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OPEN ACCESS JOURNAL ISSN: 2148-6832

MSD Medical Science and Discovery
2019; 6(10):284-7

Research Article Doi: 10.36472/msd.v6i10.318

Evaluation of the relationship between MIH severity and dental fear among the children

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Abstract

Objective: Molar incisor hypomineralization (MIH), a quite common condition in pediatric dentistry, whose treatment might seem complicated, manifests itself with severe dental anxiety and fear that can cause behavioral problems. Although dental fear is seen in almost all cases, it is believed that dental fear will increase as the severity of MIH increases. This study evaluates the relationship between MIH severity and dental fear.

Material and Methods: Children Fear Survey Schedule-Dental Subscale (CFSS-DS) was used to measure dental fear in 58 (51.79%) children whose teeth suffered from mild, moderate or severe MIH and 54 (48.21%) children with healthy teeth. Scores between 1 (not afraid at all) and 5 (very afraid) were given according to the responses. Each question was evaluated separately in order to obtain the total score.

Results: Children with severe MIH who participated in the study were proved to be more afraid of the dentists, drill sounds, injections, placement of instruments in the mouth, choking and going to the hospital; and there was a statistically significant difference ($p<0.05$).

Conclusion: Although it was observed that the severity of MIH and dental fear are correlated and dental fear increases with the increase in the MIH severity, further studies in this subject are necessary.

Keywords: Anxiety, CFSS-DS, Dental Fear, Molar Incisor Hypomineralization, Pediatric Dentistry.

Introduction

Molar incisor hypomineralization is defined as a morphologic enamel defect as a result of mineral deficiency due to systemic causes, that can be seen in one third or more of the occlusal surface of the molars and incisal surface of the incisors.(1) Clinically, they are demarcated qualitative defects that vary from white opaque to yellow-brown lesions. In many cases, dental problems such as severe tooth sensitivity and even loss of teeth due to demarcated hypomineralized enamel can be seen in first permanent molar teeth (2,3). The probability of dental problems varies in direct proportion to the severity of MIH. Nowadays, molar incisor hypomineralization is categorized into three groups as mild, moderate and severe (4). In the most common mild type, enamel surface loss is not observed, but opacity occurs. Enamel with a defect is of normal thickness but its color changes from white to yellow-brown. The incisors are usually slightly affected. There are demarcated opacities in the non-stress bearing areas of the molar teeth. Loss of enamel due to fracture in the opaque areas and cavity in the affected enamel are not observed. There is no sensitivity in the tooth, but the number of atypical restorations increases as the child grows older (5).

In moderate hypomineralization, demarcated opacities occur in the incisal/occlusal surfaces of the teeth. Fractures after the eruption of the tooth or cavities are limited to 1 or 2 surfaces of the tooth, tubercles not included. It is stated that the sensitivity of the tooth is generally within normal limits. The patient or the families often have aesthetic concerns (5).

In the severe type, post-eruptive enamel loss, atypical cavities, atypical restorations and necessary tooth extraction occur. Approximately half of the children with affected permanent molars have also clinical symptoms in their incisors, 1/3 of them have severe hypomineralization (6). In children with severe type molar incisor hypomineralization, defects turn into dynamic lesions with age. The number of restorations and the number of extracted teeth are increased due to dynamic lesions (7).

Received 06-10-2019 **Accepted** 28-10-2019 **Available Online** 28-10-2019 **Published** 30-10-2019
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http://dx.doi.org/10.36472/msd.v6i10.318

The defects of the incisors also affect the psychological and social development of the children. Therefore, the treatments should not only be clinical but also meet the psychologic and social needs (8).

The treatment is complex due to dental fear and behavioral disorder problems in children with molar incisor hypomineralization. A study, which evaluated the results of a fear-measuring scala on children who had hypomineralized molar teeth and children in the follow-up group who had healthy enamel, showed that children with hypomineralized teeth are considerably afraid of going to the hospital and choking (2). However, there aren't any previous researches that evaluate the relationship between the severity of MIH and fear. The purpose of this study is to examine the relationship between the severity of MIH and fear in children.

