

Alexithymia in Children with Traumatic Dental Injuries- A Cross-sectional Study

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ABSTRACT

Introduction: Alexithymia is a personality trait that affects the emotional regulation. It has been found associated especially with pain disorders. It is a personality construct which is characterised by inability to experience and describe feelings, making an alexithymia patient suffer from mental clouding. Therefore, it is important to diagnose patients with alexithymia in dental clinics since it may adversely affect the doctor patient relationship and treatment outcome.

Aim: To find the prevalence of alexithymia and to find any difference in alexithymia traits between children with Traumatic Dental Injury (TDI) and those without it.

Materials and Methods: This cross-sectional study was conducted on 10-19 years old adolescents reporting to K.M. Shah Dental College and Hospital, Sumandeep Vidyapeeth (Deemed to be University), Vadodara, Gujarat, India, from February 2018 to September 2018. A total of 420 participants were enrolled with 210 in each group

(with TDI and without TDI). Toronto Alexithymia Scale (TAS-20) was used to identify alexithymia. Andreasen's classification for TDI was used to classify the TDI. Chi-square was used to compare the non parametric data between the groups. Unpaired t-test was performed for the comparison of scores between groups for total TAS-20 score and as well as for the nine dimensions.

Results: The prevalence of alexithymia was found to be 86.1% in children with TDI compared to 30.9% in children without TDI. The difference in prevalence of alexithymia between children with TDI and those without was statistically significant (p -value=0.0001). Children with TDI reported with significantly higher total TAS scores. However, difference with respect to gender was not statistically significant.

Conclusion: The prevalence of alexithymia was found significantly higher in children with TDI. Also, the TAS-20 score and the individual domain scores were higher in children with TDI. Hence, alexithymia may be associated with TDI.

Keywords: Cognitive, Emotion, Toronto alexithymia scale, Trauma

INTRODUCTION

Dental trauma in permanent teeth is a highly prevalent event worldwide, with children and adolescents being the most afflicted. Traumatic Dental Injury (TDI) among this population have been reported to be as high as 58 percent, with anterior permanent teeth being affected the most [1]. Worldwide, it has been revealed that dental trauma is one of the most common emergency situations in dentistry [2].

The injuries attributed to dental trauma not only cause psychological, social, aesthetic and functional problems but can lead to loss of tooth. Traumatic injury has not just the physical bearing, but it may also adversely impact emotionally and psychologically. The resultant negative impact may eventually lead to neurosis or psychosis. Due to its high prevalence, TDI are a serious dental public health concern due to high prevalence in children [3].

Alexithymia refers to difficulties an individual has in identifying and describing one's own emotions or feelings, alongside difficulties in distinguishing feelings from bodily sensations, as well and externally oriented cognitive style of thinking [4]. Close monitoring of emotional development and competence can help better diagnose alexithymia in children. Emotional competence can be defined as how children can respond emotionally, yet simultaneously and strategically apply their knowledge about emotions and their expression to relationships with others, so that they can negotiate interpersonal exchanges and regulate their emotional experiences [5].

The Toronto Alexithymia Scale (TAS-20) is a commonly used tool for measurement of alexythemia. The TAS-20 comprises of three domains: Difficulty Identifying Feelings (DIF), Difficulty Describing Feelings (DDF), Externally-Oriented Thinking (EOT). Rieffe C et al., developed a version of the TAS-20 for use in adolescents or children (the Alexithymia Questionnaire for Children, AQC) [5].

Alexithymia, in literary means no words for feelings. It is a behavioral construct which is characterised by lack of ability to experience and describe feeling, decreased imagination and an externally oriented way of thinking. These characteristics cause an inability to control and express emotions, making the alexithymic person to present with mental clouding. Alexithymia has been reported to have association with medical conditions and psychological disorders. Furthermore, alexithymic patients can present major treatment problems. The identification of alexithymia has significant relevance in dental patients because it can act as determinant of dentist-patient relationship, making the relation worse even more for patients with higher anxiety [6].

The concept has been widely studied among adults, and specially in patients with pain. It is presumed to be a behavioral trait that presents in childhood, it has not much been researched upon in children [7]. Pain has been found be commonly associated with alexithymia. It has also been reported to be positively associated with intensity of pain [8]. Furthermore, dental trauma may lead to pain. Also, school-aged children and adolescents are more involved in recreational and sports activities making them at increased risk for trauma and subsequent pain. Hence, the study was conducted with an aim to check for prevalence of alexithymia and to find any difference with respect to alexithymia between adolescents with TDI and without TDI. It was hypothesised that adolescents with TDI would present with higher alexithymia scores.

