

Prevalence and Clinical Presentation of Molar Incisor Hypomineralisation Among School Children in Chennai, India

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Abstract

Background: Molar incisor hypomineralization is the term for hypomineralization of one to four first permanent molars with or without concurrent involvement of the permanent incisors (MIH). **Aim:** This study's objective is to evaluate the incidence of MIH and its clinical manifestation among schoolchildren in Chennai, India. **Materials and Methods:** The sample size for this study included 54 participants, ranging in age from 7 to 17. The diagnostic standards suggested by EAPD were applied. According to how serious the flaws were, MIH was divided into three categories: mild, moderate, and severe. **Results and Discussion:** Therefore the results showed that MIH had moderate prevalence (46.1%) among the subjects. With p values of 0.01 and 0.05, respectively, the connection of sex with tooth and prevalence was significant. Females (51.85%) were more to MIH than males (48.15%) among the 11-17 years age group. **Conclusion:** Therefore, it can be concluded that the severe clinical presentation of MIH highlights the need to gain knowledge on prevalence and clinical occurrence in school children.

Keywords: Molar incisor hypomineralisation, Children, Prevalence, EAPD index

1. Introduction

Molar Incisor Hypomineralization is the term used to describe the hypomineralization of one to four permanent first molars that are connected to the impacted incisors (MIH). Because MIH molars are weak, caries spreads quickly in these teeth. Although there are various researches on MIH molars and their occurrence, there is only limited data on the size of this problem (Weerheijm 2003). MIH has been reported among children to be in the form of isolated hypomineralized defects in enamel occurring in the first permanent molars (FPMs) and incisors as opacities in enamel surface (Martinovic et al. 2017). This was first noticed by dentists of Sweden in the 1970s (Parikh, Ganesh, and Bhaskar 2012). Since then, the phrase "Molar-Incisor Hypomineralization (MIH)" has gained widespread use to refer to distinct enamel flaws that are coloured yellow or brown. They are found to be asymmetrical in nature and vulnerable to disintegration when subjected to masticatory forces. (Soviero et al. 2009). There are many genetic and environmental factors that might affect tooth growth before, during, and after birth. Because enamel is a special kind of hard

tissue that does not go through remodelling, its structure is irreversibly altered throughout creation. (Bayram, Ozer, and Arici 2009). One of the first permanent teeth to erupt in the oral cavity is the permanent first molar (PFM), which serves as a regulating tooth for the eruption of other teeth. (Drummond and Kilpatrick 2014). Premature loss of incisors and molars will mostly have negative effects on the dental arch's occlusion and function. (McDonald and Sheiham 1992). Due to their early eruption, heavy mastication load, and deep pits and fissures, the molars are regarded as the permanent teeth with the greatest risk of developing caries. (Niazi et al. 2020).

According to the EAPD categorization, mild, moderate, and severe molar incisor hypomineralization have been observed. Mild dental fluorosis and white spot lesions from dental caries are the primary differential diagnosis for MIH. MIH presents as white hypomineralized defects with subsurface porosities in the clinical setting. (Jalevik, Dietz, and Noren 2005). To determine the prevalence and clinical manifestation of MIH among schoolchildren in Chennai, India, is the purpose of this study.

2. Materials and Methods

Study design

This is a case-control study with a sample size of 54 subjects between the age group 7-17 years. The children were selected by a simple randomisation method.

Inclusion and exclusion criteria

The study included kids aged 7 to 17 who had their first four permanent molars fully erupted at the time of enrollment. Children who had fixed orthodontic treatment, enamel hypoplasia, or enamel amelogenesis imperfecta were eliminated. The theoretical first stage of intra-examiner calibration, which provided the clinical criteria for diagnosing MIH and caries, and the clinical practise second stage were separated into two parts.