Material and Methods

The study was initiated after the necessary permissions were given by the Medical Research Ethics Committee of Istanbul Medipol University (Approval no:546). A literature review was made and it was decided to use Children Fear Survey Schedule - Dental Subscale (CFSS-DS), a validated psychometric method which had been developed by Cuthbert and Melamed in 1982 and had previously been used in several studies.(9,10)

The study was conducted at Istanbul Medipol University Faculty of Dentistry Pediatric Dentistry Clinic between the dates 06.07.2019 - 10.08.2019. Among the children whose teeth were brushed with a disposable toothbrush, 112 children in total were included in the study: 58(51.79%) (26 male, 32 female),children between the age of 8-12 who weren't mentally retarded, who had at least one permanent molar tooth affected by MIH and 54(48.21%) (27 male, 27 female) randomly selected children who didn't have any affected teeth. The severity of MIH was determined during dental examination. CFSS-DS, consisted of 15 questions, was conducted after getting written consent from the children and their parents. The participants were asked to answer all of the survey questions. The questions of the survey are shown in Table 1.

The results were examined and the relationship between the age, gender, MIH severity (mild/moderate/severe) and dental fear level was evaluated. The CFSS-DS consists of 15 items relating to different aspects of dental treatment possible scores range from 1 (not afraid at all) to 5 (very afraid). According to the scoring system, every answer had a value between 1-5 and the total score ranged between the 15-75.Every answer was evaluated separately and the total score between 15-25 showed no dental fear, 26-32 showed mild dental fear, 33-38 showed moderate dental fear but the fear can be kept under control or the fear is borderline; the total score of 39 and above showed severe dental fear.

The data were analyzed using computerized Statistical Package for Social Sciences (SPSS) 21 for windows (SPSS Inc. Chicago, IL, USA). ANOVA test was used to compare the means of multiple variables. An Independent-Samples T-test was used to compare the means of two variable, while Chi-Square test was used when proportions were compared. The level of statistical significance was chosen at $p< 0.05$.

Results

The average score of the answers to the CFSS-DS, which consisted of 15 questions, showed that all children were afraid of dental drills and injections. Children with MIH, who were similarly more afraid of the dental drills and injections, were also afraid of the dentists, dental examinations, opening their mouth, someone touching them harshly or someone looking at them, placement of any instruments in the mouth, choking and going to the hospital and there was a statistically significant difference ($p<0.05$). The data concerning the questions and the answers are shown in Table 1.

Where the relationship between MIH severity and the answers to the CFSS-DS questions was concerned, there wasn't a statistically significant difference between the mild and moderate MIH follow-up group but the average score was higher. As for the relationship between the severe MIH and the other groups, it was proven that the children were more afraid of dental drills, injections, drill sounds, placement of instruments in the mouth, choking and going to the hospital; and there was a statistically significant difference ($p<0.05$). The data concerning the relationship between the CFSS-DS questions and the severity of MIH are shown in Table 1.

The total CFSS-DS score, obtained by adding all the scores of the answers, showed that rate of the children whose score was between 15-25 (no dental fear) was 48.21%; between 26-32 (mild dental fear) was 27.67%, between 33-38 (moderate fearbut the fear can be kept under control) was 14.28% and 39 and above (severe dental fear) was 9.82%. The distribution of the CFSS-DS total score by the number of children is shown in Table 2.

The total CFSS-DS score average showed that the control group (23.47) had the lowest score and it was respectively increasing in the mild (24.74) and moderate (26.34) groups while the severe group (41.52) highest score; and there was a statistically significant difference ($p<0.05$). The distribution of the total score by the groups and the maximum and minimum values obtained in every group are shown in Table 3.

Table 1. Mean scores of the CFSS-DS.

Item	Control Mean±SD	Mild Mean±SD	Moderate Mean±SD	Severe Mean±SD
1.Dentists	1.49±0.77	1.54±0.74	1.98±0.96	** 3.21±1.12
2.Doctors	1.36±0.68	1.40±0.82	1.48±1.10	* 2.34±0.88
3.Injections	2.30±1.42	2.49±1.18	2.56±1.24	** 4.48±0.37
4.Having somebody examine your mouth	1.35±0.74	1.39±0.78	1.39±0.78	**2.21±0.82
5.Having to open your mouth	1.01±0.59	1.15±0.65	1.19±0.76	** 2.06±0.92
6.Having a stranger touch you	1.27±0.69	1.31±0.69	1.42±0.77	**2.49±0.99
7.Having somebody look at you	1.14±0.62	1.12±0.58	1.48±1.12	**2.40±1.02
8.The dentist drilling	2.44±1.24	2.65±1.24	2.72±1.54	**4.02±0.63
9.The sight of the dentist drilling	1.76±0.95	1.86±1.12	2.01±1.25	*2.95±1.32
10.The noise of the dentist drilling	1.84±0.92	1.92±1.03	2.00±1.22	*3.46±1.35
11.Having somebody put instruments	1.78±0.86	1.95±1.32	2.21±1.36	*3.38±1.44
12.Choking	1.77±0.91	1.82±0.99	1.72±0.95	*3.10±1.02
13.Having to go to the hospital	1.61±0.76	1.80±0.85	1.86±0.92	*3.04±1.17
14.People in while uniform	1.16±0.61	1.11±0.66	1.14±0.54	1.17±0.87
15.Having the nurse clean your teeth	1.19±0.57	1.23±0.64	1.18±0.66	1.21±0.60
Total	**23.47±12.33**	**24.74 13.29**	**26.34±15.17**	**41.52±14.52**

*p<0.05; **p<0.01.

