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Cognizance of sports related dental injuries amongst paediatric age group players

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Abstract

Introduction: Adolescents participate in sports activities that involve traumatic dental injuries while playing, which are a major health problem. Sports dentistry includes the prevention and management of orofacial injuries and associated oral diseases.

Aims: To assess awareness of traumatic dental injuries, knowledge of preventive measures and management of such injuries during playing sports.

Materials & Method: A total of 400 sports playing children aged 10 to 16 years, children enrolled in a sports academy, were able to understand the English language, played sports having a risk of TDI's were selected. A questionnaire was prepared, having specific data about knowledge, awareness and prevention of sports-related TDI's were distributed to the participants. The collected data were tabulated and analysed statistically.

Results: A total of 400 children aged 10 to 16 years participated in the study. Out of the total, 32.25% of participants in the study played contact/collision type of sports. A total of 41.75% of participants answered that they had injury to teeth while playing. Out of the total participants, 45.75% responded that they will wash the tooth with tap water, immediately when teeth will be knocked out while playing. Of the total participants, 38.75% answered that they would carry the avulsed tooth in water, 32% wrapped in cloth and 6.75% answered in mouth/saliva. Out of the total participants,

48.25% were having knowledge about prevention methods for the traumatic injury.

Conclusion: Higher prevalence of traumatic dental injuries was found in contact/collision sports playing children but awareness was low regarding about management and prevention of such injuries.

Keywords: Knowledge, Sports, Traumatic dental injuries, Mouthguards.

Introduction

Playing sports is healthy and beneficial, however, individuals are at risk of dental trauma, with the possibility of injury to the teeth and soft tissues.[1] Sports dentistry encompasses the recognition of the injury-prone dentition and management of dental injuries.[2] Direct contact sports such as boxing, basketball, soccer, and volleyball pose a higher risk to dental trauma, such as crown fracture, root fractures, avulsion etc.[1]

TDIs encompass injury to teeth or the oral cavity caused by an external impact on the teeth and surrounding tissues. Despite of various safety measures, the sports related TDIs are prevalent among the sports person.[3] Upper central incisors are the teeth more frequently affected by trauma, possibly because of their position in the mouth, being less protected than other teeth according to Garg et al. (2017).[4] Also, El- Kalla et al. (2017) stated that predisposing biological factors for TDI include increased overjet and inadequate lip coverage.[5]

A lot of scientific evidence is available globally, however, no such evidence has been reported about this demographic population regarding Mahakaushal region, Madhya Pradesh. Furthermore, this study attempts to define the specific characteristics and pattern of traumatic dental injuries and also about the knowledge on how to prevent such injuries. Hence, the aim of this study was to evaluate the prevalence of dental injuries in sports playing children aged 10 to 16 years and to know the level of knowledge and awareness of the participants for preventive measures and management of dental trauma during sports.

Materials and Methods

The cross-sectional study was done from August 2018 to October 2018 to assess the awareness, knowledge and prevalence of traumatic dental injuries of children playing in the Sports Academy of India, Jabalpur Branch, Jabalpur (M.P.), India, after obtaining permission from the authorities. (Letter no- 05/2018) The sample size was calculated to give a standard error of 5.0%. A 95% confidence interval level was taken and 384 participants were considered as the minimal sample size of the present study. The sample was increased by 10%, totalling 422 children, in order to compensate for possible losses during the survey. The sample size was larger than minimum due to the excellent response. Out of 422 participants, 22 didn't gave the consent to participate in the study and were excluded from the study.

A total of 400 children aged 10 to 16 years who played sports involving the risk of traumatic dental injuries, who gave consent for the study, who were able to read and write the English language were selected for the study. A questionnaire was developed having questions about awareness and knowledge of management of TDI and prevention of such injuries. After the approval of the Institutional Ethical Committee of Hitkarini Dental College and Hospital, Jabalpur (M.P.) (Letter no: HDC&H/2018/2576) was obtained, the questionnaire was distributed to the children. They were asked to mark appropriate answers according to them. The first part was demographic data including name, gender, class, school and address of the participants. The questionnaire includes 10 questions about the type of sports that

children are involved in; the history of previous injury; whether it was possible to reimplant the avulsed tooth or not; extraoral time required for reimplantation; storage media; and if they had any knowledge regarding prevention methods for traumatic injuries. The data was tabulated and analysed statistically.

