Original Research

Knowledge, Attitude, and Practice Regarding Molar-incisor Hypomineralization among Postgraduates and Faculty Members of K.M. Shah Dental College and Hospital, Vadodara, Gujarat, India

Kritika K Daryani, KS Poonacha, Anshula N Deshpande, Bhavna H Dave, Monika Khoja, Kinjal S Patel

Department of Pedodontics and Preventive Dentistry, K.M. Shah Dental College, Sumandeep Vidyapeeth, Vadodara, Gujarat, India

Abstract

Context: Molar-incisor hypomineralization (MIH) is a defect existing in the form of demarcated and opaque lesions and in severe cases with posteruptive enamel breakdown. There is a lack of knowledge, learning, and practice on MIH in pediatric dentistry. **Aims:** This study aimed to identify the knowledge, attitude, and practice on MIH among postgraduates and faculty members of K.M. Shah Dental College and Hospital, Vadodara, Gujarat, India. **Settings and Design:** A questionnaire-based study was conducted among the dental staff and postgraduate students of K.M. Shah Dental College. **Subjects and Methods:** The questionnaire was hand-delivered to all 142 participants, and they were asked to fill it within 5 working days. The questionnaire included demographic information, prevalence, incidence, and severity of MIH in Vadodara City. **Statistical Analysis Used:** Data analysis was done using SPSS version 20.0 (SPSS Inc., Chicago, IL, USA). The data were found to be normal by the Kolmogorov–Smirnov test. Intergroup comparison was done using the Chi-square test for proportions and percentages (qualitative data). **Results:** 43.3% of the respondents could not implement the clinical criteria to diagnose MIH, 92.5% of the respondents recommended to include MIH-associated case studies in the curriculum, 95% of the respondents recommended to conduct awareness programs, and 40.5% of the respondents indicated a lack of knowledge as a barrier for performing MIH management. **Conclusions:** There is a need for dentists to attend continuing dental education programs and various awareness programs on MIH and to introduce in-depth information on MIH-etiology and its treatment into the dental curriculum.

Keywords: *Attitude, continuing dental education, molar-incisor hypomineralization, opaque dental lesions, posteruptive enamel breakdown, questionnaire*

Received: March, 2019.
Accepted: May, 2019.

Introduction

Molar-incisor hypomineralization (MIH) has been coined by Weerheijm *et al.* (2001).[1] In the form of demarcation and opaque lesions, it is basically a tooth deformity. MIH results in a posteruptive breakdown of the enamel in severe cases. MIH is an enamel defect of a qualitative type, distinguished primarily as a hypomineralized type. Clinically, it is observed that the

Access this article online

Quick Response Code:

Website: www.jicdro.org

DOI: 10.4103/jicdro.jicdro_5_19

Address for correspondence: Dr. Kritika K Daryani, Department of Pedodontics and Preventive Dentistry, K.M. Shah Dental College and Hospital, Sumandeep Vidyapeeth, Vadodara - 390 019, Gujarat, India.
E-mail: kritikadaryani175@gmail.com

How to cite this article: Daryani KK, Poonacha KS, Deshpande AN, Dave BH, Khoja M, Patel KS. Knowledge, attitude, and practice regarding molar-incisor hypomineralization among postgraduates and faculty members of K.M. Shah Dental College and Hospital, Vadodara, Gujarat, India. J Int Clin Dent Res Organ 2019;11:26-31.

hypomineralized enamel is soft, porous, and brittle due to which it can easily be peeled off under the forces of mastication. In some cases, enamel peeling (posteruptive enamel breakdown) is so rapid that it appears as if the enamel was not formed initially. This condition may be confused with hypoplasia; however, in hypoplasia, the boundaries to the normal enamel are smooth, contrary to the posteruptive enamel breakdown condition, where the boundaries to the normal enamel are irregular.[2] The clinical appearance of the enamel defects may vary from white to yellow or brownish; however, the defects frequently depict an acute demarcation between the affected enamel and sound enamel. Moreover, the condition of MIH is also confused with fluorosis or amelogenesis imperfecta.[3] This is because there is a lack of knowledge, learning, and practice on MIH in pediatric dentistry. Hence, the present study was conducted to identify the knowledge, attitude, and practice on MIH among postgraduates and faculty members of the institute.