MATERIALS AND METHODS

This cross-sectional study was conducted on 10-19 years old adolescents reporting to K.M. Shah Dental College and Hospital, Sumandeep Vidyapeeth (Deemed to be University), Vadodara, Gujarat, India. The data collection was done from February 2018 to September 2018. The study protocol was approved by the Human

Research Review Board of the Institute and Ethical approval was obtained from University Ethics Committee (IEC no SVIEC/ON/DENT/SRP/18008).

Sample size calculation: The sample size estimated was 207 per group. Considering the prevalence of traumatic injury in adolescents to be 16.1%, the power of study as 80% and level of significance at 0.05, the sample size was estimated using the given formula [9,10].

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Inclusion and Exclusion criteria: All 420 adolescents were recruited from Department of Paediatric and Preventive Dentistry of a tertiary care dental hospital in the city. The inclusion criteria for TDI group (case group) was adolescents diagnosed with TDI and consenting to participate. For the Non TDI group (control group), age and gender matched adolescents without TDI were recruited. Adolescent having any systemic disease, illness, acute pain, any psychological disorders, special group children, adolescent with loss of teeth due to reasons other than traumatic injuries and those with history of or undergoing orthodontic treatment were excluded from the study. The adolescents meeting the criteria were recruited till the desired sample size was attained.

Study Procedure

A total of 420 subjects were enrolled in the study, ranging from 10-19-year-old of age. The participants were sampled into two categories consisting of equal number of participants (n=210). The two groups comprised of participants with TDI (TDI group) and those without TDI (Non TDI group). The purpose and procedure of the study was explained to each participant and participation information sheet were provided to them in their local language. A written consent was obtained from the parents of and assent from participating adolescents.

Alexithymia: Toronto Alexithymia Scale (TAS-20) was used to assess alexithymia. TAS-20 comprises of 20 questions grouped into three domains: "Difficulty Identifying Feelings, Difficulty Describing Feelings and Externally-Oriented Thinking". The TAS-20 is a 20 item self-administered scale commonly used for assessment of alexithymia. It is a five point Likert scale where each item is rated from 1 (strongly disagree) to 5 (strongly agree). [6].

Difficulty Identifying Feelings is a measure of reassessing respondents' difficulty in identifying the emotion. It has seven questions that assess the "ability to identify feelings and to distinguish them from the bodily sensations". Difficulty Describing Feelings subscale comprised of five items that assess the "capacity to name and describe feelings to other people". Externally-Oriented Thinking consists of eight items assessing externally-oriented thinking. The TAS-20 scores were categorised according to the suggested cut off: ≥ 61 indicating alexithymia; 51-60 possible alexithymia (borderline range) < 51 indicating no alexithymia [11].

The local version of TAS-20 scale was used. The local language version of questionnaire was validated by a forward and back translation approach, where a bilingual expert translated the questionnaire into the local language from English. The reconciled version was then back-translated by a native English expert, not familiar with the original questionnaire. This back translated version was compared with the original questionnaire by another language expert. A cognitive debriefing process was also followed for the cultural adaptation of the questionnaire.

Diagnosis of TDI: A TDI diagnosis was made at the department from where the child was recruited. "Andreasen's epidemiological classification (2004) including World Health Organisation (WHO) codes" was used to classify the type of TDI [12].

STATISTICAL ANALYSIS

Chi-square was used to compare the descriptive data between groups. The scores for total TAS 20 and subscales score comparison was done using Independent t-test. The level of significance was set at p-value < 0.05 . Statistical analysis was done using IBM Statistical Package for the Social Sciences (SPSS) statistics for Windows, version 26, Armonk, NY: IBM Corp.

RESULTS

A total of 420 adolescents participated in the study. The ratio of males to females in the sample was 115:95. Stratifying the participants by age, 48.57% were in the age range of 10-14 years and 51.42% in 15-19 years. The prevalence of alexithymia was found to be 86.1% in children with TDI compared to 30.9% in controls. This difference was found to be statistically significant ($p=0.0001$). On comparison between the cases and controls (children with and without TDI, respectively), it was found that not only the prevalence was significantly higher in cases, but the total TAS score and scores for subscales DDF and DIF were found to be significantly higher among children with TDI [Table/Fig-1].

