



Knowledge of dental avulsion management among dentists in Cuenca, Ecuador

Conocimiento del manejo de la avulsión dental entre dentistas en Cuenca, Ecuador

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ABSTRACT

Dental avulsion is a serious traumatic injury characterized by the complete expulsion of the tooth out of its alveolar socket. The response of dental personal to dental avulsion is very important and protocols on traumatic injury management should be known. The objective of this study was to determine the degree of knowledge of the management of dental avulsion of a representative group of dentists in the city of Cuenca, Ecuador. 183 dentists participated in the cross-sectional survey. Results highlighted that 42% of the surveyed dentists said that they had received some, but minor, information on dental trauma management, and 74.8% of those surveyed are not familiar with the recommended IADT protocols on traumatic injury management. The majority of participating dentists have a poor understanding of dental avulsion management, in contrast to the dental specialists in the surveyed population; the latter are clearly better able to manage this injury. Therefore, it is recommended that dental trauma should be included in the academic program in university schools of dentistry in Ecuador.

Keywords: Dental trauma management, tooth avulsion, traumatic dental injuries knowledge.

RESUMEN

La avulsión dental es una lesión traumática grave caracterizada por la expulsión completa del diente fuera de su cavidad alveolar. La respuesta del personal dental a la avulsión dental es muy importante y se deben conocer los protocolos sobre el manejo de lesiones traumáticas. El objetivo de este estudio fue determinar el grado de conocimiento de la gestión de la avulsión dental de un grupo representativo de dentistas en la ciudad de Cuenca, Ecuador. 183 dentistas participaron en la encuesta transversal. Los resultados muestran que el 42% de los dentistas encuestados dijeron que habían recibido cierta información, aunque menor, sobre el manejo del trauma dental, y que el 74.8% de los encuestados no están familiarizados con los protocolos recomendados de IADT sobre el manejo de lesiones traumáticas. La mayoría de los dentistas participantes tienen una mala comprensión del manejo de la avulsión dental, en contraste con los especialistas dentales encuestados; los resultados indican que estos últimos son más capaces de manejar esta lesión. Por lo tanto, se recomienda que el trauma dental se incluya en el programa académico en las escuelas universitarias de odontología del Ecuador.

Palabras clave: manejo de traumas dentales, avulsión dental, conocimiento de lesiones dentales traumáticas.

1. INTRODUCTION

Dental avulsion is a serious traumatic injury characterized by the complete expulsion of the tooth out of the alveolar socket, the tooth's supportive structure. The hard-dental tissue, especially the cement, the alveolar bone and gums can also be affected, and the blood vessels and nerves torn up and ruptured at the apex, what almost always leads to pulpal necrosis (Banchs & Trope, 2004; Flores *et al.*, 2007; Soares, Gomes, Zaia, Ferraz, & de Souza-Filho, 2008; Yanpiset & Trope, 2000). According to researches, dental avulsion represents between 1 to 11% of all dental injuries, and the teeth most affected are the upper central incisors (Trope, 2002; Tzigkounakis, Merglová, Hecová, & Netolický, 2008; Zhang & Gong, 2011). Studies indicate that the phenomenon is more common in men than women (Tzigkounakis *et al.*, 2008; Zhang & Gong, 2011). It could happen at any age; there are incident reports for those up

to 75 years old, although it is more common during childhood, between the ages of 6 and 15, with the average being 9.8 years old (Kargul & Welbury, 2009; Trope, 2002). For instance, more than 50% of all European children suffer a dental injury, for which the emergency treatment is usually carried out by a general dentist (von Büren, Krastl, Kühl, & Filippi, 2013). That is most likely due to the lack of risk awareness and the physical activities they perform; also, because the root and periodontal structures are still in the process of formation and very resilient (Sharma & Duggal, 1994). The main cause of dental avulsion is of traumatic origin such as falling off bikes, falling to the ground or stairs, criminal acts, traffic, sports and game accidents (Tzigkounakis *et al.*, 2008; Zhang & Gong, 2011). Furthermore, dental avulsion has physical and psychological effects that can compromise the normal development of an individual (Soares *et al.*, 2008; Traebert, Lacerda, Foster Page, Thomson, &

Bortoluzzi, 2012).

