



Prospects of MICAP Notation in Dental Charting; A Qualitative Study

Muhammad Hamza Saeed¹, Rahmatullah Khan², Mohammad Umar Shah², Ashfaq Akram^{1*} and Fadia Butt¹

¹Islamic International Dental College, Riphah International University, Islamabad, Pakistan

²Frontier Medical and Dental College, Abbottabad, Pakistan

***Corresponding Author:** Ashfaq Akram, Assistant Professor, Department of Pediatric Dentistry, Islamic International Dental College, Riphah International University, Islamabad, Pakistan.

Received: May 15, 2017; **Published:** June 20, 2017

Abstract

Introduction: Multiple tooth notations are used in dental settings to diagnose and communicate dental problems. A new tooth notation called MICAP has been introduced which gives identification of teeth by using letters (I-incisor, C-canine, P-premolar and M-molar,) and numbers (1, 2, 3) which are superscripted and subscripted on the associated letters. Its feasibility and practicality have been assessed by number of quantitative methods.

Aim: to explore further the understanding and perspective of MICAP notation for its clinical usage in future by academic members i.e., dental specialists and consultants.

Methodology: A qualitative approach was adopted. Semi structured, face to face interviews were conducted with (n = 21) dental specialists and consultants from three dental schools located in Abbottabad and Federal territory of Islamabad – Pakistan. Data analysis involved the breaking down interview debriefing into themes and codes and specified as respondents.

Results: Over all, academic staff members gave their beliefs and perception towards MICAP notation as simple and easier to understand, if adopted clinically, error free communication is expected. Dental charting by MICAP notation for some specialties was raised as concerned factor for its clinical practice.

Conclusion: the new notation is based on dental terminologies which are used worldwide; it could be a global notation. However, it should be included in undergraduate dental course before it is adopted for clinical usage.

Keywords: MICAP Notation; Dental Charting; Dental Faculty; Dental Communication

Introduction

Incisors, canine, premolars and molars are the dental terms used globally for all human teeth. Considering permanent teeth, there are two incisors, one canine, two premolars, and three molars in each quadrant and identified by one of notations namely FDI two-digit notation, Universal numbering system and Palmer notation. These notations are used in different parts of the world. Universal numbering is more common in the US and Canada, while Palmer notation is commonly used in Asian countries while FDI is popular in European region and many other countries. Though there is no restriction in usage of any one of the notation by any country or dental practitioner, similarly no strong limitation of any notation in any part of the world is found.

Dental charting is based on a tooth notation which is comprised of numbers or letters when referred to a particular tooth notation for each tooth. For example, #3 is designated for permanent upper right first molar (Universal system). Letter 'A' indicates deciduous central incisor in Palmer notation. Referring to FDI system, # 26 means permanent upper left first molar. Symbols, acronyms and abbreviations are often used in dental charting.

Tooth notation is a basic guideline from diagnosis to treatment of dental patients. A few years ago, MICAP, a new tooth notation, was developed. It was designed using first letters of each tooth class. Therefore, MICAP is the abbreviation of M- molar, I-incisor, C-canine, P- premolar and A- akram (the dentist) [1,2]. The capital letters (I, C,

P, M) are typed to indicate the respective tooth class while relevant tooth types are indicated by numbers (1, 2, 3) and written as superscript or subscript on right or left side of the letters. For instance, permanent upper and lower molars are presented.

Maxillary Molars
 321 123
 # **M**
 321 123
 Mandibular Molars

The format of MICAP #M¹²³ is for the upper left first, second and third molar which could be read 'at M, upper left 123 (one two, three- Not one twenty-three)'. A hash sign (#) is used along with letters which differentiates two or more than two tooth classes as well as from the word text in case of making a referral. Its practicality has been assessed by quantitative methods in different institutions [2-7].

There is no previous study which investigated the qualitative aspects of new (MICAP) notation. Therefore, this study was conducted in order to investigate and evaluate its formation, usage in dental charting and communication of dental purposes and other relevant aspects of its strengths and weakness at three dental schools in frontier province and federal territory of Islamabad-Pakistan. This study was approved by the ethical committee of the Islamic International Dental College – Riphah International University, Islamabad. The written consents were obtained before data collection. The data was obtained by following ethics of codes of World Medical Association (declared in Helsinki).

Methodology

An action research model within the domain of qualitative research was adopted for this study. Semi structured, face to face detailed interviews were conducted with (n = 21) faculty members from (Ayub medical and dental college n = 8, Frontier medical and dental college n = 10, Islamic international dental college n = 3) between August and September 2016 to assess their attitudes, beliefs and perceived acceptability of strength and weakness of MICAP notation. The faculty members were having recognized postgraduate qualification and minimum two years working experience in respective specialty.