For statistical analysis, data were entered in Microsoft Excel 2016 for Windows. Data analyses were performed using version 21.0 of the Statistical Package for Social Sciences (IBM Corporation, Armonk, New York, USA). Frequencies and percentages of responses were calculated and a Chi-square test was performed. The statistical significance was set at 0.05.

Questionnaire:

Department of paediatric and preventive dentistry Hitkarini dental college and hospital, Jabalpur

Questionnaire

S. No.: **Date:**

Name: **Age/Sex:**

School:

1. Type of sports in which you participate: (Goswami M et al., 2017)

Contact/collision (Football, Martial arts, Wrestling, Boxing)

I. Limited Contact/impact (Basketball, Cycling, Gymnastics, Skating, Squash, Volleyball)
II. Strenuous contact (Tennis, Weightlifting, Swimming)
III. Moderately strenuous contact (Badminton, Table tennis)
IV. Non-strenuous contact (Archery, Golf)

2. Did you injured your teeth while playing? Yes/No
3. If yes, what type of injury you had:
   I. I broke part of my tooth.
   II. I broke my whole tooth.
   III. Tooth become loose/ mobile
   IV. Tooth fell off the mouth
4. Did you have any injury to your lips alongwith your teeth? Yes/No
5. What did you do when your teeth come out while playing?
   I. Placed the tooth back;
   II. Washed your tooth with tap water
   III. Cleaned your tooth
6. According to you, till what time teeth should be placed back in its place? (Kaul R et al. 2017)
   I. Immediately;
   II. Within 30 min;
   III. Within 1 hour;
   IV. Within 5 hours;
   V. Within a day.

7. If you will go to the dentist, how will you carry your tooth to the dental clinic?
   I. Wrapped in cloth, paper
   II. In mouth, saliva
   III. Water
   IV. Don't know
8. Did you know about any prevention methods for protection of your teeth? Yes/No
9. Did you know about mouthguards? Yes/No
10. Did you use mouthguards? Yes/No

Signature:

Date:

Place:

Results

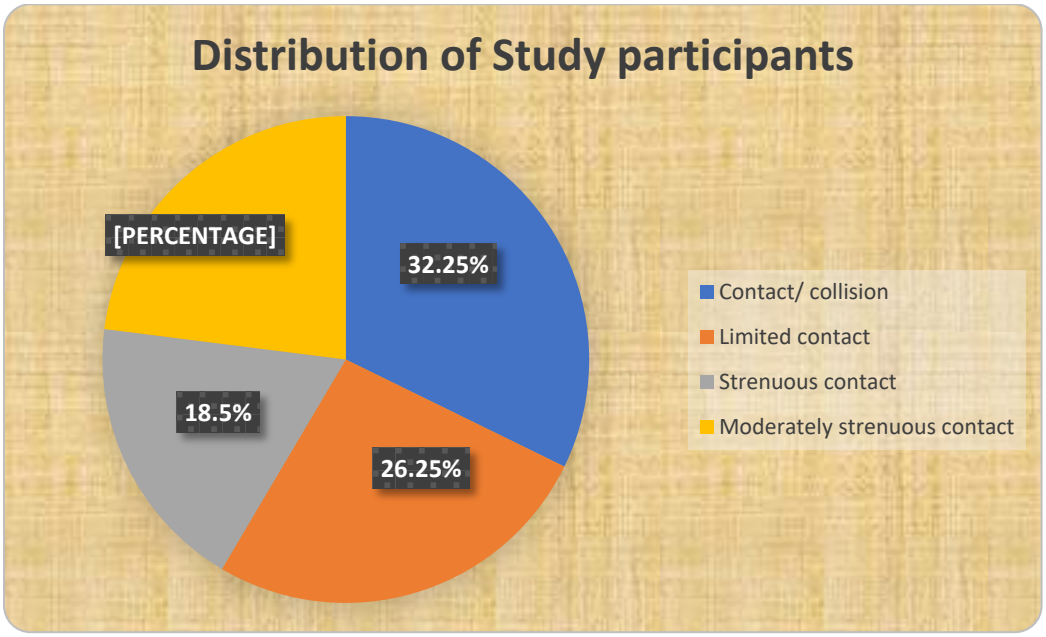
A total of 400 children aged participated in the study aged 10 to 16 years with a mean age of 12.94 ± 1.84 years. Out of which, 202 (50.50%) were males and 198 (49.50%) were females. Out of total participants, 129 (32.25%) of participants in the study played contact/ collision type of sports, followed by limited contact 105 (26.25%) sports, moderately contact sports 92 (23%) and strenuous contact 74 (18.50%) sports. (Graph 1)

