

KNOWLEDGE ABOUT THE MANAGEMENT OF AVULSED TOOTH AMONG KARACHI SCHOOL TEACHERS

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ABSTRACT

The objective of this study was to assess the knowledge of school teachers regarding management of avulsed tooth. The information about the management of avulsed tooth was collected through a specifically designed questionnaire. A total of 150 questionnaires were distributed among teachers of five different private schools of Karachi who were dealing with children of 6 to 12 years old.

Out of 150 teachers only 100 answered the questionnaire (66%). Majority (80 %) of the teachers knew about the importance of emergency management of tooth avulsions. One third (34%) teachers answered affirmative regarding their experience with tooth avulsions. 26 % said that they would replant the avulsed tooth by themselves. More than half (57%) of the teachers, preferred water as the best storage medium than normal saline.

Knowledge of school teachers regarding management of avulsed tooth was unsatisfactory. It should be improved by continuous dental educational seminars in schools.

Key words: Avulsed tooth, dental trauma, periodontal ligaments, dental socket, and replantation

INTRODUCTION

Dental trauma involves injuries to the tooth, periodontium and supporting alveolar bone.¹ Traumatic dental injuries can have a significant impact on the life of a child, since it causes both physiological and physical pain.²

Every year a large number of dental injuries are reported especially among children belonging to 7-15 year age group.³ Dental injuries may cause intrusion, extrusion, avulsion, luxation and subluxation of the tooth.⁴ A study conducted in Brazil showed that main accidents resulting in dental injuries were falls that

mostly occurred while children were cycling and when they were skating.⁵

Outdoor activities such as sports can result in dental trauma. This occurs in both children and adults.^{6,7} Literature states that the "falls and blows to the face" are the most common causes of dental trauma.⁸ Other causes of dental injuries may be due to playground accidents domestic violence, bicycle and motor vehicle accidents and sports injuries.¹

Tooth avulsion results in separation of the tooth from the dentoalveolar socket and Tearing of the periodontal ligament, leaving viable periodontal liga-

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ment (PDL) cells on the root surface. If the PDL attachment does not dehydrate the cells will not undergo severe inflammatory response and allow replantation therefore it is imperative to keep these cells hydrated so that these cells remain vital and reattach to bone on replantation.⁹

The speed with which the avulsed tooth is replanted into the alveolar socket results in a favorable outcome therefore every effort should be made to replant the tooth within the first 15-20 minutes, as previously mentioned drying of viable PDL cells should be avoided.¹⁰

To replant a clean tooth with undamaged root surface the avulsed tooth should be stored in an appropriate medium till patient is brought to the dental office. The storage mediums in order of preference are Hank's balanced salt solution, milk, saliva, vestibule of the mouth or container with the patient's spit, normal saline or water.¹¹

Out of the above mentioned storage mediums the least desirable medium is water. The reason being that its hypo tonicity causes rapid lysis of the cells and increases the inflammation on replantation.¹²

A more specialized medium that can be used to store the avulsed tooth is the Hanks balanced salt solution. This solution has superior ability to maintain viability of the PDL cells, however this solution is not easily accessible.¹³

People most likely to be in contact with the child at the time of the injury are school professionals, thus their knowledge of emergency procedure is important for the better prognosis of the tooth.¹⁴

METHODOLOGY

A self administered questionnaire was designed and distributed among school professionals teaching 6-12 year old children. Five schools were selected in the survey with a faculty of 30 teachers. The sample size was selected on the basis of previous related research.^{21, 23, 24} The questionnaire was collected after 7 days for data analysis. The respondents for each question were kept anonymous and expressed in percentages.

Questionnaire: Knowledge about the management of avulsed tooth among Karachi school teachers.