Although being a situation that has a great emotional impact on the person involved as well as those with them, a reimplantation that is immediately performed is considered the most important factor in its success, because if it is done after a period greater than 5 minutes, it is considered a late reimplantation, succeeding in preserving only 24% of the periodontal ligament cells. Other variables that influence the prognosis include the degree of root development, the mode of transport and the extra oral period (Andreasen, Borum, Jacobsen, & Andreasen, 1995). Even though the dentist is generally not at the site of the accident, the parents, trainers and teachers or whoever is with the victim should be able to perform first aid and seek medical attention from a qualified dentist, who should provide adequate and necessary care following established protocols. Following established norms, leaving aside personal opinions, will increase the probability of the survival of the tooth (Andersson *et al.*, 2012).

For the above-mentioned reasons, it is very important that the health staff such as nurses and medical doctor are prepared to bring the first aids and that the dentist is prepared to treat this trauma. Studies regarding the knowledge of the first aid of trauma cases found an appropriate level of knowledge of tooth avulsion in the population of nurses working at schools in Bialystok, Poland (Baginska & Wilczynska-Borawska, 2011). Nevertheless, in India, only 5.5% of the medical doctors knew about reimplantation and none knew that the patients' mouth was the best transport medium; 90% of them accepted that they had no knowledge on dental trauma management (Subhashraj, 2009). Keeping the tooth in saliva is the best option if Hank's Balanced Salt Solution (HBSS) is not available. Studies of knowledge of the dentist regarding avulsion found that in China there is a uneven pattern of knowledge between urban and suburban dentists regarding the emergency management of avulsed teeth (Zhao & Gong, 2010). In Norway, all Norwegian dentists study the treatment of dental trauma and the knowledge among dentist is in general good with some exceptions, but more information for diagnostic of external root resting is needed (Skaare & Jacobsen, 2005). In Lithuania, general dentists have insufficient dental traumatology knowledge (Zaleckienė *et al.*, 2018). Some factors related with the knowledge are younger age and hold a postgraduate degree (Baginska & Wilczynska-Borawska, 2011; França, Traebert, & de Lacerda, 2007; Skaare & Jacobsen, 2005; Zaleckienė *et al.*, 2018; Zhao & Gong, 2010).

The objective of this study was to examine the knowledge and management of dental avulsion among general and specialist dentists of the city of Cuenca, Ecuador, and to determine if they know the protocols recommended by the IADT for traumatic injury management.

2. METHOD AND MATERIALS

In October 2012, 183 dentists of the city of Cuenca, randomly selected from private dental practices, dental centers and hospitals, were subjected to a cross-sectional survey. The participating dentists were visited in their

practice. The dentists' knowledge about dental avulsion was tested by means of a questionnaire (Zhao & Gong, 2010). The first part of the questionnaire was focused on collecting general information of the participating dentists such as the level of education, number of years of practical experience, whether they have had training in dental avulsion, and if they know the IADT¹ protocols regarding dental trauma management. The second part of the questionnaire aimed at evaluating dentists' knowledge about the emergency management of avulsed teeth. Questions such as: Do you know the IADT guidelines for the management of traumatic injuries? What is dental avulsion? What is the ideal time for reimplantation of an avulsed tooth? How should the tooth be stored and transported? During the treatment which type of medication should be used? Is it necessary to splint after implantation? If your answer is affirmative, how would you proceed? Would you reimplant an avulsed permanent tooth, in all cases? Would you reimplant a milk tooth? among other questions. All questions were multiple choice questions with multiple answers.

The survey was taken without giving any previous information to those being surveyed, so that the information obtained would be as real as possible, as happens in emergency care situations. Once the survey was finished, the envelopes were sealed. The researchers rated the responses of each of the respondents. The sum of all the hits gave the score. The obtained information was analyzed through descriptive (percentages) and inferential statistics (chi-square test). The data were analyzed using Epi Info 2008.