Table 2. CFSS-DS Total score and number of children relation

CFSS-DS Total Score	Number of Children (%)
15-25	54 (48.21%)
26-32	31 (27.67%)
33-38	16 (14.28%)
>38	11 (9.82%)

Table 3. MIH severity and total CFSS-DS score relation

MIH Severity	Person n (%)	Maximum score	Minimum score	Average score
Control group	54 (48.21%)	31	15	23.47
Mild	26 (23.21%)	30	15	24.74
Moderate	19 (16.96%)	36	16	26.34
Severe	13 (11.60%)	62	19	*41.52

*statistically difference

Discussion

Dental fear; is a normal emotional reaction that occurs during dental procedures against fear stimulants. Dental anxiety on the other hand, is the concern that something terrible will happen during the dental treatment and the feeling of losing control (11).

Studies conducted on different populations reported that the frequency rate of dental fear in children is 5-28% (12). However, the probability of encountering dental fear during dental treatments in children varies between 3% and 43% depending on the populations studied (9,13-16).

Dental fear and anxiety are stated to be affected by age, gender, socioeconomic and demographic factors (17). Although there are few studies directly investigating the relationship between dental fear and anxiety and sociodemographic status, it has been reported that the relationship between dental anxiety and social class is strong (18,19). Similarly, low socioeconomic status is a part of the MIH etiology as it is one of the reasons of MIH (4). Dental fear is a common condition in children with MIH, but studies conducted on children with affected teeth showed that due to dental fear and anxiety, children often open their mouth unwillingly and over-reach to air spray during their dental examination and when an instrument is placed in their mouth in the course of dental treatment.(6) Therefore, some researchers recommend that treatments should be performed under sedation or general anesthesia.(4,6,7) The aim of this study was to evaluate the relationship between the severity of hypomineralization and dental fear which is often seen in children who were affected by MIH. Many scales have been developed to examine the subjective concept of fear in the clinic. CFSS-DS, a scale with high-validity that had previously been used in many studies (14-16) and proved to be the best scale to measure dental fear, was preferred. The total score ranged from 15 to 75. It was stated that the score between 15-25 showed no dental fear, 26-32 showed mild dental fear that can be kept under control, 33-28 showed moderate dental fear and anxiety, 38 and above showed severe dental fear and anxiety. However, there are authors who suggest that the Borderline score is between 32-38, indicating that children in that range are at risk of having dental fear and need to be studied meticulously.(9,16) The study that was conducted showed that, the total score average was 41.52 in children with severe MIH. In addition, while the total score

was found to be the lowest in the control group (23.47), the average score gradually increased and the total score of severe MIH (41.52) was the highest. When the data was examined, it was concluded that dental fear increases with the severity of MIH. In a study (10) examining dental fear, the rate of the children with a score of 39 and above was 6%, while it was 9.82% in this study. This suggests that dental fear may be higher in children with MIH. When the answers given to the questions were examined, it was seen that children are afraid of injections, opening their mouth and the instruments used by dentists the most. Similar results (9, 20) were found in similar studies. However, the average values obtained in the severe MIH group were higher than those obtained in previous studies. These results confirm that dental fear and anxiety may be higher in children with MIH, and dental fear and anxiety will increase with the increasing severity of MIH.

Conclusion

The study showed that there is indeed a relationship between the severity of MIH and dental fear, and dental fear increases with the increasing MIH. However, some children do not have dental fear even though they have severe MIH. Since there are many factors in the etiology of MIH, it is necessary to determine the factor or factors causing dental fear and further studies are necessary.

Acknowledgement: The author wish to thank who helped data collection at persons in Pediatric Dental Clinic, Istanbul Medipol University Faculty of Dentistry, Istanbul, Turkey.

Conflict of Interest: The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Author's Contributions: CO; Research concept and design, research the literature, Collection of the Data, Statistical analyzes. **CO;** Revision of the article.

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