Setting and Participants

The study took place at three dental colleges; Ayub medical and

dental college, Frontier medical and dental college and both are located in frontier province while Islamic international dental college is located in federal territory of Islamabad - Pakistan.

Procedures

Restorative, orthodontics, oral and maxillofacial and periodontal faculty members having postgraduate qualifications and minimum two years of academic experience were approached with appointments in their offices and invited to participate in the study. Before interview, written consents were obtained and the purpose of the study was described. They were explained the MICAP with the help of a short video, power point slides describing its formation, examples to identify the teeth and how it could be written in oral diagnosis (dental charting). Later semi-structured interviews lasted between 15 - 25 minutes and were audiotaped and short notes were also made which were subsequently transcribed verbatim. Qualitative thematic content analysis was done. A preliminary coding scheme was developed which facilitated the systematic identification of analytic patterns that became apparent from the data as well as theoretically important concepts. Limited demographic information was obtained from participants. Analysis involved breaking down the data into themes which were transcribed into codes and the numbers of respondents (R) were specified.

Results

Referring to gender based, n = 13 (62%) were female while n = 8 (38%) % were male. Almost half respondents were faculty members with five to eight years' clinical experience. Thirty percent participants had more than two but less than five years' experience. Remaining twenty percent had more than ten years of clinical experience.

Analysis of the interview transcripts revealed eight main themes: 1) Formation of MICAP Notation, 2) MICAP in Dental Charting, 3) Dental Communication and Problems with MICAP, 4) MICAP and Different Specialties, 5) Recommended as Global System, 6) Recommendation of MICAP as Compared to Other Systems, 7) Weakness of MICAP Notation, and 8) Suggestions for MICAP Notation.

Theme 1: Formation of MICAP Notation

All study participants expressed very positively that formation of new notation (MICAP) was simple, easier to understand, less chances of error and unique from existing systems. Majority thought it was easy, simple and accurate as the following statements illustrate, "I think, it is very powerful and easy method and should be used" (R2). "It is easy understanding for teaching and clinical purpose"

(R4). "In my opinion, it is very simple, easy method to convey and make other professionals understand" (R9).

Theme 2: MICAP in Dental Charting

All participants agreed that MICAP was the system that could be used in dental charting. "It is good for students, technicians, and doctors and even for patients. They would understand what teeth have problems....." (R17). "In my humble opinion, it's nice M means molar, no need to remember numbers.....", (R8). Another participant stated, "Yes, can be very easily used in dental charting because much easier" (R1). "The dr should contact Microsoft office for creating a dental charting based on MICAP.....", (R5) stated and referred to the dentist who designed the notation.

Theme 3: Dental Communication and Problems with MICAP

Majority agreed that using MICAP manually which is common in Pakistan wouldn't be a problem. Participants raised a number of issues related to MICAP communication electronically. One participant stated, "I wonder how to write superscript or subscript number with a letter for multiple teeth because our dental office staffs are not trained..... I think, there should be training for this notation", (R9). Another participant thought of workshops to be organized for this notation. "How I can tell to my assistant for #M₁₂..... and upper and lower teeth.... e.g. #¹P₁₂ (R17). Several participants agreed that training must be offered to faculty as well as supporting staff so that there is harmony in dental communication.

Theme 4: MICAP Associated with Different Specialties

More than fifty percent commented as convenient to their specialty, however, some didn't comment, which might be the lack of understanding from communication point of view. "Yes, it can be but it will take time and it should be introduced at undergraduate course books" (R6). I think, restorative, endodontic, perio seem to be ok for this notation, I'd probably be wondering for prosthetic because it wouldn't be like endo or restorative charting,..... may be guy has some idea how to incorporate prosthetics in MICAP charting for example, Kennedy's class II or III how to mark in MICAP", (R 20). One member from orthodontics gave comments, "MICAP protocol is doctors' friendly. In my opinion, instead of numbering, MICAP is more helpful in understanding which is missing, crowded etc" (R8). Another participant stated, "Nice, it would be easy to take history of mixed dentition wow." (R2).

Theme 5: Recommended as Global System

All respondents agreed that it could be used globally except one (R4). Participants positively argued to be its global usage. One participant stated, "I strongly believe because the terms incisor, canine and molar are globally used, and where you travel, you can inform the doctor about your teeth, there is possibility the accent is different in pronouncing the incisor or canine but canine is canine and letter C means canine", (R13). However, some faculty members were not sure about its recognition by FDI or ADA and worldwide usage. They didn't mention the reason.

