

Molar incisor hypomineralization - A challenge of Pediatric Dentistry?

Catarina Ribeiro Barros de Alencar¹ & Alessandro Leite Cavalcanti.¹

Affiliations: ¹School of Dentistry, State University of Paraiba, Campina Grande, PB, Brazil.

Corresponding author: Alessandro Leite Cavalcanti. Department of Dentistry, School of Dentistry, State University of Paraiba, Avenida das Baraunas, S/N, Bodocongo, 58429-500, Campina Grande, PB, Brazil Phone: (55-83) 3315-3326. E-mail: alessandrouepb@gmail.com

Dental caries and developmental defects of enamel (DDE) are some of the major problems observed in primary dentition and young permanent teeth. Among them, Molar Incisor Hypomineralization (MIH) has been recorded as one of the most pressing issues affecting young patients. The term “Molar Incisor Hypomineralization” was adopted to describe a demarcated qualitative development defect of systemic origin that affects the permanent first molars that may be associated with permanent incisors, in order to unify the denomination of non-fluorotic or idiopathic hypomineralizations.

Unlike dental caries, the etiology of MIH remains unclear. However, it is known that this condition occurs in the mineralization stage of amelogenesis and has been associated with several possible etiological factors during the first years of a child’s life. Prenatal factors (like maternal smoking or illness during pregnancy), perinatal factors (like premature birth or low birth weight) and health-related factors in early infancy (like early childhood illness, being underweight and antibiotic use) are presumed to be involved. Furthermore the MIH etiology is considered multifactorial with environmental and genetic factors playing a role in this condition.

MIH has a high incidence worldwide, especially among children younger than 10 years old. However, studies around the world have shown that MIH rates have ranged widely even within the same country. Using the example of Brazilian capital cities, studies have shown MIH prevalence rates ranging from 2.5% to 9.12%.¹⁻³ This wide range may be justified by environmental and genetic diversity, among other factors, between different populations. In addition, it has been difficult to compare the studies due to the non-standardization in the use of indexes, criteria and age grouping.

In an attempt to minimize the use of different diagnostic criteria, members of the European Academy of Pediatric Dentistry (EAPD) decided that each tooth should be classified individually according to these criteria: absence or presence of demarcated opacities greater than 1mm, post-eruptive enamel breakdown, atypical restorations, molar extraction due to MIH or failure of eruption of molars or incisors.⁴ Besides, it was determined that the best age for diagnosis is from 8 years of age onward, when all molars have fully erupted. However, for preventive management purposes and in order to maintain tissue integrity, we recommend the an

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early clinical approach as soon as teeth erupt, which may occur before the age of 6 years old.

Clinically, MIH consists of opacities with a color variation (white/yellow/brown), which have edges that are remarkably clear and distinct from healthy enamel. At severe form post-eruptive enamel breakdown due to masticatory force, with rough margins, can be observed. The severity of MIH lesions is very variable, and the degree of porosity of the dental enamel is one of the determinants of the level of tissue disintegration, capable of leaving the dentin unprotected and causing intense dentin sensitivity with temperature variations or toothbrushing.

Thus, the enamel defect can lead to plaque deposits, favoring the development of caries, with consequent degradation of dental tissues, requiring atypical restorations or even tooth extractions. In individuals or populations with a high caries prevalence MIH can remain undetected due to the fast progression of the caries lesions, which eliminates the clinical signs of the hypomineralization. However, MIH is considered a risk factor for dental caries in populations with low levels of caries and both clinical conditions may coexist and can be differentiated as long as the MIH is not severe.

Therefore, children with MIH may go through important daily challenges since this condition negatively interferes in their quality of life due to facial appearance and pain. The MIH clinical management is challenging for the patients, the caregivers and the dentist. This is due to the difficulty in anesthetizing the affected teeth because of the subclinical inflammation of the cells of the pulp caused by the porosity of the enamel, and to the difficulty of restorative materials in

adhering to hypomineralized tissue.

Accordingly, some aspects such as hypersensitivity and behavioral problems should be considered in the treatment of MIH-affected teeth. MIH treatment requires a multidisciplinary approach and the treatment modalities described in the literature varies from preventive, restorative and extraction with or without subsequent orthodontic alignment of adjacent teeth.⁴

For affected molars, remineralization or sealants may be suitable for teeth not severely affected and/or without hypersensitivity. For severe cases, restorations with composites, indirect restorations or even preformed metal crowns may be suitable. Tooth extraction should be considered as a last resort and factors like the presence of a general malocclusion, the patients' age and the status of neighboring teeth should be taken into consideration as well. For incisors, desensitizing agents successful manage hypersensitivity and micro-abrasion or bleaching and composite veneers improve aesthetics, but no clear recommendations can be given for MIH incisors due to a lack of scientific evidence.⁵

In view of this, the occurrence of MIH evidenced by some epidemiological surveys and routinely found in dental practices, associated with the wide range of resulting complications and the lack of sufficient evidence to support any of the proposed etiological factors, point to the need for further investigation into MIH. In clinical matters, dentists need to consider the specific condition of each tooth and the needs and expectations of patients when deciding how to manage MIH, prioritizing whenever as possible preventive and minimally invasive or conservative treatments.

REFERENCES.

1. Nogueira Rodrigues FC, Batista Ribeiro PH, Abreu Fonseca Thomaz EB, Tobias Lima CQ, Moreno Neves PA, Costa Ribeiro CC. Molar-Incisor hypomineralization in schoolchildren of Sao Luis, Brazil Maranhao: Prevalence and associated factors. *Pesqui Bras Odontopediatr Clin Integr.* 2015;15:271-8.
2. da Silva Jr IF, Lima N, Conde WR, Soares da Silva L, Costa Arantes D, Silva do Nascimento L. Prevalence and severity of molar incisor hypomineralization in students of Belém, Brazil. *Braz Res Pediatr Dent Integr Clin.* 2015;15(1):377-85.
3. Hanan SA, Alves Filho AO, Medina PO, Cordeiro RCL, Santos-Pinto L, Zuanon ACC. Molar-Incisor Hypomineralization in Schoolchildren of Manaus, Brazil. *Braz Res Pediatr Dent Integr Clin.* 2015;15(1):309-17.
4. Lygidakis NA, Wong F, Jälevik B, Vierrou AM, Alaluusua S, Espelid I. Best Clinical Practice Guidance for clinicians dealing with children presenting with Molar-Incisor-Hypomineralisation (MIH): An EAPD Policy Document. *Eur Arch Paediatr Dent.* 2010;11(2):75-81.
5. Elhennawy K, Schwendicke F. Managing molar-incisor hypomineralization: A systematic review. *J Dent.* 2016;55:16-24.