Knowledge and Awareness of First Aid of Avulsed Tooth among Physicians and Nurses of Hospital Emergency Department

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INTRODUCTION

Various epidemiological studies have reported dental trauma to be a significant problem which is expected to overshoot the incidence and prevalence of dental caries in young children.\(^1\)

Dental trauma in young children is often seen to occur accompanying trauma of orofacial region with varying range of complexities. This could vary from simple concussion to extensive maxillofacial damage involving periodontal structures or avulsion of teeth.\(^2\)

Among the dental injuries, avulsion of tooth is considered to be the most severe form of injury with a wide array of consequences affecting the dental and overall development of child, thus demanding prompt organized approach. Children in the age group of 1–2.5 years sustain injury to primary dentition whereas injury to permanent dentition is noted mainly in 8–10 years of school going children. The reported incidence of avulsion is 0.5%–3% of all traumatic dental injury, and the prevalence of avulsion is three times more in boys than girls mainly attributed to participation in active sports.\(^3\)

Nothing can be more distressing for the child as well as parents than losing permanent anterior teeth which in turn affects the psychological development of the child along with its effect on esthetics and functions, following which there is often conscious effort to avoid smiling and social interactions.\(^4\)

Although there are various modalities to replace a lost tooth, the role of immediate reimplantation is still the most preferred and desired by parents, child, and clinicians.\(^5\)

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The reported success rate in immediate reimplantation ranges from 85% to 97% depending on the stage of root development. However, the success rate is dependent of factors such as extra-alveolar time in turn viability of periodontal ligament, storage and transport media, type of splinting, time of endodontic intervention, and oral and general health status.\[6,7\]

Many avulsed teeth are lost because of ignorance regarding first aid procedure to be provided. Parents, school teachers, and physical educators are often the first to discern visually the incident, but with deficient oral workforce in the emergency department, physicians, and nurses are the first responders providing primary treatment. With intervention by various authors, awareness is increased among parents, school teachers, and physical educators. Still, lacunae prevail among emergency department personnel as traumatic dental injuries are of low priority to be addressed.\[6,7\]

Literature lacks any data regarding knowledge and awareness among emergency personnel in India; hence, this study was planned to evaluate the knowledge and awareness among physicians and nurses regarding first aid in dental avulsion.

**Materials and Methods**

This cross-sectional observational questionnaire-based survey was done in fifty hospitals’ emergency department across Odisha, involving 150 emergency department personnel including physicians and nurses who readily agreed. The Institutional Ethical Clearance was taken, and permission from hospital authorities was obtained. Written informed consent form was procured from physicians and nurses after explaining the purpose of the study.

The survey was voluntary and strict confidentiality was assured. All the questions were close-ended multiple-choice questions involving basic knowledge about dental avulsion and case-based scenarios to assess the awareness and readiness to address the situation. Questionnaires were given to participants under the supervision of the authors to ensure completeness and authenticity. Furthermore, the authors were always present at the time questionnaires were completed and collected immediately after answering. The data thus obtained were analyzed to obtain percentages and also subjected to statistical analysis using SPSS version 16.0 (SPSS Pvt. Ltd., Chicago, IL, USA) for descriptive analysis and Pearson’s correlations with significance level set at 0.01 level.

**RESULTS**

All the emergency department personnel (150 each of physicians and nurses) who were approached readily agreed to participate and filled questionnaire were returned on the same day (response rate = 100%).

Personnel posted in the emergency department were of heterogeneous group with 58% physicians and 43% nurses having >5 years of clinical experience.

About 74.7% physicians and 66.7% nurses have had previous experience with dental trauma, and 60% nurses and 65.3% physicians considered avulsion as the most severe form of dental injury [Figure 1].

Nearly 74.7% physicians and 66.7% nurses were aware of the concept of reimplantation but lack of knowledge regarding factors affecting prognosis. Mixed response was obtained for urgency of timing of reimplantation. About 40.7% nurses and 53.3% nurses recommended immediate attention whereas 34.7% nurses and 21.3% physicians suggested to be done within 10–15 min [Figure 2].

Response regarding handling of avulsed tooth showed that 50% physicians considered saline and 30% suggested antiseptic/alcohol as suitable for cleaning the tooth, whereas among nurses responses were split into two almost equal moieties with 35.3% suggesting saline and 37.3% advocating antiseptic/alcohol [Figure 3].

A great deal of confusion was seen among respondents regarding transport media. Thirty-six percent physicians and 22% nurses suggested milk and 35.3% physicians and 38.7% nurses preferred saline [Figure 4].

About 66.7% physicians and 60% nurses have attended some course or educational program pertaining to the management of dental trauma. But still, they lack confidence to attempt reimplantation. Ninety-three percent nurses and 87% physicians preferred referring or calling the dentist to do the needful treatment.

There was unison in response with 92% physicians and 80% nurses for the need of education program in the emergency management of dental trauma whereas still
there were some who considered knowledge regarding first aid of avulsion of tooth as unimportant.