Theme 6: Recommendation of MICAP Compared to Other Systems

In Pakistan, Palmer notation is commonly practiced in dental institutions and practices. However, in undergraduate dental programme, other notations (FDI and Universal systems) are also taught. "In Palmer notation, teeth numbering for permanent (1-8) and for primary teeth (A-E) clicked in mind as I have been practicing for twenty years" (R12). Giving missing, crowded, mixed dentition, all respondents agreed on MICAP for its usage for all situations. However, some suggested Universal as alternative. "Both are easy and helpful" (R7). "MICAP looks easy as compared to Universal especially for mixed dentition because we are not practicing it (pointed towards Universal notation) in Pakistan, so it is quite complicated to dictate if mixed dentition or some teeth are missing" (R17). Another participant stated, "I feel it is better than Universal and FDI notation, at least something new and comparatively easy" (R2).

Theme 7: Weakness of MICAP Notation

When asked about the weakness of the new notation, participants were comparing MICAP with Palmer notation. Here it is important to mention that Palmer notation is commonly practiced in Pakistan. One said simply, "Palmer notation is commonly used in Pakistan and students, doctors know and use palmer notation commonly. So, it (MICAP) may not be easily accepted" (R13). Another respondent stated "I think.....as compared to other numbering systems, MICAP is a new chapter. It will take time to be introduced in dental field" (R3). "I see, it (MICAP) cannot be written easily and I think, how to find anatomical midline..... it is not maintained in it" (R9). "I don't see any weakness found, yes, maybe we need some experience to understand and use it" (R7). Another participant pointed out its name "Instead of MICAP, if it is written as ICPM, then it will be easy and will point out the position of teeth in each quadrant starting from midline" (R11).

Theme 8: Suggestions for MICAP Notation

Referring to this theme, many participants were unanimous and didn't say much. Few suggested, it should be introduced in course book of oral anatomy and should be included in preclinical training of students. One suggested simply, "I don't find any error, simply it should be included in text book of oral anatomy and implemented in dental practice..... it is good idea.", (R19). Another participant pointed out, "why not it should be ICPM rather than MICAP" (R2, 11).

Discussion

MICAP was positively reported and discussed by participants. They expressed their feelings and beliefs that it was a new idea and since it was based on dental terminologies which are globally taught in all dental schools, it would be an addition in the current dental charting systems. The findings are consistent with recent studies on new notation [3-7].

Getting opinion on new notation was a challenge. It was like to develop consensus on the usage of new notation. Majority participants agreed on its formation. Since it was based on names of teeth, many abruptly gave their perception as 'easy'. The faculty members had an opinion that new notation could identify teeth and should be used in dental charting which is a basic fundamental procedure and all students and professionals learn and practice it. This result is comparable with the competencies defined by General dental council of UK and the study findings of the Newcastle University where they reported that their students developed basic skills in diagnostic procedure [8,9].

Challenges are faced by dental professionals and educationists in terms of developing a global notation. Improving the dental care of the patients has been the utmost objective of dental associations. Many faculty members suggested to adopt MICAP as global notation because it is based on dental terminologies which are constant and used globally. Looking at the notation issue, it was suggested to combine Palmer and FDI notation. For this purpose, some modifications were made and UL7 [27] was proposed to indicate maxillary left second molar. However, great difficulty was observed to mark multiple teeth. To change or adopt a new notation, debate held in 90s [10-12] and it again started earlier this decade giving a revival of notation [13,14].

Studies have indicated poor communication among dental specialists and between medical and dental health profession-

als [15-18]. The result of this study indicated the importance of being a global notation which could be used by dental, medical and other health professionals such as forensic personals. It has also been observed that medical doctors having little formal training in dental conditions are not confident to assess and make referral using dental charting [16,17]. Having been incorporated with medical terms, there is strong possibility that it wouldn't be a problem for medical and other health professionals who could be involved in dental communication such as forensic professionals who likely report dental data once a need is arisen as reported earlier [4].

Considering the factors of malpractice, unclear notation mixed dentition and missing molar tooth are known risk factors [19,20]. Keeping in view the notation, In US, orthodontists and oral surgeons use two different notations. For orthodontist, upper right first premolar is tooth # 4 (Palmer notation) while the oral surgeons, using Universal numbering notation, gives #5 to the same tooth [12]. In our study, participants agreed there should be a global notation. Since MICAP notation is based on standard terminologies; incisor, canine, premolar, molar, it could be adopted as global notation. In all dental and medical curricula, incisor is incisor; C means canine and M means molar. It could be discussed in FDI meeting taking all its aspects regardless its origin.

