

## **A Retrospective Study of Traumatic Dental Injuries in Children of Central Kerala, India.**

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**Abstract:** A Traumatic dental injury varies widely in its etiology and pattern across different demographic regions and societies. Gaining popularity of active life styles increase the risk of sustaining traumatic dental injuries in all age groups. This increase in risk, combined with the lack of awareness among the society about emergency management and sequelae of traumatic dental injuries, often compromises the prognosis of treating such injuries. The etiology and pattern of traumatic dental injuries sustained during the primary and mixed dentition period among the patients reporting to Government Dental College, Kottayam were evaluated retrospectively in this study. Data of children upto the age of 15 years were examined retrospectively of a 10 year period from 2017 and were divided into age groups based on their social environment and activities. The 0-2 year age group were mainly under parental or home care, 3-6 year olds were in kindergartens, 7-12 year olds were in primary schools and the 13-15 year age group were in high school classes. Concussion was found to be the most prevalent type of dental injury, falls were the most common etiology and maximum number of cases reported was from the primary school going age group of 7-12 year olds.

**Keywords :** Traumatic dental injury, Awareness, Concussion

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### **I. Introduction**

Traumatic injuries of the oral cavity have become a significant public health problem. A traumatic dental injury (TDI) is an impact injury to the teeth, other hard and soft tissues within and around the vicinity of the mouth and oral cavity.<sup>1</sup> It is usually sudden and often requires emergency care. Although these injuries are seen more in certain age groups, it is a major health hazard as no individual is ever at zero risk at sustaining a TDI through their activities of daily living. TDI has an impact on economic productivity and quality of life of patients by impairing chewing, speech, aesthetics as well as physical and psychological conditions.<sup>2</sup> In primary dentition, studies reported a prevalence of TDI ranging from 9.4%-71.4%.<sup>3</sup> The prevalence rate of TDI in permanent teeth ranged between 6.1%-58.6%.<sup>4</sup> Approximately 50% of children are exposed to TDI in childhood and adolescent period.<sup>5</sup> TDI and their consequences may exceed the burden of caries and periodontal disease in the young population.<sup>6,7</sup> So there is an urgent need to see patterns of TDI in children in order to assure more preventive oral health care and to improve the quality of life of children.

### **II. Method**

The present cross sectional retrospective study was carried out in the department of Paediatric and preventive dentistry, Govt Dental College, Kottayam. Patients from both urban and rural areas from central part of Kerala were seeking treatments at this centre. Records of patients treated during a ten year period were evaluated. Patients' records in which a complete TDI history was recorded were included in this study and those with incomplete records were excluded. Total of 800 children up to 15 years of age were selected retrospectively. The following information was collected from the patient's record like socio economic data, tooth fracture, concussion, luxation, avulsion and soft tissue trauma. The data were analysed using SPSS 19. Chi square test was carried out and regression analysis was performed to verify the association between variables.

### **III. Results**

After verification of hospital records, 800 patients were included in the study (boys 66.2% and girls 33.7%). Patients up to 15 years of age were included in the study in groups of 0-2, 3-6, 7-12 and 13-15 years of age. Table-1 displays distribution of demographic variables and cause of injury.

**Table -1**

Variable		n( %)
Gender	Male	530(66.2)
	Female	270(33.7)
Age	0-2years	210(26.25)
	3-6years	190(23.75)
	6-12 years	330(41.25)
	13-15years	70(8.75)
Etiology	Fall	192(24.2)
	Sports	175(21.87)
	Collision	160(20)
	Road traffic accident	122(15.25)
	Bicycle accident	72(9)
	Acts of Aggression	42(5.25)
	Occlusal trauma	24(3)
	Others	13(1.62)

**Table -2**

Place	Percentage of dental trauma
School	30
Home	55
Other	15

**Table -3**

Type of tooth injury	Age				Total(%)
	0-2years n(%)	3-6years n(%)	7-12 years n(%)	13-15years n(%)	
Luxation	50 (30.3)	26 (15.5)	72 (43.6)	17 (10.3)	165 (21.0)
Concussion	70 (12.9)	140 (30.6)	245 (45.1)	55 (11.2)	510 (78.0)
Fracture	4 (7.6)	11 (21.1)	22 (42.3)	15 (28.8)	52 (6.5)
Avulsion	12 (16.4)	18 (24.6)	27 (36.9)	16 (21.9)	73 (9.12)

**Table -4**

Type of tooth injury	Male n (%)	female n (%)	Total (%)
Luxation	120 (73.0)	45 (27.0)	165 (21.0)
Concussion	356 (69.8)	154 (30.1)	510 (78.0)
Fracture	35 (67.0)	17 (33.0)	52 (6.5)
Avulsion	49 (67.0)	24 (33.0)	73 (9.12)

**Table -5**

Etiology	Type of tooth injury			
	Luxation n(%)	Concussion n(%)	Fracture n(%)	Avulsion n(%)
Fall	39 (23.63)	120 (21.9)	18 (34.61)	15 (20.54)
Sports	34 (20.6)	111 (21.77)	13 (25)	17 (23.28)
Collision	30 (18.18)	114(72.35)	5 (9.61)	11(15.06)
RTA	27 (16.36)	64 (12.25)	8 (15.38)	13 (17.80)
Bicycle	22 (13.33)	37 (7.25)	7 (13.46)	16 (21.91)
Acts of aggression	7 (4.24)	34 (6.67)	0	1 (1.36)
Occlusal trauma	4 (2.42)	20 (3.90)	0	0
Others	2 (1.21)	10 (1.96)	1 (1.92)	0
Total	165 (21.0)	510 (78.0)	52 (6.5)	73 (9.12)

