



The Impact of Molar Incisor Hypo Mineralization on the Quality of Life of Egyptian Children: A Multicenter Study

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ABSTRACT: There are differing opinions on the need for space maintenance after the early removal of first primary molars (D). This review seeks to evaluate the extent of space changes 6 to 12 months after the extraction of primary molars.

Methods: A wide array of electronic databases, such as PUBMED, EMBASE, and the Cochrane libraries, were searched for articles. Relevant studies were identified based on predefined inclusion and exclusion criteria. The primary outcome measure was the extent of change in extraction space.

Results: Only one study was eligible for inclusion. This study on 27 children showed.

Conclusion: The evidence available in this study indicates that extracting (Ds) before the eruption of first permanent molars leads to a more significant space loss compared to extractions performed after the permanent molars have erupted. However, this conclusion should be interpreted with caution due to the methodological limitations of the included studies.

KEYWORDS: Hypomineralization of molars and incisors · Children · Quality of life

I. INTRODUCTION

Molar Incisor Hypomineralization (MIH), is structural defect in the enamel of teeth that has a systemic origin affecting at least one of the first permanent molars. It may also affect the permanent incisors.[1] In 2004 the European Academy of Pediatric Dentistry (EAPD) defined specific criteria for MIH diagnosis[2] which are used to classify MIH as mild or severe. A tooth with colour changes only is considered as (Mild), while severe MIH is diagnosed by loss of enamel, atypical restoration, caries or tooth loss.[3]

Severely affected teeth are usually hypersensitive, this causes difficulty in eating and urges the child to avoid molars and incisors while brushing leading to plaque accumulation, food

stagnation and bad breath, thus affecting quality of life of children.[4] Oral health-related quality of life (OHRQOL) as a concept has emerged quickly in the recent years to assess the oral health, since clinical indicators were not sufficient to measure the psychological impact of oral health condition on affected patients.[5] The OHRQOL concept reflects individual's subjective evaluation regarding their comfort when they are eating or sleeping or engaged in social interaction; self-esteem and satisfaction in relation to their oral health.[6, 7]

Despite the high prevalence of MIH conditions worldwide, the relationship between MIH and OHRQOL has been still scarce.[4, 8-10] To date, no study focused on the OHRQOL of Egyptian children suffering from severe MIH using an Arabic valid and reliable OHRQOL instrument.

Therefore, this study aimed to assess the OHRQOL of 8-14-year-old children suffering from severe MIH before dental treatment using the CPQ 8-10 and CPQ 11-14, hypothesizing that MIH does not affect the OHRQOL of MIH affected children.

II. MATERIALS AND METHODS

The study followed the STROBE checklist for reporting cross-sectional studies. The study was conducted at the Pediatric Dentistry clinic at Ain Shams University (ASU) and the British University in Egypt (BUE), between October 2024 and December 2024 after taking the approval of the ethical committee of Faculty of Dentistry, Ain Shams University, Cairo, Egypt. A written informed consent was signed by the parents after clearly explaining the aim and methodology of this study. The participants age was 8–14 years who applied to dental clinic for any reason.

The inclusion criteria were children diagnosed with severe MIH. Exclusion criteria was the presence of any other type of enamel defects (e.g., dental fluorosis, enamel tooth malformation



linked to syndromes, enamel hypoplasia, amelogenesis imperfecta) and children undergoing fixed appliances orthodontic therapy at the time of dental examination.

Two age specific child perceptions questionnaires, namely the CPQ8–10 and CPQ11–14, were used representing part of the Children Oral Health aspect of Quality of Life Questionnaire (COHQOL) using the validated self-reported Arabic version in parallel in both universities.[7] The CPQs focused on children's perspectives during the period of the past three months and were divided into four sections of oral symptoms, functional limitations, emotional well-being and social well-being.

The items were answered on a rating scale: 0 : accounts for never ,1: accounts for once or two times", 2: accounts for sometimes, 3: accounts for often , and 4: accounts for every day or almost every day. If the patient answered by : Don't Know this would take score 0. The total score ranged from 0 to 100. The higher the score, the higher the impact of oral health on quality of life (QoL) of the children.