Variables	Cases n=210, %	Controls n=210, %	p-value
Frequency of alexithymia (%) [§]	181 (86.1)	65 (30.9)	0.0001*
TAS-20 total score [#]	64.98 \pm 4.33	55.82 \pm 6.39	0.0001*
TAS-20 DIF score [#]	24.39 \pm 2.831	16.9 \pm 3.759	0.0001*
TAS-20 DDF score [#]	16.64 \pm 2.28	13.18 \pm 1.348	0.0001*
TAS-20 EOT score [#]	23.95 \pm 2.57	25.74 \pm 2.42	0.0001*

[Table/Fig-1]: Prevalence of alexithymia, total TAS-20 scores, and factor scores between cases and controls.

Independent t-test[#]; χ^2 test[§]; **p-value < 0.05 statistically significant; SD: Standard deviation; TAS-20: Toronto alexithymia scale; DDF: Difficulty describing feelings; EOT: Externally oriented thinking; DIF: Difficulties identifying feelings

Among the subscales, the sum score and mean score for Externally Oriented Thinking was highest (23.20 and 2.90 \pm 0.755) followed by higher mean score of Difficulty Defining Feelings (2.49 \pm 0.49) and DIF (2.09 \pm 0.31) [Table/Fig-2].

Q. No.	Subscale	Questions	Mean	Mean \pm SD
1	Difficulty identifying feelings	I am often confused about the way I am feeling inside	1.53	(Total score=14.68) Mean= 2.09 \pm 0.31
3		I feel things in my body that even doctors don't understand	2.28	
6		When I am upset, I don't know if I am sad, scared or angry	1.83	
7		I am often puzzled by things I feel inside my body	2.18	
9		Sometimes I cant find words to say how I feel inside	2.32	
13		I don't know whats going on inside me	2.43	
14		I often don't know why I am angry	2.11	
2	Difficulty describing feelings	I find it difficult to say how I feel inside	2.37	Total=12.49 Mean=2.49 \pm 0.49
4		I can easily say how I feel inside	2.65	
11		I find it hard to say how I feel about other people	1.71	
12		Other people tell me that I should talk more about how I feel inside	2.82	
17		It is difficult for me to say how I really feel inside, even to my best friend	2.94	

5	Externally-oriented thinking	When I have a problem, I want to know where it comes from and not just talk about it	2.45	Total= 23.20 Mean=2.90±0.755
8		I would rather wait and see what happens, instead of thinking about why things happen	3.02	
10		It is important to understand how you feel inside	2.02	
15		I prefer talking to people about everyday things, rather than about how they feel	3.39	
16		I prefer watching funny television programmes, rather than films that tell a story about other people's problems	3.11	
18		I can feel close to someone, even when we are sitting still and not saying anything	3.47	
19		Thinking about how I feel, helps me when I want to do something about my problems	1.78	
20		When I have to concentrate on a film to understand the story, I enjoy the film much less	3.97	

[Table/Fig-2]: Alexithymia subscale scores [5].

On analysis of the type of TDI encountered, it was found that greatest percentage was of enamel/dentin fracture (34.28%) followed by enamel fracture (32.4%), pulp injury (20.47%) and missing due to trauma (12.85%). When compared between males and females, prevalence of trauma was significantly higher across most subgroups among males [Table/Fig-3]. However, there was no significant difference between males and females for TAS-20 or any of the three subscales [Table/Fig-4].

Type of trauma	Total (n,%)	Male {n (%)}	Female {n (%)}	p-value
Enamel fracture only	68 (32.4%)	36 (52.94%)	32 (47.05%)	0.031*
Enamel/Dentin fracture	72 (34.28%)	42 (58.33%)	30 (41.66%)	0.025*
Pulp injury	43 (20.47%)	24 (55.81%)	19 (44.19%)	0.036*
Missing due to trauma	27 (12.85%)	13 (48.15%)	14 (51.85%)	0.032*
Total	210 (100%)	115 (54.76%)	95 (45.24%)	

[Table/Fig-3]: Distribution of type of trauma by gender.

*p-value <0.05 statistically significant; χ^2 test

Variables	Males	Females	p-value
TAS-20 total score	60.28±7.75	60.51±7.08	0.746
TAS-20 DIF score	20.67±5.023	20.57±5.014	0.84
TAS-20 DDF score	14.94±2.563	14.86±2.541	0.762
TAS-20 EOT score	24.68±2.589	25.08±2.728	0.123

[Table/Fig-4]: Comparison of the total TAS-20 scores and the sub scale scores by gender (mean±SD).

