

**2ND INTERNATIONAL CONFERENCE ON
PEDIATRICS & NEONATOLOGY
MARCH 20, 2025 | VIRTUAL EVENT**

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The genetic susceptibility to molar incisor hypomineralization

Abstract:

Molar Incisor Hypomineralization (MIH), characterized by enamel defects on molars and incisors, is a significant oral health problem in children. While the clinical consequences of MIH are well-documented, the exact causes of this condition remain poorly understood.

Objectives: This systematic review aimed to assess the potential association between MIH and specific genetic variations, known as single nucleotide polymorphisms (SNPs). To achieve this, we conducted a comprehensive search of major biomedical databases (PubMed, Scopus, Cochrane, and Web of Science).

Methodology: Studies included in this review met rigorous eligibility criteria. The methodological quality of each study was assessed using the STREGA guidelines. Data was extracted and analyzed systematically.

Results: Nine studies were included in the analysis. Among these, a genome-wide association study (GWAS) was conducted to identify genes involved in the genetic etiology of MIH. Another study used whole exome sequencing to explore genetic variations associated with MIH in more depth. The most frequently studied genes associated with MIH are those involved in enamel formation and mineralization, such as ENAM, AMBN, AMLEX, and MMP20. However, the results of the different studies are often contradictory. rs3796704.

Conclusion: MIH appears to result from a combination of genetic and environmental factors. Genetic variants associated with amelogenesis genes may contribute significantly to MIH susceptibility. Further clinical studies are needed to better understand the underlying genetic mechanisms of MIH and develop effective prevention strategies.

Biography

Rim Kallala is an associate professor at the Faculty of Dental Medicine. She teaches dental anatomy to first-year dental students. She is affiliated with the Department of Fixed Prosthodontics at the Monastir Dental Clinic in Tunisia. In addition to her teaching role, Dr. Kallala is also a researcher in the field of dentistry. She belongs to the laboratory Research: Biomechanical, aesthetic, and occlusal studies of all-ceramic restorations (LR16ES15). Her research focuses on advancing the field of dentistry, with a particular interest in dental aesthetics, digital technologies, and occlusal biomechanics. Dr. Kallala's work has significantly contributed to the understanding of the complex interplay between dental structure, function, and aesthetics. Her research has explored innovative techniques for dental restorations, the application of digital technologies in dental practice, and the biomechanical factors influencing dental treatments.