Name of Educational Institute:

Teacher's Profile

1 Sex

☐ Male ☐ Female

2 Age

☐ 20-40 ☐ 41-60 ☐ 61 or more

3 Which level of education are you imparting?

☐ KG section ☐ Primary section
☐ Secondary section

4 Teaching experience

☐ <1 yr ☐ 1-5 yrs ☐ 6-10 yrs ☐ 10-15 yrs
☐ 16-20 yrs ☐ 21 yrs or more

5 Do you have any experience with tooth avulsion

☐ Yes ☐ No

6 Do you know the Importance of emergency management of tooth avulsion

☐ Yes ☐ No

7 What will you do with the child in case of tooth avulsion?

☐ There is a dental service clinic at the school.
☐ Find a nearest dentist.
☐ contact the dental hospital.
☐ call the child's parents.
☐ not doing anything. Other: Please Specify

8 Will you replant the avulsed tooth?

☐ Yes ☐ No

9 Will you wash the avulsed tooth?

☐ Yes ☐ No

If yes: Please specify the medium

10 If you will not replant the tooth, which storage medium will you use?

☐ ice ☐ tissue papers ☐ plastic ☐ gauze ☐ place in the child's mouth ☐ some liquid Other: specify

11 If you will maintain the tooth in any liquid, what will it be?

☐ Normal saline ☐ Milk ☐ Hank's balanced salt solution ☐ water ☐ saliva or other: please specify

RESULTS

The questionnaires were distributed among 150 school teachers of Karachi. Total of 100 teachers answered the questionnaire. Fifty teachers did not reply due to lack of interest in the survey. Female teachers were 76 and 24 were males.

Among the participants eighty two (82%) fell in the age bracket of 20 to 40 years and eighteen (18%) were between 41 to 60 years. Thirty one (31%) had a teaching experience of 1-5 yrs where as twenty seven (27%) had a teaching experience of 6-10 yrs. Seventeen (17%) with 10 to 15 years experience of teaching and twenty five (25%) were in this profession since the past 20 years. Regarding their experience with tooth avulsions thirty four (34%) answered affirmative.

Eighty (80%) teachers knew about the importance of emergency management of tooth avulsions. Only seven (7%) said that they would look for a dental service at school. Fifty five (55%) teachers answered that they would call the child's parents and twenty three (23%) replied that they would look for a dentist. Ten (10%) said that they would contact the dental hospital where as five (5%) would do nothing at all. Twenty six (26%) teachers said that they would replant the avulsed tooth themselves.

Regarding selection of storage medium twenty (20%) respondents would store the tooth in ice. Twenty seven (27%) opted to store the tooth in a tissue paper

PARTICIPATED SCHOOL TEACHERS (n=100)

GENDER

MALE	FEMALE
24	76

PARTICIPATED SCHOOL TEACHERS (n=100)

AGE

20-40 years	41-61 years
82	18

PARTICIPATED SCHOOL TEACHERS (n=100)

Teaching Experience

1-5 years	6-10 years	10-15 years	>20 years
31	27	17	25

where as thirty three (33%) selected to store the tooth in some liquid. Eight (8%) would store the tooth in child's mouth where as twelve (12%) suggested the gauze and plastic to store the tooth.

Water as the storage medium was preferred by fifty seven (57%) teachers and normal saline by twenty (20%).

TABLE 1: PREFERRED RESPONSE IN THE EMERGENCY MANAGEMENT OF TOOTH AVULSIONS
(n = 100)

Dental service clinic at school	Call the child's parents	Find a nearest dentist	Contact the dental hospital	Not doing anything
7	55	23	10	5

TABLE 2: SELECTION OF STORAGE MEDIUM
(n=100)

Store the tooth in ice	Store the tooth in a tissue paper	Store the tooth in some liquid	Store the tooth in child's mouth	Store the tooth the gauze and plastic
20	27	33	8	12

TABLE 3: PREFERRED LIQUID MEDIUM TO STORE THE AVULSED TOOTH

Water	Normal saline	Milk	Hanks balanced solution	Child own saliva	No Response
57	20	3	2	13	5

