%)	1.273	0.736
	No	4 (0.7%)	22 (4%)	14 (2.5%)	9 (1.6%)		
A2 First place of contact	Dentist	33 (6%)	134 (24.4%)	107 (19.5%)	80 (14.5%)	6.035	0.419
	Hospital	5 (0.9%)	20 (3.6%)	11 (2%)	13 (2.4%)		
	General Practitioner	20 (3.6%)	54 (9.8%)	49 (8.9%)	24 (4.4%)		
P1 Previous experience of avulsion injury	Yes	34 (6.2%)	148 (26.9%)	123 (22.4%)	78 (14.2%)	5.317	0.150
	No	24 (4.4%)	60 (10.9%)	44 (8%)	39 (7.1%)		

[Table/Fig-3]: Response of parents of different educational qualification towards first aid management of avulsed permanent tooth.

Immediate reimplantation is the primary choice for managing permanent avulsed tooth [13], but in deciduous dentition it is contraindicated as it may hamper the growth of permanent successor [14].

Dental traumatic injuries frequently occur in society [15], and some may occur at home. Therefore, the ultimate prognosis of an avulsed tooth occurring in a child may depend on the parents' emergency knowledge of this procedure [16]. Most studies on the management of avulsed permanent teeth indicate that the level of knowledge is low in several countries [17-20].

The purpose of this study was to evaluate, by means of a questionnaire, parent's awareness of the emergency management of avulsed permanent teeth in a sample of 550 parents with different education levels and residential locality.

Present study revealed insufficient knowledge among parents regarding emergency management of tooth avulsion; the reason may be not having any previous information and knowledge regarding tooth avulsion.

Most important factor determining the prognosis of a reimplanted tooth is the viability of the periodontal ligament left on the root prior to reimplantation [21]. For desirable prognosis majority of the authors considered the following factors: minimal extra-oral period, appropriate storage and transport medium along with minimal damage to root surface and periodontal ligament [22-24].

Andreasen JO and Hjorting-Hansen E in their study concluded that under any circumstance, best results will be achieved if the tooth remains out the socket for less than 20 minutes [24], whereas Lin S et al., in their study found that appropriate reimplantation of an avulsed permanent tooth within 30 minutes has shown to have a 90% chance of success [25]. Only a negligible chance (5%) of long-term retention of an avulsed tooth exists if reimplantation occurs after two hours [25].

When interviewed about the possibility of reimplantation of avulsed permanent tooth, male participants showed higher level of awareness in comparison to the females. Three fouth (76%) of the parents were not in favour of self reimplantation. Likewise similar results have been observed in previous studies done by Shashikiran ND et al., Namdev R et al., Loo TO et al., Abdellatif AM and Hegazy SA, Santos ME et al., Ayodele A et al., Al-Jame Q et al., and Ozer S et al., [16,26-32]. The probable reason to this finding may be the lack of knowledge and apprehension towards hurting the child and giving pain while self reimplantation. However, Raphael SL and Gregory PJ in their study have reported that about 75% of participants were willing for attempting self reimplantation [11].

Knowledge about appropriate cleansing medium revealed that a total of 41.5% of the participants opted saline, followed by water (38.2%), whereas only 5.3% of the respondents stated to use milk for cleaning a soiled avulsed tooth. Abdellatif AM and Hegazy SA, and Al-Jame Q et al., in their study also reported lack of knowledge regarding cleansing medium [28,31].

A number of studies done by Raphael SL et al., Shashikiran ND et al., Abdellatif AM and Hegazy SA, Santos ME et al., Ayodele A et al., Al-Jame Q et al., and Ozer S et al., have validated lack