DIF: Difficulty identifying feelings; DDF: Difficulty describing feelings; EOT: Externally-oriented thinking Independent t-test; p-value <0.05 statistically significant

DISCUSSION

The TDI are very common in childhood and among adolescents [13]. Adolescence is a period of maximum growth hence, children between 10 and 19 years of age were included in the study. Children at this age are actively involved in sports and other physical activities making them at increased risk for experiencing traumatic injuries and subsequently leading to pain [14].

Pain is a sensory and emotional experience. The emotional component varies from person to person and in the same person from time to time whereas, alexithymia is a personality construct characterised by the subclinical inability to identify and describe emotions in the self (according to Baghby RM et al.) [15]. In the present study children with TDI presented with greater alexithymia scores, indicating to a possible association. The finding was in accordance with research hypothesis. The children with TDI showed very significant alexithymic traits in them compared to those without traumatic injuries. Traumatic injuries not only adversely affect physical health but also have bearing on mental health. Trauma can make people anxious even years after physical healing. Children are more susceptible since their brain is still developing. Therefore trauma can have an indirect bearing on child's ability to identify and describe their feelings [16]. That, possibly explains why children with TDI showed significantly higher alexithymic trait.

Alexithymia is a personality trait with poor emotional control characterised by difficulties in identifying and describing emotions. Alexithymic patients are inclined to suppress the emotions according to Lumely MA et al., [17]. Alexithymia has been largely associated with pain and related syndromes. It has been reported that more than half of patients in pain presented with alexithymic traits [18-22].

The Toronto Alexithymia Scale (TAS) is a 20 item self-report assessment scale for Alexithymia. It is a 5-point Likert scale with scores ranging from 20-100. The subject can be classified as non alexithymic and alexithymic based on the total score [6].

Although the validity of self-report questionnaires in children is frequently questioned, it has been argued that internal states, such as emotions or reflections upon these emotions, are best known to children themselves, because it is only they who have direct access to their own emotion experience. Several studies have indeed confirmed that it is most appropriate to ask the child itself, which is especially true for internalising problems [17,23,24]. Though a self reported questionnaire was used to assess alexithymia among children, it may not compromise the validity of the response since, these instruments are better suited for assessment of emotional state.

In the present study, presence of alexithymia in higher proportions in patients with TDI confirms that alexithymia is significantly associated with it. Moreover, this notable association was demonstrated for the first time in this cross-sectional study. Externally oriented thinking showed highest mean followed by DDF and DIF.

The TDI patients presented consistently higher scores than the controls in the DIF subscale, suggesting that children with trauma showed more difficulty in identifying feelings. Not just identifying feelings, the subjects with trauma also presented with difficulty in expressing feelings. Similar behaviour pattern and coping strategy has been mentioned for children with trauma [25].

The high rate of alexithymia in TDI patients means that dental professionals must be equipped to respond to these patients and to prescribe appropriate treatment if necessary. The advantage of diagnosing a patient with alexithymia is that the physician/clinician can better understand the behaviour of patient, making him more sensitive and understanding. It can otherwise be frustrating for the physician to understand the patient's indifference and unacceptance of the treatment as well as the doctor [26]. Diagnosis of alexithymia in dental patients would help in designing the treatment plan addressing the need of patient. It is advisable to sensitise and train the healthcare professionals towards identification and understanding alexithymia. Dental professionals can be educated and trained by the psychiatrist for diagnosis and treatment modalities for alexithymia. The treatment modality for such condition includes group therapy, actively engaging in skill-based creative arts, relaxation techniques, book and emotional content reading. The study establishes an association between

traumatic injuries and alexithymia. However, the causal pathway needs to be understood.

Limitation(s)

The retest of alexithymia after treatment of traumatic injury in case group could not be done. Thus, cause effect relationship couldn't be established. Secondly, it was done on a discrete sample derived from hospital, which can lead to incorporation of selection bias. However, the strength of the study was the exploration of alexithymia in dental patients which has previously not been researched upon. It presented the need for early diagnosis of alexithymia in dental patients.

CONCLUSION(S)

The present study suggested that adolescents with TDI presented with alexithymic traits, showing higher alexithymic score when compared to children without TDI. However, there was no significant difference between males and females for TAS-20 or any of the three subscales. Further research is needed to establish the role of alexithymia as a psychological or behavioural determinant of dental disorders and/or as a possible risk factor for the disease.

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