Objectives of this study

1. To evaluate knowledge, attitude, and practice regarding the MIH among the teaching faculty members and postgraduate students
2. To compare the knowledge, attitude, and practice regarding the MIH among the teaching faculty members and postgraduate students.

Subjects and Methods

A questionnaire survey was conducted among the dental teaching staff, both faculties with basic degree and master's degree and postgraduates, after receiving approvals from the Human Research Ethics Committee of the institution. A group of subject experts were randomly selected and were assigned to validate the questionnaire which was checked by two ways, namely content validity and concurrent validity. The content validity confirms that all the aspects of the tool were covered and the concurrent validity confirms that the tool was valid with more than 95% confidence (t = 1.00 and P = 0.417). A package containing an information brochure about the study, the questionnaire, and a plain language statement describing the study was hand-delivered by the first author to all potential participants (n = 142). An envelope was also included to facilitate responses. Participants were asked to complete the questionnaire in their own time and return it in a sealed envelope within 5 working days. The questionnaire consisted of two sections. In the first section, respondents were asked to provide sociodemographic information including the type of qualification, both undergraduate and postgraduate degrees. The second section included questions regarding perception and recognition of the MIH condition in Vadodara city, prevalence, incidence and severity of the defect, represented by its clinical presentation, clinical experience of MIH, and knowledge of possible etiological factors. The questionnaire also included questions about the prevalence of MIH in the second primary molars, the confidence of the respondents in diagnosing MIH, and views on the need for clinical training on enamel hypomineralization.

Analysis

The recorded data were compiled and entered into a spreadsheet computer program (Microsoft Excel 2007) and then exported to Data Editor page of SPSS version 20.0 (SPSS Inc., Chicago, IL, USA). The data were found to be normal by the Kolmogorov–Smirnov test. Intergroup comparison was done using the Chi-square test for proportions and percentages (qualitative data). The level of significance was set at 0.05, i.e., statistically significant.

Results

The sample size of this study was 142, of which 58 were staff members and 84 were postgraduate students. Of the total 142 participants, 22 did not respond (4 staff members and 18 postgraduate students), so total 120 participants were included in the study. The knowledge-based analysis was conducted based on five questions tabulated in Table 1.

Table 1 shows that the majority (68.3%) of the respondents showed higher awareness of the fact that MIH is a developmental defect of enamel and it differs from dental fluorosis and hypoplasia, higher percentage (47.5%) of the respondents were able to predict the prevalence between 5% and 10% of MIH in the community, higher percentage (57.5%) of the staff members and postgraduates identified genetic factor as an etiological factor causing MIH, majority (57.5%) of the respondents knew the clinical features of MIH, and higher percentage (43.3%) of the respondents could not implement the standard clinical criteria to diagnose MIH.

Table 2 shows that higher percentage (45%) of the postgraduate students agreed that MIH represents a clinical problem next to dental caries, whereas 27.5% said no, 17.5% of the postgraduate students were "not very confident" and 17.5% of the staff were "not confident" in diagnosing MIH teeth, higher percentage (37.5%) of the respondents depicted preparedness to diagnose MIH, maximum respondents (92.5%) suggested to include MIH-associated case studies in the undergraduate dental curriculum, and 95% recommended to conduct awareness programs.