Data were collected from both universities, entered in google forms survey and extracted for statistical analysis.

Statistical analysis:Data processing and statistical analysis were performed using the Statistical Package for Social Sciences version 20.0 for Windows (SPSS Inc., Chicago, IL, USA) using Mann-Whitney test. The results were set at 95% confidence interval in which p-value less than 0.5 is non-significant, less than 0.05 is statistically significant, less than 0.005 is highly significant.

III. RESULTS :

The results of the study included 102 children with molar incisor hypomineralization with an average mean age of 10.31 ± 2.30 and a percentage of 54.9% females and 45.1% males. The children were divided according to their age into two groups based on the CPQ questionnaire into group I (n=52) for those children aged 6- 10 years (CPQ8-10) and group II (n=50), who were between 10-15 years (CPQ11-14). The common domains and subdomains of both CPQ questionnaires were used for comparison between the two groups. Comparison between the two groups (Group I and group II) in each domain and its subdomains are shown in table 1 for oral symptoms domain, table 2 for functional limitations domain, table 3 for emotional wellbeing domain and table 4 for social wellbeing domain. The total mean and standard deviation of each and all domains and their

comparison in both groups are shown in table 1, figure 1. Comparison between the total mean and standard deviation of each and all domains in males and females are shown in table 2, figure 2

IV. DISCUSSION

The In our study, the primary objective is to assess the impact of MIH on OHRQoL in two different age groups and in boys versus girls. The overall mean CPQ 8-10 score of all domains was 41.12 ± 10.36 . The scores of each domain of the CPQ-G8-10 showed the following mean and standard deviation scores with oral symptoms 10.94 ± 3.89 , functional limitations 11.04 ± 3.45 , emotional well-being 8.87 ± 5.34 , and social well-being 10.27 ± 4.89 . These results were similar to that of Velandia et al.[11] who assessed OHRQoL using the same method in 88 Columbian children aged 7–10 years and. Two other studies in Mexico and Iran were in line with our results.[10,12]

Children who were older than ten years in group II (n=50) represented 49% of the population study and answered the CPQ11-14 questionnaire. The overall mean score of all domains together in this group was 43.54 ± 16.7 . The average mean with standard deviation in each domain was 14.20 ± 4.69 in oral symptoms domain, 13.70 ± 3.98 in functional limitations domain, 11.76 ± 6.47 in emotional wellbeing domain and 13.16 ± 6.2 in the social wellbeing domain. Although a negative impact of MIH was seen in all four domains, we were able to show that the highest scores were in the oral symptoms and functional limitations domains. This is also in accordance with other studies[8, 11, 12] which also showed the highest impacts in these domains . on the contrary , other studies showed MIH had no impact on the OHRQoL of schoolchildren aged 11–14 years.[13, 14] This difference in results could be explained by variability in sample selection and using different questionnaires. This reduces the comparability of their results with our study.

The results of group 2 were higher than those of group I with a highly statistically significant difference between them. This difference could make sense because untreated MIH deteriorates by time due to poor plaque control , hypersensitivity, breakdown of enamel and finally dental caries.[15] Dantas-Neta et al. reported that severity of MIH increased when the Child Perceptions Questionnaire (CPQ 11-14) was applied to their population with higher scores in the oral symptoms and functional limitation domains.[16] Vargas-Ferreira and Ardenghi also noted that functional limitation in CPQ 11-14 is positively associated with increased severity in enamel



defects.[17] Other authors found more severe MIH in older children when compared to younger ones because of post eruptive enamel breakdown.[11]

The emotional and social well-being sections were found to be higher in older children (group 2) . This can be attributed to the resulting occlusal problems which negatively affect self-esteem in adolescents.[18, 19] Other explanations of this finding could be difficulty in mastication and speech difficulties caused by malocclusion.[16, 18, 19]