**Discussion**

Loss of permanent anterior teeth in young children often leads to coalition of pain, emotional affliction, shock, and physical ruination with potential of producing dental anxiety in future.[8]

Advancement in materials and methods has provided various modalities for replacing the lost permanent tooth. However, in young children with ongoing growth and development of jaw, permanent replacement by means of bridge or implant is not recommended.[9]

Preserving the natural is emphasized by parents, desired by the child and now intended by the dentists as well. Thus, immediate reimplantation of avulsed tooth followed by endodontic treatment is best treatment modality. The success and prognosis of reimplanted tooth is dependent on various factors as advocated by various authors which include minimal extraoral time, adequate storage, and transport media along with minimal damage to root surface and periodontal ligaments.[10,11]

Even though number of dental clinics and hospitals has increased over the past decade, still medical hospital remains the first reporting point following orofacial injury. As the emergency department personnel including physicians and nurses are in the front arena for providing the primary treatment, their knowledge and awareness regarding first aid measures in tooth avulsion is detrimental in predicting the outcome.

There are a few reports of knowledge among physicians, but literature is deficit in reports of any articles involving nurses. They are not only a constituent part in every emergency room providing treatment, assisting physicians but also responding to emergency phone calls reporting the accident; hence, knowledge and awareness among nurses also plays a pivotal role in determining the success of treatment. Keeping the aforementioned points, this questionnaire survey was undertaken to assess and evaluate the awareness and knowledge among emergency department personnel regarding first aid in tooth avulsion.

With 100% response rate, the findings of the survey showed fair knowledge among physicians and nurses about first aid in dental avulsion. These results were harmonious with the previous study involving emergency department physicians.[12] but contrasting to the results obtained by Pani et al. reporting the lowest awareness about dental trauma first aid.[7]

It was propitious to know that target groups were aware of types of dental trauma and 60% nurses and 65.3% physicians graded tooth avulsion as the most severe form of dental injury. Furthermore, the majority of them had encountered with dental trauma in their previous practice.

Regarding the important question of reimplantation, both groups agreed on preserving the natural teeth. However, 33.3% nurses and few physicians 25.3% regarded it as superfluous. The obtained proportion was higher than the study by Holan and Shmueli, which reported that only 4% physicians thought avulsed permanent incisor should be reimplanted and 50% of them would not replant under any circumstances.[13]

Concerning the urgency or promptness of reimplantation, there were varied opinions among the groups. More than half of the physicians, 53.3% recommended immediate referral and reimplantation. Mixed responses were obtained among the nurse’s groups with 40.7% advocating immediate attention, and 34.7% favored delaying up to 10–15 min. This observation was in concord with the only study by Yunus et al.[14] involving nursing students, in which 30% responded critical time for replantation to be within 20 min.
In accordance with previous reports, in our study, lack of knowledge regarding cleaning medium to be used for contaminated tooth was evident. Fifty percent physicians suggested normal saline whereas nurses preferred normal saline (35.3%) and antiseptic/alcohol (37.3%) in similar proportions.\textsuperscript{[5,8,15]}

Addressing another important question determining prognosis and revitalization, 35.3% physicians and 38.7% nurses considered saline as the best medium for storage and transport. Very few nurses (2.6%) were aware of patient’s saliva to serve as storage media. This finding was similar to as reported by Subhashraj in 2009. However, differed from it in the aspect of considering milk as storage media, it reported that <5% knew that milk can serve as a good medium for transport, in contrary, we found that 22% nurses and 36% physicians considered milk to be more viable and appropriate option.\textsuperscript{[8,16]} Hugar et al. also concluded extremely low level of awareness among Indian nurses with mere 2.2% knowing about storage media.\textsuperscript{[17]}

Although Hank’s balanced salt solution has been proven and validated as ideal storage and transport media, it was not included in answering option because of its unavailability in India and owing to its cost, making it a difficult nonviable option for practical use on site.\textsuperscript{[8]}

Only 33.3% physicians and 40% nurses had received any advice/training related to first aid of dental avulsion. There was negligible correlation between career experience and their knowledge about the first aid of dental avulsion \((r = 0.116, P < 0.001)\). However, strong positive correlation between respondents who had received prior training and their knowledge in the questionnaire \((r = 0.0826, P < 0.001)\) was recorded. This finding was similar to study by Nasr et al., however, in that doctors’ attitude and awareness about the management of dental injuries as whole was a consideration.\textsuperscript{[18]}

Parallel responses were obtained in regard to question concerning referral to dentist or attempting self to reimplant with majority physicians (87%) and nurses (93%) preferred calling or referring to dentist desirable. Lack of knowledge and confidence in providing first aid in dental avulsion could be partly attributed to lack of exposure and training, exclusion of clinical dentistry from medical curriculum and to some extent because dental trauma still is not considered as prime concern in the emergency department.

There were certain limitations, as the present study was exploratory in nature with a subjective questionnaire including limited number of participants, thus the responses obtained cannot be generalized. Furthermore, there was no reported study relating to nurses thus comparative evaluation and discussion remain as lacunae.

**Conclusion**

However, the study clearly discerns an interstice in knowledge and awareness of emergency department physicians and nurses regarding dental avulsion and this demands an effort to formulate educational program to permeate the prevailing lacunae, thus raising overall standard of emergency care through more seminars and workshops in common forums, its inclusion into the curriculum of medical and nursing and most importantly addition in the programs and courses addressing emergency and accident care and management.

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**Conflicts of interest**

There are no conflicts of interest.

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