Questions	Answers	Rural N (%)	Urban N (%)	Chi-square test (X)	p-value < 0.05 significant
K1 Possibility of reimplantation	Yes	171 (31.1%)	147 (26.7%)	0.016	0.901
	No	126 (22.9%)	106 (19.3%)		
K2 Self reimplantation	Yes	77 (14%)	55 (10%)	1.313	0.252
	No	220 (40%)	198 (36%)		
K3 Timing of reimplantation	Immediately	111 (20.2%)	109 (19.8%)	7.154	0.128
	As bleeding stops	60 (10.9%)	36 (6.5%)		
	Within one hour	61 (11.1%)	65 (11.8%)		
	Within 24 hours	29 (5.3%)	19 (3.5%)		
	After five days	36 (6.5%)	24 (4.4%)		
K4 Cleaning media	Water	115 (20.9%)	95 (17.3%)	0.935	0.919
	Saline	123 (22.4%)	105 (19.1%)		
	Milk	14 (2.5%)	15 (2.7%)		
	Saliva	26 (4.7%)	19 (3.5%)		
	Nothing	19 (3.5%)	19 (3.5%)		
K5 Transport media	HBSS	19 (3.5%)	13 (2.4%)	5.789	0.327
	Water	142 (25.8%)	121 (22%)		
	Saline	54 (9.8%)	42 (7.6%)		
	Milk	47 (8.5%)	31 (5.6%)		
	Nothing	15 (2.7%)	22 (4%)		
	Handkerchief	20 (3.6%)	24 (4.4%)		
K6 Previous Information	Yes	87 (15.8%)	71 (12.9%)	0.101	0.751
	No	210 (38.2%)	182 (31.1%)		
K7 Source of Information	Books	126 (22.9%)	95 (17.3%)	1.410	0.703
	Media	78 (14.2%)	73 (13.3%)		
	Newspaper	42 (7.6%)	37 (6.7%)		
	Internet	51 (9.3%)	48 (8.7%)		
A1 Necessity for saving permanent tooth	Yes	271 (49.3%)	230 (241.8%)	0.019	0.890
	No	26 (4.7%)	23 (4.2%)		
A2 First place of contact	Dentist	194 (35.3%)	160 (29.1%)	2.236	0.327
	Hospital	30 (5.5%)	19 (3.5%)		
	General Practitioner	73 (13.3%)	74 (13.5%)		
P1 Previous experience of avulsion injury	Yes	200 (36.4%)	183 (33.3%)	1.610	0.204
	No	97 (17.6%)	70 (12.7%)		

[Table/Fig-4]: Response of parents of different residential locality towards first aid management of avulsed permanent tooth.

of knowledge about transport media choices [11,16,28-32]. The most preferred media was ice water followed by dry storage. The ideal storage medium should be capable of preserving cell vitality, adherence and clonogenic capacity [33] and should be readily available at the site of the accident or easily accessible [34]. In our study, when interviewed about appropriate transport media most of the respondent (47.8%) opted water, followed by saline (17.5%) and milk (14.2%). A very few (5.8%) of the respondents have chosen HBSS as the appropriate media. Krasner P and Person P [35] have proved HBSS as the most effective storage media whereas Blomloff L recommended milk as another storage medium [36]. The tooth can be also kept in the child's mouth [37], but it should be avoided because there may be possibility that child may swallow the tooth and other reason is that saliva is aseptic medium so it may infect the periodontal tissues. Gopikrishna V et al., stated that coconut water can also be used as transport medium effectively [38].

When enquired about the previous information regarding tooth avulsion 27.8% of participants gave positive response. This finding does not have any correlation with residential locality and educational background. In a similar study done by Shashikiran ND et al., it was reported that most of the parents have not received any previous information about emergency management of avulsed permanent tooth [16].

So far, to our knowledge, there has not been any such study that has evaluated the knowledge and attitude of parents towards avulsed permanent tooth of their children and its emergency management in covered area. Though, there have been case reports and review articles concerning avulsed tooth and its management, a survey study has not been done.

LIMITATION

Since, the study has been conducted on institutional basis and a small number of individuals were included in the study. Therefore, so as to get better knowledge regarding dental avulsion injuries and its management more number of study is needed to be conducted on a larger population.

CONCLUSION

Despite of differences between gender, age and locality, parental knowledge regarding tooth avulsion and management were found to be very low. The parents who participated in this study reported having insufficient knowledge about dental trauma and being unskilled to provide emergency care to their child. Therefore, it is necessary to plan educational strategies in the society to increase their knowledge, so that they are able to perform prevention procedures and provide emergency care.

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