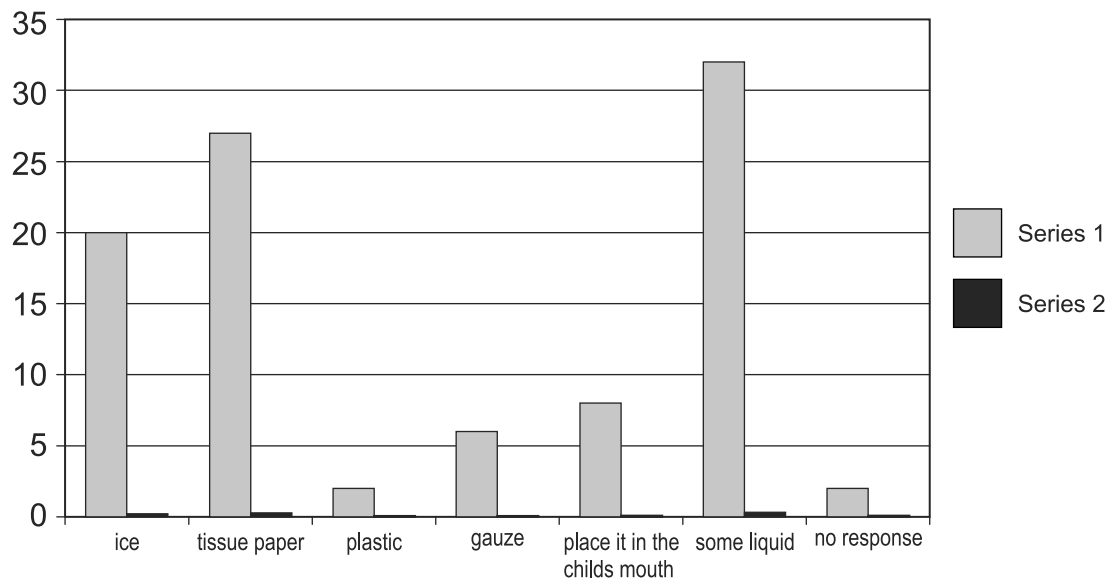


Fig 1: Graphical representation showing use of different storage medium by the respondents

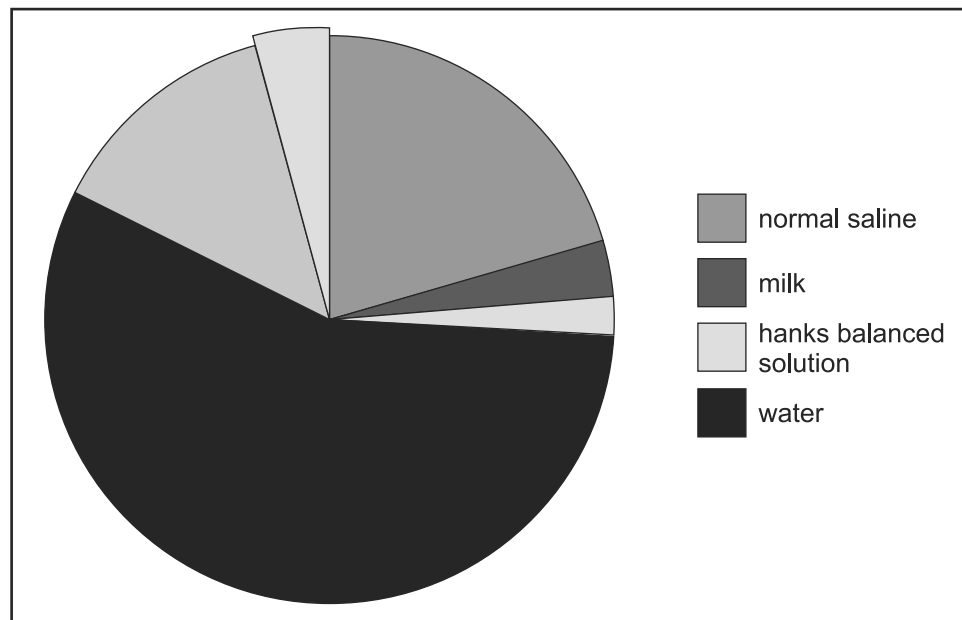


Fig 2: Pie chart showing distribution of storage medium.

Teachers who opted to store the avulsed tooth in milk were three (3%) and two (2%) would store it in hanks balanced solution. Thirteen (13%) of the teachers would store the avulsed tooth in the child's own saliva. Five (5%) gave no response.

DISCUSSION

There is an enormous deficiency of knowledge among school teachers on the management of tooth avulsion. The international association of dental trauma

matology in 2007 has developed a set of guidelines for the management of avulsed permanent teeth.¹⁶ As a step to educate the teachers following is a list of guidelines that can be followed in managing cases of tooth avulsion.¹⁶

- Make sure the avulsed tooth is the child's permanent tooth, since there are different guidelines for handling avulsed primary and secondary avulsed teeth.
- Try to keep the patient calm

- Find the tooth and pick it up from the crown part (white part). The root should not be touched
- If the tooth is dirty wash it for 10 seconds with running cold water and reposition it. Encourage the teacher to replant the avulsed permanent tooth. Primary avulsed teeth are not replanted. After replanting make the patient bite onto a handkerchief to hold the tooth in position.
- If replantation is not possible store the tooth in a storage medium such as milk, patients own saliva. The avulsed tooth can be transported in the mouth keeping it between the molars and inside the cheek keeping the root cells viable. Avoid storing the tooth in water.
- Seek emergency dental treatment immediately.

