

Molar-Incisor Hypomineralization and Developmental Dental Anomalies in U.S Children

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Background

There is growing evidence of a higher prevalence of Developmental Dental Anomalies (DDA) in children with Molar-Incisor Hypomineralization (MIH).^{1,2} However, there is minimal data from the United States on MIH and its co-occurrence with DDA.

Objectives

- To evaluate the association between MIH and co-existing DDA.
- To determine whether ethnic disparities exist between children with MIH/DDA and controls.

Methods

Study Approval

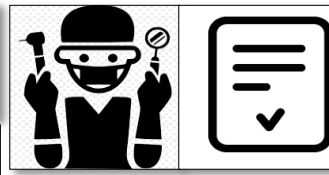


Study was approved by UIC IRB (Protocol #2023-1293)

Data Collection



Examiner's Calibration



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

Data was collected by clinical examinations, structured questionnaires (REDCap), and radiographic assessment.

Target Population

All initial and recall patients aged 6-14 years with or without MIH and meeting eligibility criteria.

Exclusion criteria

- ASA III/IV
- Craniofacial syndrome
- Cleft lip and palate
- Orthodontic treatment

Diagnostic Index

Examiners assessed first permanent molars and incisors using standardized diagnostic criteria.³

Results

The study population comprised 159 subjects (MIH n=86; Non-MIH, n=73). The mean ages were 9.32±1.89 and 8.24±1.46 years in the MIH and Non-MIH, respectively.

Association of MIH and DDAs

- Children with MIH had a significantly higher prevalence of any DDA compared to children without MIH ($p < 0.001$). SRA, microdontia, and taurodontism were significantly more frequent among MIH children ($p < 0.05$).
- Figure 2 illustrates the breakdown of DDAs within groups. Figure 3 illustrates radiographic examples of MIH subjects with single or multiple DDAs.
- MIH remained independently associated with the presence of any developmental anomaly after adjusting for birth country, gender, and ethnicity (aOR=4.52; 95% CI: 1.97–10.33; $p < 0.001$).

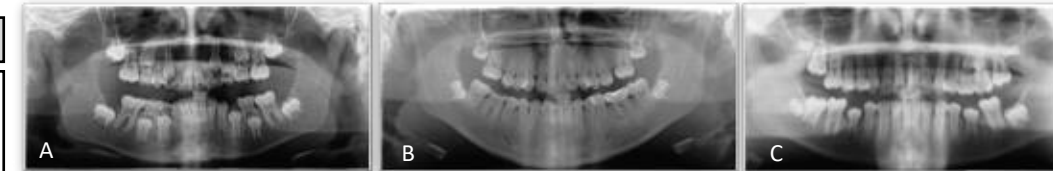


Figure 3: Radiographic examples of MIH subjects with localized (A) and generalized SRA (B). Subject C presents with SRA and taurodontism.

Results

DESCRIPTION OF THE STUDY GROUPS

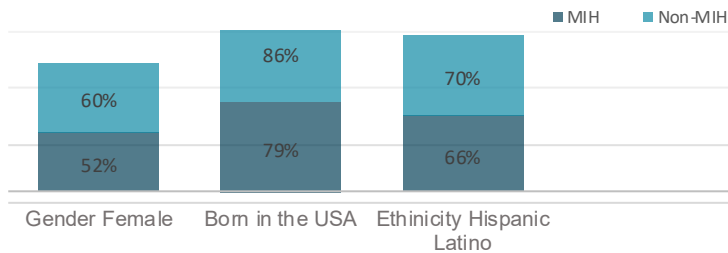


Figure 1: Summary statistics of the MIH cases (n=86) and Non-MIH (n=73) with no differences in gender, birthplace, and ethnicity ($p > 0.05$)

Prevalence (%) Distribution of DDAs per Study Group

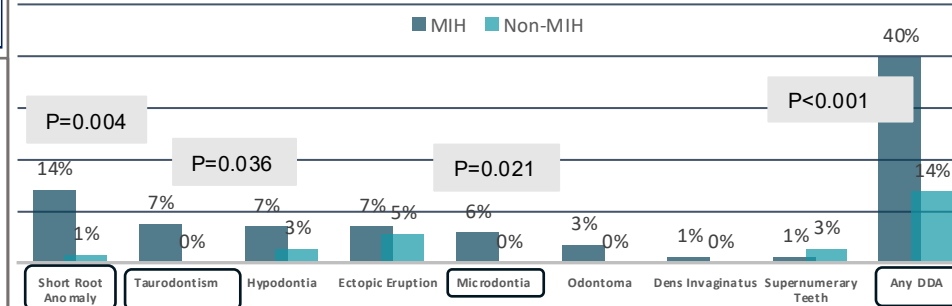


Figure 2: Frequency distribution of DDA in the MIH and non-MIH groups. SRA, taurodontism, and any DDA were significantly higher among MIH cases (Chi-Square, $p < 0.05$). Abbreviations -> DDA: Developmental Dental Anomalies

Conclusion

- This is the first study to report a higher prevalence of SRA in children with MIH.
- The overall prevalence of any DDA in this cohort was significantly higher in the MIH group than in children without MIH. MIH remained independently associated with the presence of any DDA after adjusting for country of birth, gender, and ethnicity.

References

