### UNIVERSITY OF UIC **ILLINOIS CHICAGO**

# Molar Incisor Hypomineralization and Dental Anomalies: A Case-Control Study

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## Background

#### **Molar Incisor Hypomineralization (MIH)**

- A prevalent enamel defect affects 13-14% of children worldwide<sup>1</sup>, with the highest prevalence in America and the lowest in Asia<sup>2</sup>.
- A multifactorial condition affecting molars (first permanent molars or second primary molars) with or without the involvement of permanent incisors.
- Characterized by white-to-yellow/brown demarcated opacities.
- It is associated with physical enamel disintegration, higher caries susceptibility, tooth sensitivity, higher dental treatment needs, and psychosocial concerns.
- Disruption during the maturation phase is the most likely period associated with hypomineralized enamel of first permanent molars (FPMs)

#### **Developmental Dental Anomalies (DDA)**

- Modifications or abnormalities occurring during phases of initiation, morphogenesis, and histodifferentiation may culminate in the manifestation of DDA.
- Most Common DDAs are hyperdontia and hypodontia.

# **Objectives**

Evaluate Chicagoan children with and without MIH and the correlation between:

- MIH and Adverse environmental & medical events in early life
- MIH and Co-existing Developmental Dental Anomalies (DDA)



Study was approved by UIC IRB (Protocol #2023-1293)



All examiners underwent training and calibration before data collection. Kappa values were between 0.76-0.89



New and recall patients aged 6-13 years with MIH and meeting eligibility criteria served as cases. Age- and gendermatched children without MIH were included as controls







the score point.

# Results

The study population comprised 56 subjects. The mean age was 9.32+/-1.89 years and 8.24+/-1.46 years in the MIH and control groups, respectively. Figure 2 shows the descriptive statistics of the cases and controls.



Figure 3: Subjects from the study population (MIH group) showing single or multiple DDAs



Ectopic maxillary premolar, short root anomaly, and taurodontism

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Figure 1. The diagnostic index proposed by Ghanim et al., 2015<sup>3</sup> is a 7-point scoring system, Enamel defect, Non-MIH [1], Diffuse opacity [11], Demarcated opacity (DO) White-Creamy [21] or Yellow-brown [22], Enamel breakdown [3], atypical restoration [4], atypical caries [5], extracted due to MIH [6], tooth cannot be scored [7] Number on tooth corresponds to





## Conclusion

This preliminary study demonstrates a significant association between MIH and the presence of DDAs. To confirm these findings, further research with a larger sample and multiethnic cohorts is needed.

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#### Association of MIH and DDAs

 
 Table 1 demonstrates the
prevalence of DDAs and missing third molars in children with and without MIH. Developmental Dental Anomalies were significantly associated with MIH ( $\chi^2 = 6.76$ , P = .0093). Figure 3 illustrates radiographic examples of MIH subjects with single or multiple DDAs. Figure 4 illustrates the breakdown of DDAs within the MIH group.

#### Association of MIH with early life risk factors

No significant differences were found in pregnancy, environmental, and early-life adverse events between the MIH and control groups (data not shown, Chisquare, p > .05)

Table 1: Frequency distribution of DDAs in the MIH and non-MIH groups. Abbreviations: DDA: Developmental Dental Anomalies, MIH: Molar incisor Hypomineralization

**Figure 4**: Frequency distribution of DDAs within the MIH groups. Abbreviations: DDA: Developmental Dental Anomalies, MIH: Molar incisor Hypomineralization