A total of 167 (41.75%) participants answered that they had injury to teeth while playing. Out of these participants, 111(66.4%) boys and 56(33.5%) girls had injuries to teeth. A total of 70 (41.9%) children of age 12 to 16 years had the highest percentage of injuries followed by 54 (32.3%) and 43 (25.7%) of 14 to 16 years old and 10 to 12 years old age group children respectively, which was found to be statistically non-significant. (p=0.52) (Table 1)

Out of participants having injuries to teeth while playing, 72 (43.11%) had a history of mobility of teeth, 32 (19.16%) had a fracture of teeth, 29 (17.37%) had suffered avulsion and 24 (14.37%) had chipping of teeth while only 10 (5.99%) had other dental injuries. (Table 2).

Of the total participated children, in case of avulsion, 183 (45.75%) responded that they will wash the tooth with tap water immediately while 118 (29.50%) responded that they will place the tooth back in the mouth and only 99 (24.75%) responded that they will clean the tooth. (Table 3) Out of the total participants, 108 (27%) answered that within 30 minutes the avulsed teeth should be placed back in its place, while 78 (19.50%) said within a day, 74 (18.50%) said within 5 hours, 72 (18%) said within 1 hour, while only 68 (17%) said teeth should be placed immediately. (Graph 2)

Of the total participants, 155 (38.75%) answered that they would carry the avulsed tooth in water, 128 (32%) wrapped in cloth, 27 (6.75%) in mouth/saliva. (Table 4) Out of the total participants, 193 (48.25%) were aware of any prevention methods for the protection of teeth. Of the total participants, 96 (24%) had knowledge of mouthguards. (Table 5)



Graph 1: Distribution of study participants according to type of sports

Table 1: Responses of study subjects for injury to teeth:

Age (in yrs)	Males (n%)	Females (n%)	(n%)	Chi square value	p value (0.05)
10-12	31 (72)	12 (28)	43 (25.7)	1.32	0.52
12-14	47 (67.1)	23 (32.8)	70 (41.9)		
14-16	33 (66.1)	21 (38.8)	54 (32.3)		
Total	111	56	167		

Table 2: Responses of study subjects for type of injury to teeth while playing:

Type of injury	Males n (%)	Females n (%)	n (%)
Part of tooth broke	11 (45.8)	13 (54.1)	24 (14.37)
Whole tooth broke	24 (75)	08 (25)	32 (19.16)
Tooth become loose / mobile	58 (80.5)	14 (19.4)	72 (43.11)
Tooth fell off mouth	13 (44.8)	16 (55.1)	29 (17.37)
Others	03 (30)	07 (70)	10 (5.99)
	111 (66.4)	56 (33.6)	167 (100.00)

Table 3: Responses of study subjects for immediate action when teeth came out while playing

Responses	n (%)
Place the tooth back	118 (29.50)
Wash the tooth with tap water	183 (45.75)
Clean the tooth	99 (24.75)
Total	400 (100.00)

Graph 2: Responses of participants for time available to place the tooth in its place

Table 4: Responses of participants for method to carry avulsed tooth to the dental clinic

Responses	n (%)
Wrapped in cloth / paper	128 (32.00)
In mouth / saliva	27 (6.75)
Don't know	90 (22.50)
Water	155 (38.75)
Total	400 (100.00)

Table 5: Knowledge of prevention methods for the protection of teeth and knowledge about mouthguards

Responses / Questions	Responses		Total n (%)
	Yes n (%)	No n (%)	
Knowledge about prevention methods for protection of teeth	193 (48.25)	207 (51.75)	400 (100.00)
Knowledge about mouth guards	96 (24.00)	304 (76.00)	400 (100.00)

Discussion

Engaging in any type of physical activity has health benefits but it also has a potential risk for injury.[6] Sports activities are associated with injuries that include orofacial soft and hard tissue. Trauma and such accidents often have life-long consequences. Dental injuries are mainly caused by hits to facial area with the rackets or by collision with the opponent because of high velocity and close contact. Sports-related dental injuries have accounted for a high percentage among all types of traumatic injuries across the world.[7] In this study, 32.25% of participants played contact/collision type of sports, followed by limited contact 26.25 % sports, moderately contact sports 23% and strenuous contact 18.5% sports. The study corroborated with Tiwari V et al. (2014)[8] among 12 to 22 years old children where the prevalence among contact athletes was 39.1% which could be because these sports involve children to

physically interact with each other, trying to prevent the opposing team or person from winning, which results in direct injury to teeth.