Data collection

Data were first gathered through a questionnaire that was mailed to parents as a letter. In this study, data on age, gender, parental education, family income, family composition, and a child's prenatal, perinatal, and postnatal history were gathered. The prenatal period variables that were examined included gestational diabetes, abruption, hypertension, and infection during pregnancy. The time of birth (before or after the expected date of delivery), hypoxia, and C-section birth were the perinatal period's variables. Diarrhea/dehydration, chickenpox, pneumonia, fever, malnutrition, etc. were all common postpartum ailments. According on

the degree of the problems and the requirement for therapy, MIH was divided as low, moderate, and severe using the diagnostic criteria proposed by EAPD.

Statistical analysis

For statistical analysis, SPSS version 20.0 statistical software was employed. The information was supposed to indicate if MIH was present or not. MIH severity was divided into three categories: mild, moderate, and severe.

3. Results

From Figure 1, it can be seen that 59.26% of the subjects belong to the 11-17 years of age group and 40.74% were among 7-10 years of age group. From Figure 2, it can be seen that 51.85% of the subjects belong to females and 48.15 % were males. Table 1 and 2 shows the bivariate correlation of age with tooth and prevalence having p values 0.905 and 0.692 respectively, which is more than 0.05, and hence non significant. Table 3 and 4 shows the bivariate correlation of sex with tooth and prevalence having p values 0.010 and 0.030 respectively, which is less than 0.05, and hence has a significant correlation. Therefore, from this study it can be seen that MIH has a moderate (46.1%) prevalence among the subjects and females (51.85%) are more to MIH than males (48.15%) among the 11-17 years of age group. The correlation of sex with tooth and prevalence is seen significant at $p < 0.01$ and $p < 0.05$ level.

Table 1: Bivariate correlations of MIH between age and tooth with the corresponding mean, Standard deviation and Std. error mean values.

Group Statistics					
	AGE	N	Mean	Std. Deviation	Std. Error Mean
TOOTH		30	10.45	32.16	70.88
		30	11.09	33.66	58.22
Correlations					
		AGE		TOOTH	
AGE	Pearson Correlation	1		.017	
	Sig. (2-tailed)			.905	
	N	54		54	
TOOTH	Pearson Correlation	.017		1	
	Sig. (2-tailed)	.905			
	N	54		54	

Table 2: Bivariate correlations of MIH between age and prevalence with the corresponding mean, Standard deviation and Std. error mean values.

Group Statistics					
	AGE	N	Mean	Std. Deviation	Std. Error Mean
PREVALENCE	7-10 YEARS	22	25.13	64.36	13.06
	11-17 YEARS	32	18.12	55.09	98.80
Correlations					
		AGE		PREVALENCE	
AGE	Pearson Correlation	1		-.055	
	Sig. (2-tailed)			.692	
	N	54		54	
PREVALENCE	Pearson Correlation	-.055		1	
	Sig. (2-tailed)	.692			
	N	54		54	

Table 3: Bivariate correlations of MIH between sex and tooth with the corresponding mean, Standard deviation and Std. error mean values.

Group Statistics					
	SEX	N	Mean	Std. Deviation	Std. Error Mean
TOOTH	FEMALE	28	27.50	44.00	83.34
	MALES	26	22.50	44.37	87.75
Correlations					
SEX			SEX		TOOTH
	Pearson Correlation		1		.349**
	Sig. (2-tailed)				.010
	N		54		54
TOOTH			SEX		TOOTH
	Pearson Correlation		.349**		1
	Sig. (2-tailed)		.010		
	N		54		54

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4: Bivariate correlations of MIH between sex and prevalence with the corresponding mean, Standard deviation and Std. error mean values.

Group Statistics					
	SEX	N	Mean	Std. Deviation	Std. Error Mean
PREVALENCE	FEMALE	28	48.21	20.58	39.04
	MALES	26	39.50	79.00	15.70
Correlations					
SEX			SEX		PREVALENCE
	Pearson Correlation		1		.295*
	Sig. (2-tailed)				.030
	N		54		54
PREVALENCE			SEX		PREVALENCE
	Pearson Correlation		.295*		1
	Sig. (2-tailed)		.030		
	N		54		54

*. Correlation is significant at the 0.05 level (2-tailed).

