



Assessing the Prevalence of Molar-Incisor Hypomineralisation among School Children in a North Indian District

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INTRODUCTION: Molar Incisor Hypomineralisation (MIH) is a dental condition which affects the first permanent molars ranging from white opacities to complete breakdown on the teeth and is considered as a matter of global concern.
AIM: To assess the prevalence of MIH in school children aged 8-12 years in District Bulandshahr, Uttar Pradesh, India
MATERIALS AND METHOD: This cross-sectional study was conducted by examining 793 school children aged 8-12 years in various schools. Dental examinations were conducted by four standardized examiners and four recording assistants who entered data in a pre-tested and pre-validated proforma. MIH was clinically identified by the ten-point scoring criteria given by European Academy of Pediatric Dentistry (EAPD) 2011. Data was analyzed using SPSS version 24.0 and the student's t-test and multivariate logistic regression.
RESULTS: Out of 793 children, 186 were diagnosed with MIH (23.5%) with its prevalence reported to be more in boys (102, 54.8%) in comparison to girls (84, 45.2%). The most commonly affected tooth was the mandibular left first permanent molar (22.4%). There was a statistically significant difference reported between gender ($p=0.03$) and maxillary and mandibular molars ($p=0.02$), whereas there was no significant difference among MIH involvement on the site (right and left).
CONCLUSION: As per the data suggested by the present study, it is important that students be screened regularly for the same so that they can be provided early and prompt treatment.
KEYWORDS: Molar Incisor Hypomineralisation, Molars, Screening, Diagnosis

INTRODUCTION

Molar incisor hypomineralization (MIH) is the hypomineralization of the teeth, which is of systemic origin of one to four permanent first molars and are frequently associated with affected incisors.¹ This dental defect is clinically seen as a white to yellow to brown demarcated enamel opacities of different colors, which occasionally undergo posteruptive breakdown due to the presence of soft and porous enamel on the surface.²

The prevalence of MIH ranges from 2.8% to 44% as per the results of various authors.³ In the literature, MIH prevalence varies by country, region, and age group studied.⁴ Examination of teeth for such a defects should be done in children aged 8 years as all first molars and most incisors would have erupted in the oral cavity. The term molar-incisor hypomineralisation (MIH) was first introduced in 2001 by Weerheijm et al.⁵ Although the causative mechanism of MIH is still unclear, its clinical presentation of localised and asymmetrical lesions suggests do point out a systemic origin with the disruption in the amelogenesis process, which most probably occurs in the early maturation

stage or even earlier at the late secretory phase of tooth development.⁶ Due to its prevalence and it being a global concern, this present study was conducted with the aim to assess the prevalence of MIH in school children aged 8-12 years in District Bulandshahr, Uttar Pradesh, India

MATERIALS AND METHOD

The present study was designed as a cross-sectional study conducted among school children aged 8-12 in District Bulandshahr, Uttar Pradesh, India, after obtaining an ethical clearance and necessary approval from all school authorities. A total of four schools were selected on the basis forming cluster of schools and them selecting four schools at random using lottery method. Two government schools and two primary schools were selected as for convenience of examiners (convenience sampling). Students available on the day of the examinations were included in the study and those absent or unwilling to participate were excluded from the study. Children present on the day of examinations, with completely erupted first permanent molars and incisors and not suffering from any



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systemic conditions were included in the study.

The examinations were conducted by four standardized examiners (intra-examiner agreement: 0.83) as well as four standardized recording assistants. The examinations were conducted under natural light or artificial light incase of examinations in a room with low light. Data was entered into a pre-tested and pre-validated proforma. Data was coded and its access was only limited to the primary investigator. Confidentiality of data was assured to school authorities and only coded data was sent for statistical analysis.

Data on MIH was collected as per the scoring criteria recommended by EAPD (Ghanim et al.2011)⁷ and all hypomineralized lesions measuring more than 1 mm were recorded.

RESULTS

Out of 793 children, 186 were diagnosed with MIH (23.5%) with its prevalence reported to be more in boys (102, 54.8%) in comparison to girls (84, 45.2%) and this gender-based difference was observed to be statistically significant ($p=0.03$) there was an increasing frequency of MIH with increasing age. The highest percentage of MIH affected children were aged 12 years (43,23.2%). The number of children affected by MIH were more in government schools (104, 55.9%) as compared to private schools (82, 44.1%). However, the difference between the groups was statistically significant. Table 1.

Variable	Characteristic	p value
Male	102 (54.8%)	0.094*
Female	84 (45.2%)	
Total	186 (23.5%)	
Age (in years)		0.09
8	31 (16.7%)	
9	35 (18.8%)	
10	38 (20.4%)	
11	39 (20.9%)	
12	43 (23.2%)	
School Type		0.88
Government	104 (55.9%)	
Private	82 (44.1%)	

Table 1. Demographic details of the study population

Upon analysis, differences between the number of

affected maxillary (86) and mandibular teeth (100) affected with MIS was found to be statistically significant as per its location as per arch with teeth in the mandibular showing a statistically significant difference ($p=0.02$) and is depicted in table 2. However, no significant difference when a comparison was made between the right and left sides of the arches for both the molars and incisors as seen in table 3.

Teeth Affected	Arch		p value
	Maxilla	Mandible	
Molars	64 (74.4%)	71 (71%)	0.02*
Incisors	22 (25.6%)	29 (29%)	
Total	86 (46.2%)	100 (53.8%)	

Table 2. Prevalence of affected teeth by MIH according to arch

DISCUSSION

There is limited data on the prevalence of MIH in India and hence this study aimed to add important data to the existing literature. In the present study, the realence of MIH was reported to be 23.5%. This percentage is high as compared to the findings of Yannam SD et al. (9.7%)⁸ and Parikh DR et al. (9.2%).⁹ On the contrary, Rai PM et al. reported a prevalence of 13.2%.¹⁰

Teeth Affected	Right	Left	Total	p value
Molars	72(38.7%)	63(33.8%)	135 (72.5%)	0.54
Incisors	26(13.9%)	25(13.6%)	51(27.5)	0.99
Total	98(52.7%)	78(41.9%)	186(100%)	

Table 3. Prevalence of affected teeth by MIH according to jaw location (right and life

The age range taken in the present study of 8-12 years is recommended by the EAPD. In the present study a statistical difference was observed between females and males ($p=0.03$), which is in disagreement to Rai PM et al.¹⁰ A meta-analysis by Lopez et al. also confirmed that MIH was not not sex-related and females and males presented a non-significant difference as per results.¹¹

In the present study, a significant difference was observed regarding the prevalence of MIH between the maxillary teeth compared to the mandibular teeth ($p=0.02$), which is in disagreement with Yannam SD et al.⁸ and Jalevik et al.¹²

CONCLUSION

As per the results of the present study, periodic screening of school children is recommended to diagnose defects like MIH and provide prompt treatment if necessary.

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