Table 1: A questionnaire for knowledge-based analysis on molar-incisor hypomineralization

Questions	
Awareness that MIH is a developmental defect of enamel that differs from dental fluorosis and hypoplasia	
Yes	42 (35)
	40 (33.3)
	0.494 (not significant)
No	24 (20)
	14 (11.7)
Prevalence of MIH according to the respondent in their community	
<5%	24 (20)
	4 (3.3)
	0.011 (significant)
Between 5% and 10%	21 (17.5)
	36 (30)
Between 10% and 20%	21 (17.5)
	7 (5.8)
>20%	0
	7 (5.8)
Factor(s) involved in the etiology of MIH	
Genetic factors	33 (27.5)
	36 (30)
	0.096
Environmental contaminants	15 (12.5)
	15 (12.5)
Chronic medical conditions that affect mother/child during pregnancy	6 (5)
	9 (7.5)
Acute medical conditions that affect mother/child during pregnancy	3 (2.5)
	9 (7.5)
Antibiotics/medications taken by the mother during pregnancy	3 (2.5)
	9 (7.5)
Fluoride exposure	6 (5)
	0
Clinical features of MIH	
Yes	39 (32.5)
	30 (25)
	1.000 (not significant)
No	27 (22.5)
	23 (19.2)
Implementation of the clinical criteria to diagnose MIH	
Yes and know how to implement them	24 (20)
	10 (8.3)
	0.404 (not significant)
Yes but do not know how to implement them	27 (22.5)
	25 (20.8)
No	15 (12.5)
	19 (15.8)

MIH=Molar-incisor hypomineralization

Table 2: A questionnaire for attitude-based analysis on molar-incisor hypomineralization

PG students (%)	
MIH represents a clinical problem that could come next to dental caries in public health concern	
Yes	54 (45)
	21 (17.5)
	0.003* (significant)
No	12 (10)
	33 (27.5)
Level of confidence while diagnosing MIH teeth	
Very confident	15 (12.5)
	3 (2.5)
	0.045* (significant)
Confident	15 (12.5)
	18 (15)
Not confident	15 (12.5)
	21 (17.5)
Not very confident	21 (17.5)
	6 (5)
Multiple options selection	0
	6 (5)
Preparedness to diagnose MIH	
Yes, in initial and advanced stages	24 (20)
	21 (17.5)
Yes, only in initial stages	18 (15)
	15 (12.5)
	0.899 (not significant)
No	24 (20)
	18 (15)
Suggestion for including MIH-associated case studies in the undergraduate curriculum topics of the pediatric dentistry subject	
Yes	60 (50)
	51 (42.5)
	0.202 (not significant)
No	6 (5)
	3 (2.5)
Any awareness program to be carried out to understand MIH	
Yes	63 (52.5)
	51 (42.5)
	0.373 (not significant)
No	3 (2.5)
	3 (2.5)

*$P \leq 0.05$ (Significant). MIH=Molar-incisor hypomineralization

Table 3 shows that higher percentage (42.5%) of the respondents suggested dental journals as an extensive informative source of MIH, 72.5% of the respondents

Table 3: A questionnaire for practice-based analysis on molar-incisor hypomineralization

	Staff (%)
Sources of information regarding MIH	
Dental journals	24 (20)
	27 (22.5)
	0.349 (not significant)
Continuing dental education	9 (7.5)
	3 (2.5)
Brochures or pamphlets	0
	0
Internet	21 (17.5)
	12 (10)
Books	6 (5)
	0
Multiple options selected	6 (5)
	12 (10)
Detection of hypomineralized teeth in your practice	
Yes	51 (42.5)
	36 (30)
	0.387 (not significant)
No	15 (12.5)
	18 (15)
Frequency of noticing hypomineralized teeth in your practice	
Daily	0
	3 (2.5)
	0.581 (not significant)
Weekly	9 (7.5)
	6 (5)
Monthly	39 (32.5)
	33 (27.5)
Yearly	18 (15)
	12 (10)
Severity of the defect; which of the following do you most frequently notice in your practice	
White demarcation	27 (22.5)
	21 (17.5)
	0.931 (not significant)
Yellow/brown demarcation	36 (30)
	30 (25)
Posteruptive breakdown	3 (2.5)
	3 (2.5)
Incidence of hypomineralized teeth has increased over the period of your practice	
Yes	18 (15)
	30 (25)
	0.047* (significant)
No	48 (40)
	24 (20)
In practice, encounter of demarcated hypomineralized defects in permanent teeth other than the first permanent molars and incisors	
Yes	27 (22.5)
	15 (12.5)
	0.458 (not significant)
No	39 (32.5)
	39 (32.5)
Frequency of observing this defect in the second primary molar tooth in comparison to the first permanent molar tooth	
More frequently	0
	0
	0.099 (not significant)
Less frequently	66 (55)
	48 (40)
Same as first permanent molar	0
	6 (5)
Type of material often used in treating MIH tooth	
Amalgam	0
	0
	0.305 (not significant)
Composite resin	21 (17.5)
	27 (22.5)
Glass Ionomer cement	15 (12.5)
	6 (5)
Compomer	0
	6 (5)
Preformed crowns	30 (25)
	15 (12.5)
Representation of a barrier for performing MIH management	
Dental treatment that needs long time to be accomplished	12 (10)
	3 (2.5)
	0.218 (not significant)
Patient's attitude toward the defect	12 (10)
	18 (15)
Insufficient training to treat children with MIH	15 (12.5)
	15 (12.5)
Lack of knowledge	27 (22.5)
	18 (15)
Treatment of a patient with MIH in practicing in dental school training clinic	
Yes	12 (10)
	12 (10)
	0.966 (not significant)
No	54 (45)
	42 (35)