3. RESULTS

The first part of the questionnaire revealed that 36% of the surveyed dentists have between five and ten years of experience, 33% less than 5 years and 26% more than 10 years. Figure 1 depicts the percentage of respondents possessing a graduate degree (51.4%) and their specialty, covering different areas. The majority of the dentists possess a specialized degree in orthodontics (20%) and oral rehabilitation (15%). Regarding the question of having received dental trauma management training, only 42.6% of the surveyed population responded affirmative, and regarding knowledge of IADT protocols for trauma management only 19% expressed to be acquainted with these protocols, indicating that familiarity with the IADT protocols is not a general phenomenon.

The second part of the questionnaire, that focused on the probing of specific dental avulsion knowledge, 95.6% of the surveyed dentists expressed to know what dental avulsion is, and 52.4% of the respondents correctly indicated the ideal time for reimplantation. When asked about the ideal storage medium 34.9% believe that placing the tooth in the mouth of the patient (saliva) is the best mode of transport, 22.4% think that it is saline solution, 19.1% fresh milk and only 18% chose Hank's Balanced Salt Solution (HBSS), which is the best option. Previous could be explained by the dentists' lack of knowledge of its existence. 66.6% of those surveyed are clear that the objective of dental avulsion is to avoid necrosis of the periodontal ligament cells. During the root canal

¹ International Association of Dental Traumatology

treatment, which should be done after a few days, 68.3% would use a medication with a calcium hydroxide base, while 8.74% consider that any medication is necessary. With respect to the use of a splint or mouth guard, 97.8% consider it necessary to use one, however, 53.5% would choose a rigid splint, which is not recommended in these cases; only 39.3% would use a flexible splint. The ideal amount of time to use the splint, which is up to two weeks,

was chosen by only 25.6%. We were also able to identify that 34.9% of the respondents correctly consider the dry extra alveolar time as the most important factor in the treatment and prognosis of dental avulsion, while 24.5% consider it to be the storage medium. Regarding the reimplantation of the tooth, 61.20% would not reimplant in any case and 81.4% would not reimplant a temporary tooth.

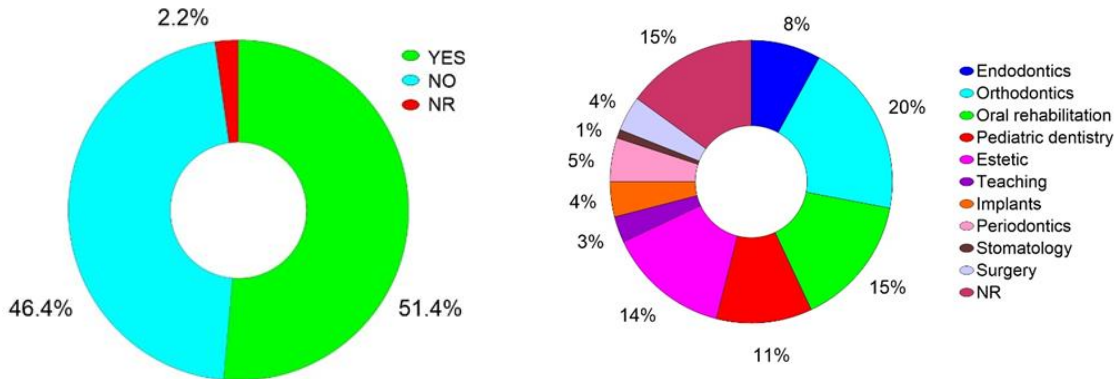


Figure 1. Left: Percentage of general dentists (NO) and dentists with a postgraduate degree (YES); Right: Field of specialization during postgraduate studies. NR = Percentage of respondents who did not respond to the question.

Table 1. Degree of knowledge in general dentistry and dentists with specialization.