Regarding sex, MIH-affected females showed more worse OHRQoL. We found that total score was 54.59±13.57 for females compared to 37.43±10.54 in males which was statistically highly significant. This has also been reported by other authors and concluded that girls are more concerned about their aesthetics and social appearance.[11, 16, 20]

Domain	CPQ 8-10	CPQ 11-14	P-value
Oral symptoms	10.91±3.89	14.20±4.69	0.000
Functional limitations	11.04±3.45	13.70±3.98	0.001
Emotional wellbeing	8.87±5.34	11.76±6.47	0.028
Social wellbeing	10.27±4.89	13.16±6.20	0.020
Total of all domains	41.12±10.36	43.54±16.7	0.000

Table 1: Comparison between the total mean and standard deviation in all domains in group I (CPQ 8-10) and Group II (CPQ 11-14).

Domain	Females (n=56)	Males (n=46)	P-value
Oral symptoms	14.38±4.27	10.30±3.95	0.000
Functional limitations	13.68±3.81	10.76±3.52	0.000
Emotional wellbeing	12.66±5.39	7.39±5.60	0.000
Social wellbeing	13.91±5.90	8.98±4.17	0.000
Total of all domains	54.59±13.57	37.43±10.54	0.000

Table 2: Comparison between males and females in the total mean and standard deviation in all domains.

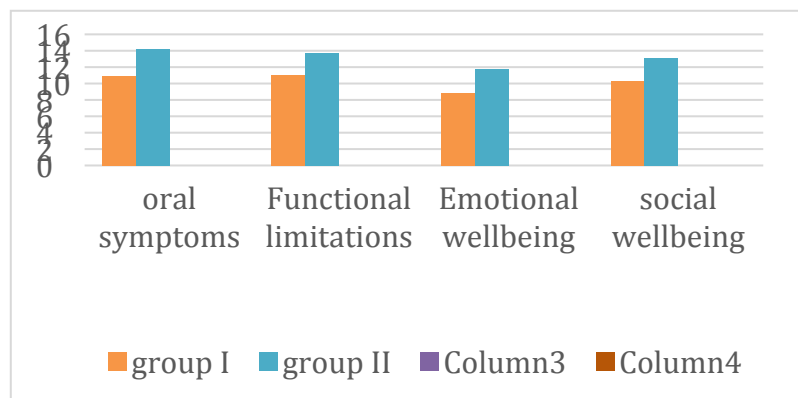


Figure 1: Total mean of eachdomain in group I (CPQ8-10) and group II (CPQ11-14).

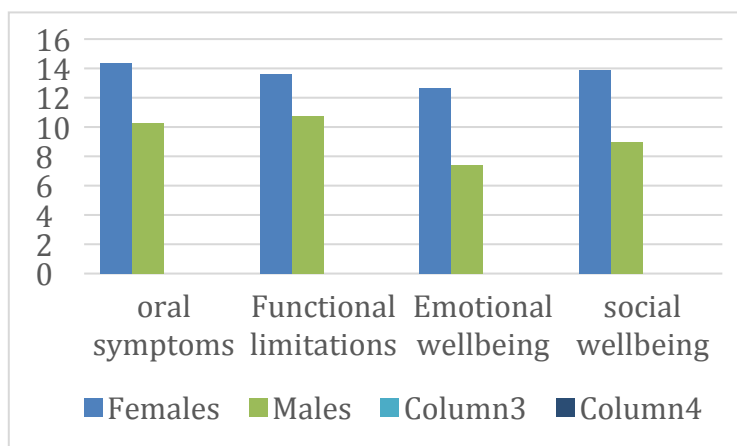


Figure 2: Total mean in each domain in males and females.

V.

VI. CONCLUSION

Our study showed that the presence of MIH has negative impact on all dimensions of OHRQoL in Egyptian children as reflected by the Child perception questionnaire for both age groups with more negative impact as they grow older. Moreover, females had higher oral symptoms and were more affected functionally, emotionally and socially than males due to this condition

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