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Evaluation of the knowledge of tooth avulsion of school professionals from Adamantina, São Paulo, Brazil

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Abstract – Tooth avulsion is common in children, and emergency management in these cases is critical. This management can be made, not only by a dentist but by people who are present where the accident occurs. Consequently, knowledge of tooth avulsion is fundamental for school professionals working with children. The purpose of the present study was to evaluate the knowledge of tooth avulsion of school professionals from Adamantina, São Paulo, Brazil. For that purpose a questionnaire, including questions regarding emergency procedures for tooth avulsion, was answered by 117 teachers. The results demonstrated that 75.2% of school professionals knew the importance of emergency management and 60.6% would look for a dentist for treatment of the cases; 18.8% would reimplant the tooth and 7.6% would keep it in milk. This study showed the lack of knowledge of teachers on tooth avulsion; educational campaigns are necessary to improve the emergency management of tooth avulsion.

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Dental trauma is common (1). Its consequences can vary from simple tooth fractures to tooth avulsion. According to Pavek and Radtke (2), 10% of the population have had experience with dental trauma; tooth avulsion accounted for 0.5–16% of cases (1). Frontal impacts absorbed by the upper lip can result in displacement of the tooth from its socket (3). This occurs more frequently in teeth with lack of resiliency of the periodontal ligament; consequently, children between 7 and 11 years old are the most affected by injuries of this type (3).

The avulsed tooth must be reimplanted in its socket (1). For success of the reimplanted tooth, maintenance of vitality of the cells over the root is fundamental (4–7). So, the immediate reimplantation (1, 8, 9) or maintenance of the avulsed tooth in storage media compatible for survival of these cells before reimplantation (1) is fundamental. When the tooth is maintained in wet storage medium, i.e. milk, reimplantation can be made later, and the chances of success are increased (10–13). However, if the tooth is kept in dry storage medium before reimplantation, maintenance of vitality of the cells is impossible.

School professionals are likely to be in contact with children soon after the injury, and thus their knowledge of emergency procedures is critical to ensure better prognosis of the clinical treatment. Therefore, the purpose this study was to evaluate the knowledge on tooth avulsion of school professionals from Adamantina, São Paulo, Brazil, by application of a specific questionnaire.

Material and methods

A specific questionnaire was distributed for school professionals from Adamantina, São Paulo, Brazil. Children aged 6–12 years old study in these schools.

The questionnaire was delivered to the professionals and collected after 7 days, for analysis. The professionals responding the questionnaires were not identified.

The questionnaire was divided into three parts. Part I contained questions on age, sex, education and time of work at the school (Table 1). Part II contained basic questions on the importance of emergency management, tooth avulsion experience and what they would do with children in case of tooth avulsion (Table 2). Part III contained specific questions on tooth avulsion (Table 3). The respondents for each question were counted and expressed as percentages.

Table 1. Questions in part I of the questionnaire distributed for teachers from Adamantina, São Paulo, Brazil

1. Sex:	( ) Male ( ) Female
2. Age:	( ) Under
	( ) 20–40
	( ) 41–60
	( ) 61 or more
3. Education:	( ) High school ( ) Superior education
4. Time of work in school:	( ) <1 year
	( ) 1–5 years
	( ) 6–10 years
	( ) 10–15 years
	( ) 16–20 years
	( ) 21 years or more

Table 2. Questions in part II of the questionnaire distributed for teachers from Adamantina, São Paulo, Brazil

1. Experience with tooth avulsion: ( ) Yes ( ) No
2. Importance of emergency management: ( ) Yes ( ) No
3. What would you do with the child in case of tooth avulsion?
   ( ) There is a dental service clinic at the school
   ( ) Would look for a dentist
   ( ) Would contact the dental hospital
   ( ) Would call the child's parents
   ( ) Would not do anything

Table 3. Questions in part III of the questionnaire distributed for teachers from Adamantina, São Paulo, Brazil

1. Would you reimplant the avulsed tooth?
   ( ) Yes ( ) No
2. Would you wash the avulsed tooth?
   ( ) Yes ( ) No
3. If you would wash it, which solution would you use?
4. If you would not reimplant the tooth, would you maintain it in any storage containers or storage media?
   ( ) Yes ( ) No
5. What would you use?
   ( ) ice
   ( ) tissue papers
   ( ) plastic
   ( ) gauze
   ( ) place in the child's mouth
   ( ) some liquid
6. If you would maintain the tooth in any liquid, what would it be?

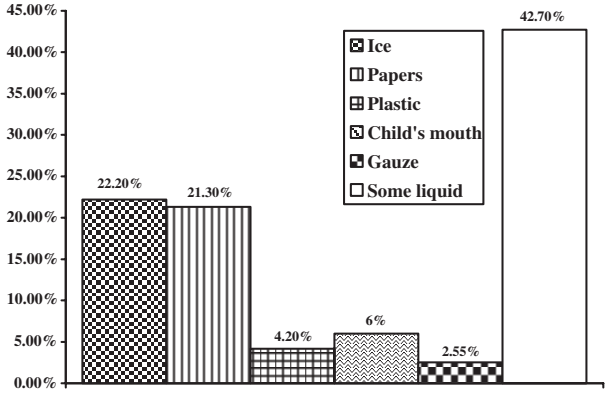

Fig. 1. Distribution of storage containers or storage media used by teachers for tooth avulsion.

