Molar Incisor Hypomineralization: Etiological Factors in Central Pennsylvania

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Background

Molar Incisor Hypomineralization is a developmental dental defect affecting individuals worldwide. It is characterized by white/yellow/brown opacities on at least one first permanent molar tooth and occasionally permanent incisors. Prevalence ranges from 4 – 18% depending on the literature.

Clinically, individuals affected by MIH often experience dental hypersensitivity and are at higher risk for breakdown and development of carious lesions. Restorative treatment of these teeth can present challenges for providers and patients.

MIH is believed to be of systemic origin with multifactorial etiology. Previous literature has shown associations between MIH and factors including prematurity, birth complications, early childhood illnesses, and medication usage.

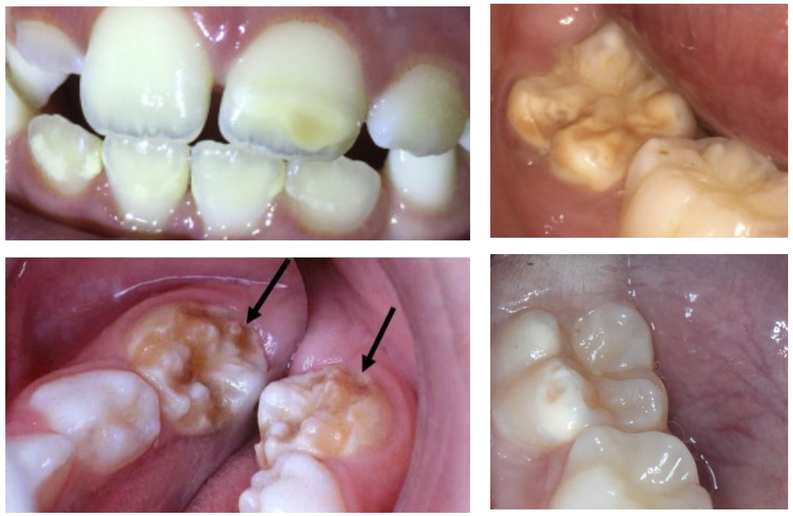
Several studies have cited conflicting results about possible etiologies behind MIH. While this is a global health issue, there have been limited studies within the United States.

Methods

A retrospective electronic chart review was completed on patients ages 6-17 who presented to Geisinger Medical Center for routine dental visits with MIH between 2011 – 2019.

One hundred six patients diagnosed with MIH fit inclusion criteria and the control group consisted of one hundred six patients with no MIH diagnosis.

Descriptive statistics were computed for demographic measures. SPSS was used for all statistical analysis. Chi Square analysis was used to evaluate the relationship between MIH and childhood medications as well as medical and birth history.



Results

Figure 1. Demographics

	All (N=212)	Control (N=106)	MIH (N=106)
Age			
Mean	12.8	12.5	13.1
Gender			
Female	112 (52.8%)	53 (50.0%)	59 (55.7%)
Male	100 (47.2%)	53 (50.0%)	47 (44.3%)

Figure 2. Medical History <Age 5

	All (N = 212)	Control (N = 106)	MIH (N = 106)	p-Value
Otitis Media	162 (76.4%)	77 (72.6%)	85 (80.5%)	p=0.340
URI	186 (87.7%)	91 (85.8%)	95 (89.6%)	p=0.611
Fever	179 (84.4%)	89 (84.0%)	90 (84.9%)	p=0.289

Figure 3. Birth History

	All (N = 212)	Control (N = 106)	MIH (N = 106)	p-Value
Delivery Method				
Vaginal	149 (70.3%)	67 (63.2%)	82 (77.4%)	p=0.935
C-Section	63 (29.7%)	39 (36.8%)	24 (22.6%)	
Gestational Age				
Full-term	175 (82.5%)	85 (80.2%)	90 (84.9%)	p=0.572
Pre-term	37 (17.5%)	21 (19.8%)	16 (15.1%)	
NICU Admission				
Yes	48 (22.6%)	27 (25.5%)	21 (19.8%)	p=0.138
No	164 (77.4%)	79 (74.5%)	85 (80.2%)	

Figure 4. Childhood Medications <Age 5

	All (N = 212)	Control (N = 106)	MIH (N = 106)	p-Value
Antibiotics	194 (91.5%)	96 (90.6%)	98 (92.5%)	p=0.342
Amoxicillin	175 (82.5%)	83 (78.3%)	92 (86.8%)	p=0.470
Penicillin	21 (9.9%)	8 (7.5%)	13 (12.3%)	P=0.253
Augmentin	175 (82.5%)	25 (23.6%)	25 (23.6%)	P=0.955
Azithromycin	175 (82.5%)	17 (16.0%)	24 (22.6%)	P=0.924
Albuterol	61 (29.8%)	27 (25.5%)	34 (32.1%)	p=0.752

Discussion

Results of the current study showed no significant association between MIH and subject medical history, contradicting findings from previous reports.

Due to the retrospective nature of this study, the data was not collected by calibrated examiners, which likely resulted in underdiagnosis of mild cases of MIH. There is also a lack of data on medical treatment that patients may have obtained outside of the Geisinger Health System.

More knowledge on MIH will facilitate the education of parents and medical providers of these children on the importance of establishing early and regular dental care and preventing future dental problems. Further research into etiology and risk factors of MIH is still needed. Future studies should consider a prospective design, larger sample size, and other potential etiological factors.

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