Qualification	Good # (%)	Poor # (%)	Total # (%)	Chi-sq value	p-value
General dentist	25 (29.4)	60 (70.6)	85 (100)	11.71	0.0006
Dentist with postgraduate degree	51 (54.3)	43 (45.7)	94 (100)		
Less than 10 years of practice	28 (60)	19 (40)	47 (100)	5.28	0.02
More than 10 years of practice	50 (40)	75 (60)	125 (100)		

Chi-square at 0.05 level of significance

4. DISCUSSION

Providing adequate treatment when presented with a case of dental avulsion, taking into account all possible variables, such as the degree of root development, the amount of time that has passed since the avulsion, the storage medium, etc., is a challenge for dentists that in general do not treat trauma cases often enough to be familiar with the proper procedures. As such, dentists should be knowledgeable of the protocols recommended by the organizations at the forefront of dental trauma management on a world scale, one of them being the IADT. In our study, 74.8% of those surveyed are not familiar with the recommended IADT protocols, and only 43% of those surveyed received some type of information regarding dental trauma management, which concurs with the results obtained by Subhashraj (2009) in which the majority of those surveyed accept that their knowledge of trauma management is inadequate. In their study, Holan & Shmueli (2003) stated that less than half of the surveyed population of dentists said they had received information on dental avulsion treatment.

Our results show that dentists with less than ten years of professional experience have the best understanding of dental avulsion management, probably because young professionals have a greater ability to access sources of information. This conclusion coincides with the findings of Vasconcellos *et al.* (2009) and Krastl, Filippi, & Weiger

(2009), but not with the results obtained by França *et al.* (2007). Those authors found that the majority of correct responses were given by dentists with more experience.

34% of those surveyed responded that the ideal transport medium is saliva, results that coincide with those obtained in previous investigations, aside from not being the ideal transport medium. Only 18% mentioned Hank's Balanced Salt Solution as the ideal option, which we assume is due to the lack of knowledge about this substance in our field of dentists. Fortunately, no one of the surveyed population chose placing the tooth in water or paper, a strategy that is absolutely ill-advised. 66.66% of those surveyed correctly stated that the purpose of the storage medium is to preserve the vitality of the periodontal ligament cells (Tziggounakis *et al.*, 2008; Zhao & Gong, 2010). 68.3% of those surveyed said that the medication that should be used is calcium hydroxide.

97.81% of those surveyed accurately said that splinting the reimplanted tooth is necessary, unfortunately, the majority (53.55%) wrongly said that a rigid splint should be used, which coincides with the results published by Zhao & Gong (2010), but different from the findings of Westphalen *et al.* (2007) and Vasconcellos *et al.* (2009) where the majority of those surveyed said that the semi-rigid or flexible splint should be used. In our study only 39.34% chose the flexible splint. 30.6% said that a splint should be used for 30 days, which coincides with the results of Zhao & Gong (2010) and Westphalen *et al.* (2007), while 25.68% answered it should be used for up to

two weeks, which is what the IADT recommends. This shows us that there is an important lack of understanding regarding the type of splint to be used and the ideal time of use. The prognosis of a reimplanted tooth depends on many factors, one of which is the dry extraoral time. In our study less than half of those surveyed, 34.97%, said that this was the most important factor.

When knowledge of trauma was checked against the years in the profession (see Table 1), a chi-sq value of 5.28 and p-value of 0.02 were obtained, a statistically significant value, that is, the fewer the years of experience, the better the management of trauma. This is contrary to the study of França *et al.* (2007) who determined that those with more years of experience have a better understanding of trauma management. 70.6% of general dentists do not have a good understanding of trauma, results that agree with the study conducted by Krastl *et al.* (2009) in Germany, who concluded that general dentists have a poor understanding of trauma management. According to our study 54.3% of the surveyed specialists have a good understanding of trauma. When knowledge of trauma of general dentists was compared with that of specialists the chi-sq value was 11.71 with a p-value of 0.0006, indicating that there is a significant difference, that is to say, those that have a graduate education have a better understanding of trauma management.

5. CONCLUSIONS

From the study it can be concluded that the surveyed dentists have a poor understanding of dental avulsion management and that the majority are not familiar with the recommended IADT protocols, which makes the inclusion of dental trauma in the academic program of Ecuadorian university's schools of dentistry of fundamental importance. Knowledge of trauma protocols and its management should be made known to the greatest number possible of dentists and health professionals as well as to those that have constant contact with children, such as teachers, trainers, etc., through conferences, workshops, short term academic courses, and the communication and dissemination of information.

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