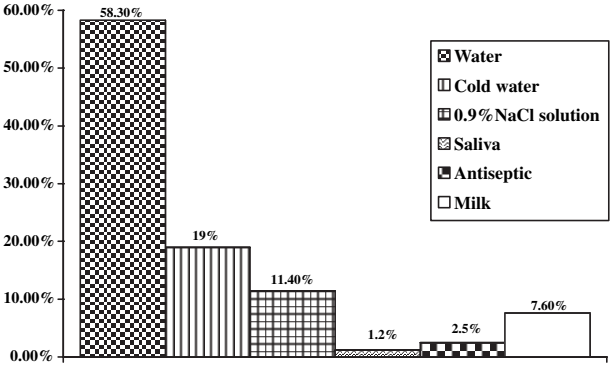

Fig. 2. Distribution of wet storage media used by teachers for tooth avulsion.

Results

A total of 117 teachers answered the questionnaire. Part I demonstrated that most were women (90.5%), aged 20–40 years old (53.1%), had superior education (82.4%) and had been working at the school for 10–15 years (41%). Part II demonstrated the importance of emergency management (75.2%) and the lack of experience of teachers with tooth avulsion (77% had never experienced it). In cases of tooth avulsion, 60.6%, would look for a dentist, 9.4% would not do anything and 58.1%, regardless of any conduct, would call the child's parents.

Part III, with questions on tooth avulsion, demonstrated that 75% of the professionals would not reimplant the tooth; rather, they would look for a dentist. Before going to the dentist, the professionals would wash the tooth (55%). Tap water was the most used solution (77.3%), after which the tooth would be maintained in some storage containers or storage media (Figs 1 and 2).

Discussion

The avulsed tooth must be reimplanted in its socket, attempting to repair the tooth (1). Andreasen (9), in

a study with monkeys, demonstrated that teeth reimplanted after 120 min had more areas of root resorption than teeth reimplanted after 18 min. In 1981, this was confirmed (14). Andreasen (15) noted that teeth immediately reimplanted had fewer areas of root resorption than teeth reimplanted after 18 min.

Later, Hammarström et al. (5) evaluated reimplanted monkey's teeth maintained in dry storage medium for 15 min or 1 h. The authors noted that teeth reimplanted after 15 min presented better conditions for repair. In 1990, Andersson and Bodin (8) investigated human teeth reimplanted after 15 min and noted that the majority of teeth had their integrity preserved. This demonstrates that a shorter extraoral time is better to preserve teeth, as there are fewer areas of root resorption.

However, when the tooth cannot be immediately reimplanted, it should be maintained in some storage medium (1, 16). Maintenance of the avulsed tooth in a storage medium maintains the vitality of cells present over the root for longer and, in some cases, even stimulates their proliferation (1).

In 1980, Oswald et al. (16) found better results for teeth maintained in saliva for 90 min than teeth kept in dry storage medium before reimplantation. The composition and osmolality of milk are more compatible for survival of cells over the root (10, 11). Lindskog and Blomlöf (13), 1982, comparing milk with saliva, noted better results when the milk was used. Because of its hypotonicity and microorganisms, the saliva can contribute to cell death. The maintenance of teeth in milk should not exceed 6 h (12).

Comparing milk with Hank's Balanced Salt Solution (HBSS), authors noted that HBSS demonstrated better results, even when the teeth were maintained for 12 h (17, 18). Viaspan exhibited better results when compared with HBSS (17–19). Blomlöf et al. (11) found preservation of 68% of the cells over the root when Eagle's solution was employed.

However, because of the easy access to milk in the moment of the accident and as 6 h are enough to look for a dentist, milk can be chosen as a short-term storage medium. Thus, taking into account the aforementioned aspects, the extraoral time and storage medium are essential factors for the success of reimplanted teeth (20, 21). After the injury, tooth avulsion should be correctly treated to ensure a better prognosis.

Children aged 7–11 years old are the most affected by dental trauma (3). So, professionals working with children should know the importance of emergency management and how to manage cases of tooth avulsion. In this study, it was noted that teachers knew the importance of emergency management (75.2%); however, just 18.8% would reimplant the tooth in the place of the accident. The majority of teachers would wash the tooth (55%) in tap water and maintain it in wet storage medium (42.7%), however milk was seldom mentioned (7.6%). This shows the lack of knowledge on tooth avulsion of teachers from Adamantina, São Paulo, Brazil.

These results are not isolated. Raphael and Gregory (22), in Australia, demonstrated the lack of diffusion of information on tooth avulsion. Hamilton et al. (23), in England, showed an unpreparedness of the respondents in cases of tooth avulsion. In 2001, Sae-Lim and Lim (24) highlighted the lack of knowledge of Singapore teachers on the emergency management of tooth avulsion. Chan et al. (25) noted that their results were similar to other authors. These studies demonstrate an unpreparedness of the community in cases of tooth avulsion.

The lack of knowledge on the management of tooth avulsion of teachers from Adamantina, São Paulo, Brazil was evident. An educational program should be organized to improve and teach professionals on the immediate management of tooth avulsion. A proposed dental health education package on the management of tooth avulsion should include and emphasize the following information: critical timing for reimplantation, specific storage media and consequences of tooth avulsion.

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