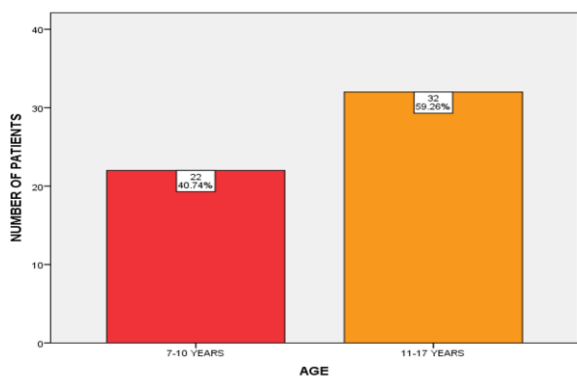


Figure 1: Bar chart represents the study subjects based on Age, where X-axis represents age groups of the subjects and Y-axis represents the number of patients in percentage.

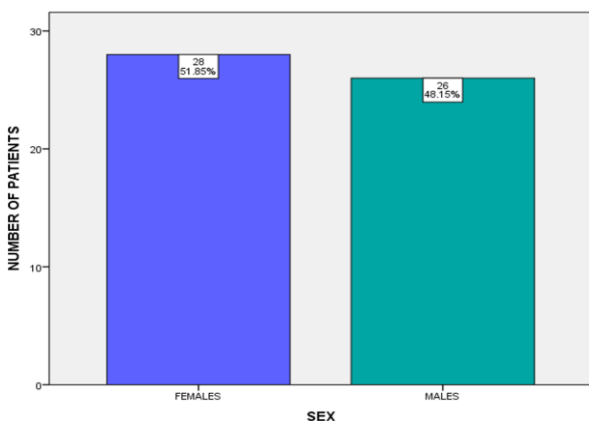


Figure 2: Bar chart represents the study subjects based on Sex, where X-axis represents sex of the subjects and Y-axis represents the number of patients in percentage.

4. Discussion

To avoid severe sequelae from MIH, including as widespread enamel breakdown, early identification is crucial. Since MIH lesions are dynamic, their consequences can be lowered with early detection and preventive measures. The importance of early diagnosis highlights the need for prevalence data, which are lacking in Asian countries like India. The milky white opacity lesion was the most often seen lesion. This lesion received the lowest severity rating. This finding from our investigation is consistent with both studies conducted in India. (N. P. Mittal et al. 2014). Early detection of this issue is crucial to preventing severe consequences brought on by MIH in youngsters, such as widespread enamel breakdown. This may be due to the earlier tooth eruption in females. Post enamel degradation might result from the early eruption of first permanent molars and hypomineralization (PEB) (Chawla, Messer, and Silva 2008). The elder age group (>10 years of age) had MIH problems that were more severe than the younger age group (10 years of age). Only a few studies have reported the importance of early diagnosis in India (Emmatty et al. 2020). There have been numerous reports of MIH prevalence across the world, ranging from 2.8% to 40.2% (Cho, Ki, and Chu 2008). (The causes may be related to variations in the sample size, diagnostic standards, and age group considered. (Jälevik 2010). The prevalence of MIH in

Chennai was determined to be 46.1% in the current study. When compared to the prevalence of MIH recorded in other parts of India (9.46% in Udaipur, 14.9% in Jammu, and 8.9% in Davangere), this was noticeably higher. (N. Mittal and Sharma 2015). The small sample size and different age cohorts were the primary limitations of the current investigation. Despite using a stratified random strategy to choose the sample, there were different numbers of subjects.

5. Conclusion

According to the study, MIH occurs at a prevalence rate of 18% with moderate type (46.1%) being the most common among the 11-17 years of age group. The severe clinical presentation of MIH highlights the need for professionals to gain knowledge on the prevalence and severity of this condition among school children and their parents.

6. Acknowledgement

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7. Conflicts of Interest

There are no conflicts of interest.

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