**Table -6**

Etiology	Age				Total (%)
	0-2 years n(%)	3-6years n(%)	7-12 years n(%)	13-15 years n(%)	
Fall	63 (32.8)	37 (19.27)	57 (29.68)	35 (18.2)	192 (24.2)
Sports	0	27 (15.42)	85 (48.57)	63 (36)	175 (21.9)
Collision	11 (6.87)	53 (33.1)	51(31.8)	45 (28.1)	160 (20)
RTA	7 (5.73)	39 (31.96)	27(22.13)	49 (40.2)	122 (15.3)
Bicycle	0	22 (30.55)	32 (44.44)	18 (25)	72 (9)
Acts of Aggression	0	0	12 (28.57)	30 (71.4)	42 (5.25)
Occlusal trauma	1 (4.16)	13 (54.16)	9 (37.5)	1 (4.16)	24 (3)
Others	0	7 (53.84)	2 (15.38)	4 (30.8)	13(1.62)

#### **IV. Discussion**

Traumatic dental injuries (TDI) are common among children and adolescents in many societies, causing major health problems and social issues. It results in functional, aesthetic and psychological disturbances, accompanied by great concern from the child, parent and the dentist.<sup>8</sup> Oral injuries are most common during the first ten years of life, decreasing gradually with age.<sup>9,10</sup> Even though oral region covers only a minute percentage (1%) of the total body area, it accounts for 5% of all injuries.<sup>10</sup> The assessment of TDI in primary and mixed dentition is important to understand and manage its sequelae during the development of occlusion. It also helps to identify future developmental alterations in the permanent dentition.<sup>11</sup>

In this study, the selected age ranged from zero to fifteen years, as during this period there is maximum physiological growth and children are actively involved in various physical activities. It was observed that TDI was more among boys. This is in accordance with previous study reports.<sup>12</sup> It may be due to more active participation of boys in physical activities like playing sports and games. Majority of dental trauma took place at home (55%), followed by school (30%) and other places (15%). This is in agreement with reports of Blinkhorn et al,<sup>13</sup> Onetto et al<sup>14</sup> and Guptha et al.<sup>15</sup> This is explainable by the fact that children spend more time at home. A significant percentage of TDI occurs at school also. Campaigns should be done in schools regarding the prevention of TDI and to educate students and teachers about its emergency management.

In this study, the most frequent type of injury was a concussion (78%), followed by luxation (21%). This is in disagreement with studies of Bastone et al<sup>16</sup> and Saroglu et al.<sup>17</sup> This may be due to the fact that usually in a concussion injury, parents may not seek emergency treatment. It may be due to ignorance of this condition or due to lack of health care access or due to lack of obvious findings like bleeding or tooth fractures. Many of these injuries may remain undiscovered in cross sectional studies, in which sampling is done from the general population. But when data are evaluated retrospectively from a health care centre sampling, this type of injury is usually accounted. It was found that falls were the most frequent etiological factor of dental injury (24.2%) and is more in the 0-2 year age group (32.81%). This finding is in agreement with previous study reports.<sup>18,19,20</sup> It may be due to the fact that children acquire independence and start to explore the environment, along with an imbalance in newly walking stage. Caretakers and parents of this age group must be educated to ensure a child safe environment at home and care centres.

Sporting injuries accounted for 21.87% of dental trauma, which is in line with study reports of Shirani G et al<sup>21</sup> and Kumamoto et al.<sup>22</sup> It is more prevalent in the 7-12 year group (48.57%), followed by the 13-15 year group (36%). This emphasizes the need for effective educational programmes targeting sports authorities, organizers and parents, to ensure safety measures like mouth guards and raise awareness about management of emergencies like an avulsion. TDI due to person to person collision was 20%, within this, concussion type of injury was more commonly noticed (72.35%). RTA and bicycle accidents accounted for significant amount of TDI in other studies. Acts of aggression accounted for 5.25% and reports showed that children may be passively involved in incidents of violence. Occlusal trauma accounted for 3% and it included biting on hard objects and it is similar to other reports.<sup>23,24</sup> Other causes of dental trauma include acts of violence, iatrogenic and unclear causes (1.62%) which gives similarity to other studies.<sup>25,26</sup>

#### **V. Conclusion**

Managing a TDI often presents a challenge to care givers. Emergency management should be considered to begin at the time of injury rather than at the time of seeking professional care. The general public of underprivileged societies are unaware about the risks of TDI and do not have sufficient information regarding its prevention or about its emergency management. Many a times, an avulsed permanent tooth is discarded by the child or the parent due to ignorance about the management of avulsion injuries. Some parents were even found to have a misconception that any number of teeth lost during childhood, would regrow. This highlights the need for educating the general public about TDI management, especially in under developed or developing societies. In some cases parents do not reveal a history of abuse and in some cases children themselves are unable to provide a clear history, so health care workers should give due diligence to educate parents about child abuse and its reporting. The incidence and pattern of TDI may vary widely from region to region. It will depend a lot on the living conditions, infrastructure of the society, acts of prolonged violence, adverse political conditions etc. Since this study was done by using secondary data, precision and reliability of records are uncertain, which is a limitation. But it gives evidence of causative factors that can serve reference for policy making, education and for adopting preventive programmes.

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