A total of 41.75% of participants answered they had injury to teeth while playing which could be attributed by saying that adolescents of this age group are involved in more physical activity. The highest percentage of injuries was seen in 12 to 14 years age group children (41.9%), which was found to be statistically non-significant when compared with other age groups i.e. 14 to 16 years (32.3%) and 10 to 12 years old (25.7%) which could be attributed by saying that as adolescents of this age group are more involved in aggressive training and have a tendency to take the risk during the sport.

In the present study, increased frequency was seen among boys than girls which was 66.4% but a statistically non-significant difference was found. (p= 0.52) These results are similar to study done by Gupta S et al. (2011)[9] and Reddy et al. (2017)[10] where they have found boys have suffered more TDI than girls (65.9% and 67.2%) respectively, which could be attributed by saying that boys are more energetic and aggressive while playing, which often results in injuries. Whereas, in a study done by Singh G et al. (2014)[7], they found more prevalence of injuries in girls than boys (32%).

Out of the participants who had an injury to teeth while playing 43.11% had a history of the mobility of teeth, 19.16% had experienced a fracture of teeth, 17.37% suffered avulsion and 14.37% had chipping of teeth/fracture. Similarly, in a study done by Goswami et al. (2017)[2] and El- Kalla et al. (2017)[5] 25.5% and 2.2% of sports playing children experienced avulsion respectively. In the present study, 17.37% had suffered avulsion. The tooth should always be replanted after tooth avulsion, which is complete displacement of the tooth from its socket. The immediate replantation, which should be performed within 15 minutes after tooth avulsion, maintains a greater quantity of vital cells on the root surface, flavouring the prognosis.[1]

Out of the total participants, 45.75% responded that they will wash the tooth with tap water, immediately when came out while playing and 27% answered that within 30 minutes the avulsed teeth should be placed back in its place. If immediate replantation is not possible the avulsed tooth should be stored in proper storage media which maintains the vitality of cells present on the root surface for longer time.[11] When participants were asked about carrying their tooth to the dental clinic, most of the participants opted water (38.75%) as the prime choice followed by wrapped in cloth (32%) and saliva (6.75%). However, due to inadequate knowledge about managing the tooth, it is not stored in any medium or is not brought back to the dental surgeon for immediate replantation which leads to further complications and complete loss of the traumatized tooth.[1] Inadequate awareness of children involved in sports activities can be attributed to these results, which are similar to the study by Goswami et al (2017[2] where 8.3% of participants chose a liquid medium for avulsed tooth storage.

Sports dental injuries can be avoided with adequate educational and preventive measures, such as the use of mouthguards which provide a resilient, protective surface to distribute and dissipate transmitted forces on impact and thus, reduce the incidence of orofacial injuries.[12] Out of the total participants, 48.25% were aware of any prevention methods for the protection of teeth. Only 24% h a d knowledge about the use of mouthguards while playing sports. Similar results were obtained in a study done by Tiwari V et al. (2014)[8] and

Singh G et al. (2014)[7] where 51.5% and 46.20% of athletes were aware of mouthguards.

Sports authorities and dental professionals can work as a team to increase the awareness, knowledge and promote the use of preventive measures among contact sports playing children having an increased prevalence for TDI's. The present study had limitations as only one sports academy was selected and with limited participation of sports playing children. Also, as only the adolescent age group was selected, the patterns and severity of injuries could not be well described. So, a more intensely focused and controlled research is much needed in future.

Conclusion

Early identification of injuries and the availability of evidence-based interventions are the key factors for sports related traumatic dental injury prevention and treatment. It is recommended that the educational programs should be initiated for the community regarding the prevention of traumatic dental injuries. This study revealed a relatively high prevalence of dental trauma among sports playing children but the awareness about management and prevention of TDI has been found as low.

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