Contd...

Contd...

*$P \leq 0.05$ (Significant). MIH=Molar-incisor hypomineralization

noticed hypomineralized teeth in their practice, maximum percentage (60%) of the respondents noticed hypomineralized teeth in their practice every month, 66% of the respondents noticed a defect in the form of yellow/brown demarcation, and 25% of the staff members felt that the cases of hypomineralized teeth have increased in their practice, whereas 40% of the postgraduate students had not noticed any increased incidence, majority (65%) of the respondents encountered demarcated hypomineralized defects in the first permanent molar and incisors, maximum percentage (95%) of the respondents had noticed the defect less frequently in the second primary molar tooth, majority (40%) of the respondents would choose composite resin for the treatment, 40.5% represent lack of knowledge as a barrier for performing MIH management, and 80% of the respondents had not treated a patient with MIH in their dental school training.

From Table 4, it can be observed that there is a considerable variation regarding opinions and the clinical management of MIH. Hence, practice cannot be compared between both the groups, i.e., staff and postgraduates.

Discussion

In the present study, we examined the awareness of MIH among dentists in K.M. Shah Dental College and Hospital. The study conducted by Allazzam *et al*., in 2014,[4] illustrates MIH as a significant clinical problem. The study has illustrated that demineralization of enamel makes the tooth sensitive, which, in turn, makes it vulnerable to caries.

It was observed that as many as 68% of the respondent dentists were able to differentiate MIH from dental fluorosis and hypoplasia. The findings of this study have shown a prevalence rate of MIH to be in between 5% and 10% in our community. The findings are substantiated by Bhaskar and Hegde in 2014[5] and Parikh *et al*. in 2012,[6] showing a prevalence rate of 9.46% and 9.2% in their respective studies.

In the present study, dentists indicated that genetic factors cause MIH; also, recent studies indicate that genetic factors are likely to play a significant role in causing MIH (Jeremias *et al*. in 2013[7] and Kuhnisch *et al*. in 2014). On the contrary, Crombie *et al*. in 2008[8] reported maternal and child illness as a cause of MIH in their study. It was observed that 32.5% of the dentists reported MIH to be next to dental caries in public health terms and effectively placed it under other oral conditions, such as periodontal disease, dental trauma and oral cancers.

Table 4: Knowledge-based analysis and attitude-based analysis between postgraduate students and staff members

Group	Knowledge		Attitude	
	Mean	SD	Mean	SD
PG	74.46	20.49	75.44	20.76
Staff	80.38	28.1	66.66	27.75

SD=Standard deviation

The present study illustrated that many dentists reported yellow/brown opacities as an indication of MIH. This result was found to be consistent with the study carried out by Hussein *et al*. in 2014.[9] Furthermore, many dentists preferred using composite resin for the restoration of MIH-affected teeth. Bagheri *et al*. in 2014[10] reported that similar material has been indicated in the recent survey of Iranian dentists and academics for the restoration of MIH-affected teeth. The study conducted by Lygidakis *et al*. in 2010[11] suggests the use of metal as the best restorative option for moderately and severely affected teeth by MIH. It was found that many (37.5%) respondents lacked knowledge on MIH management and not a single patient with MIH was treated by 80% of the respondents.