It is surprising to note that not only the teachers in developing nations but also in the developed countries fail to educate and train their educationalists and supervisors, regarding management of tooth avulsion. Griffin and Jones conducted a survey to evaluate the knowledge and attitudes of teachers in Irish schools.¹⁵ Data was collected by distributing questionnaires among teachers in 15 schools of Dublin. With 70.2% response rate their results showed that 74.8% of the teachers had not received any advice on the management of an avulsed tooth. Even though the teachers had limited knowledge in replanting an avulsed tooth, 45.3% of the teachers selected milk as a storage medium. This study concluded that teachers and other individuals who supervised children should be given instructions on management of tooth avulsion as part of their first aid kit.¹⁵

In present study, although 80% of the teachers knew the importance of management of tooth avulsion, their selection of storage medium was very poor and about 80% selected the wrong media. Similar results were found in the study of 2001 when Chan surveyed school teachers in Hongkong. He found that over 60% of the respondents indicated that it was "very urgent" to seek professional assistance for cases of permanent tooth avulsions. Only 9% of the respondents selected milk as the medium for transporting avulsed teeth.²²

In the present study it was observed that about 55% of the teachers rather than handling the situation themselves opted to call the child parents which would be too late to salvage the avulsed tooth. This indicated

that they were not at all trained to manage cases of tooth avulsion. Only 7 % of the teachers would send the child to the school dental service. According to the present study four out of the five schools did not have dental facilities on their respective campuses, which add to the delay in proper management of cases of avulsed tooth.

Many studies have been conducted to determine the correct, easy accessible storage medium for an avulsed tooth.^{13, 25} Storage mediums such as water and saliva are easily accessible but due to their low osmolality cause the root cells to equilibrate with the surrounding environment, imbibe water and burst. Saliva can also cause infected tooth root since it contains the normal flora. Milk is also a good option however it does not contain the required metabolites. The best storage medium to date is the ph balanced, cell preserving Hanks balanced solution that has all the required electrolytes and glucose that maintains the cells viability for extensive periods of time. In the present study only 3% respondents selected milk and 2% selected HBSS as the storage medium. This percentage is very poor and shows the lack of management of avulsed teeth.^{17, 18}

Although cases of tooth avulsion are common in schools, their management is never given its due importance. Mesgarzadeh did a survey in Iran among school teachers on the emergency management of traumatic dental injuries. Only 50% realized that they should replant a permanent avulsed tooth. However, they had little knowledge on the correct procedures; less than a fifth of participants were acquainted with the urgent need for action. Only 38% knew about appropriate washing mediums and about a third were familiar with proper storage media.¹⁹

Another survey on the same topic was conducted in Cardiff by Blakytyn: the results were unsatisfactory overall. But 45% of the teachers stated that they would store the avulsed tooth in milk which is in contrast to this study where only 3.1% of the teachers opted to store the avulsed tooth in milk. The majority of respondents possessed, at best, rudimentary knowledge of the emergency management of dental avulsion.²⁰

In 2007 Griffin et al published their study in Journal of Irish Dental association. According to the survey majority of teachers (81%) stated that they will

not be prepared to replant an avulsed tooth avulsed in a child.¹⁵ This is similar to present study in which only 26% of the teachers said that they will replant the avulsed tooth themselves. It was observed that 45% of respondents of their chose milk as an appropriate transport medium for the tooth which is not in accordance to this study where the percentage was as low as 3% only.¹⁵

Since it is expected of the physical education (PE) teachers to encounter dental trauma more due to correlation with sports, Rodney compared the level of knowledge of physical education teachers and academic teachers regarding dental trauma management. Results showed that only 19% of the teachers attempted to replant an avulsed tooth which in comparison to the present study (26%) is a bit low. 25% of the academic teachers and 23% of the PE teachers selected milk as their transportation medium which is not similar to this study.²¹

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