After comparing knowledge and attitude among staff and PG, it was observed that knowledge on MIH was higher in staff as compared to that of PG [Table 4]. Similarly, after comparing attitude among staff and PG, it was observed that PG showed a more positive attitude in gaining information on MIH as compared to that of staff.

The findings from this study divulge that there is very less exposure to MIH in the undergraduate program of the dental curriculum. Furthermore, despite the growing awareness on MIH, it is yet not covered in depth in the undergraduate dental curriculum. The present study illustrates that without a comprehensive clinical exposure to MIH in the undergraduate training, future dentists will face similar challenges in terms of managing patients with MIH. Due to this, many dentists were found to be not confident enough in diagnosing teeth with MIH. From the findings of the present study, it can be recommended that MIH-associated case studies should be included in the undergraduate curriculum topics of the pediatric dentistry, and awareness program should be carried out to understand MIH by means of continuous dental education programs.

Conclusions

The present study concludes that dental teaching staff relatively possess a higher knowledge of MIH than the postgraduate students, who relatively showed a more positive attitude for gaining information on

MIH. Furthermore, very less exposure to cases of MIH resulted in respondents facing difficulties in properly diagnosing the condition in their dental practice. Hence, it is recommended for the dental professionals to attend continuing dental education programs and various awareness programs based on MIH and to introduce in-depth information on MIH, its etiology, and its treatment into the dental curriculum at the undergraduate level.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Ghanim A, Morgan M, Mariño R, Manton D, Bailey D. Perception of molar-incisor hypomineralisation (MIH) by Iraqi dental academics. Int J Paediatr Dent 2011;21:261-70.
2. Rao MH, Aluru SC, Jayam C, Bandlapalli A, Patel N. Molar incisor hypomineralization. J Contemp Dent Pract 2016;17:609-13.
3. Weerheijm KL. Molar incisor hypomineralization (MIH): Clinical presentation, aetiology and management. Dent Update 2004;31:9-12.
4. Allazzam SM, Alaki SM, El Meligy OA. Molar incisor hypomineralization, prevalence, and etiology. Int J Dent 2014;2014:234508.
5. Bhaskar SA, Hegde S. Molar-incisor hypomineralization: Prevalence, severity and clinical characteristics in 8- to 13-year-old children of Udaipur, India. J Indian Soc Pedod Prev Dent 2014;32:322-9.
6. Parikh DR, Ganesh M, Bhaskar V. Prevalence and characteristics of molar incisor hypomineralisation (MIH) in the child population residing in Gandhinagar, Gujarat, India. Eur Arch Paediatr Dent 2012;13:21-6.
7. Jeremias F, de Souza JF, Silva CM, Cordeiro Rde C, Zuanon AC, Santos-Pinto L. Dental caries experience and molar-incisor hypomineralization. Acta Odontol Scand 2013;71:870-6.
8. Crombie FA, Manton DJ, Weerheijm KL, Kilpatrick NM. Molar incisor hypomineralization: A survey of members of the Australian and New Zealand society of paediatric dentistry. Aust Dent J 2008;53:160-6.
9. Hussein AS, Ghanim AM, Abu-Hassan MI, Manton DJ. Knowledge, management and perceived barriers to treatment of molar-incisor hypomineralisation in general dental practitioners and dental nurses in Malaysia. Eur Arch Paediatr Dent 2014;15:301-7.
10. Bagheri R, Ghanim A, Azar MR, Manton DJ. Molar incisor hypomineralization: Discernment of a group of Iranian dental academics. J Oral Health Oral Epidemiol 2014;3:21-9.
11. 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;11:75-81.