Limitations

The findings of this study should also be viewed in light of some limitations. The study setting was multicenter in Pakistan where experienced faculty members took part in the study. Faculties from other dental schools across the country were not represented and their perspectives were not reflected in the data. Faculty members from restorative, orthodontics, oral and maxillofacial and periodontology were included. Members from other faculties such as oral biology, oral diagnosis, prosthetics, pediatric and endodontics should have been included to obtain a broader picture of the strengths and weakness of the system in terms of clinical application and interdepartmental communication. Also, MICAP dental charting for general procedures was included and some participants highlighted the specific dental charting related to each specialty. Thus, inclusion of specific dental charting would have a clear understanding of faculty members of those specialties which were not included. The participants in this study were mainly from dental profession. Medical and forensic specialists should have also been included. It was another limitation of the study.

Conclusion

This qualitative study used MICAP notation as a scenario which is new niche in the dental diagnosis. All dental academic members of this study showed that MICAP was simple and easy to understand and an error free dental communication was possible because it used dental terminologies (incisor, canine, premolar, molar) which are constant in all dental curricula. For its usage in dental practice as well as academic purpose, concerned raised by faculty members was its inclusion in the dental curriculum and training to dental students, paramedics and academic staff along with specific dental charting for each specialty.

Further Study

Further study is suggested either qualitative or quantitative which may involve medical, forensic, insurance companies and medico legal lawyers for communication through MICAP notation.

Conflict of Interest

All authors declare no conflict of interest.

Source of Funding

Nil.

Bibliography

1. Akram A., et al. "MICAP – a novel system for identification and communication of dental problems". *International Dental Journal* 61.1 (2011): 31-36.
2. Akram A., et al. "Lesson plan on new method of teeth identification introduced at dental schools in Malaysia and Pakistan". *Journal of Dental Education* 76.12 (2012): 1691-1696.
3. Akram A., et al. "Identification of primary teeth by 'MICAP' a new tooth notation system". *Paediatric Dental Journal* 25 (2015): 39-44.
4. Deepthi K and Deepa G. "Comparison of two systems of tooth numbering among undergraduate dental students". *Indian Journal of Dental Research* 27.4 (2016): 378-382.
5. Akram A., et al. "Comparison of the learning of two notations: A pilot study". *Journal of Advanced Medical Education and Professionalism* 5.2 (2017): 67-72.
6. Akram A., et al. "An assessment of clinical application of a new tooth notation for primary teeth". *Journal of International Dental and Medical Research* 8.1 (2015): 7-14.
7. Akram A., et al. "Learning of format of new tooth notation system- a pilot study". *International Journal of Dental Science and Research* 3.4 (2015): 92-95.
8. Bailit HL., et al. "U.S State-supported dental schools: financial projections and implications". *Journal of Dental Education* 70.3 (2006): 246-257.
9. Cerny R., et al. "A survey of patient opinions on fixed vs removable retainers". *Journal of Clinical Orthodontics* 43.12 (2009): 784-787.
10. Elderton RJ. "Keeping up to date with tooth notation". *British Dental Journal* 166.2 (1989): 55-56.
11. Peck S and Peck L. "A time for change of tooth numbering systems". *Journal of Dental Education* 57.8 (1993): 643-647.
12. Pogrel MA. "Tooth notation". *British Dental Journal* 195.7 (2003): 360.
13. Havale R., et al. "Dental notation for primary teeth: A review and suggestion of a novel system". *European Journal of Paediatric Dentistry* 16.2 (2015): 163-166.
14. Sarjeev S Y and Sapna S. "Sarjeev's supernumerary tooth notation system: A universally compatible add-on to the Two Digit system". *Indian Journal of Dental Research* 24.3 (2013): 395-396.
15. Ricketts DNJ., et al. "Peer review amongst restorative specialists on the quality of their communication with referring dental practitioners". *British Dental Journal* 195.7 (2003): 389-393.
16. Blinkhorn AS., et al. "An investigation into the use of the FDI tooth notation system by dental students in the UK". *European Journal of Dental Education* 2.1 (1998): 39-41.
17. Patel KK and Driscoll P. "Dental knowledge of accident and emergency senior house officers". *Emergency Medical Journal* 19.6 (2002): 539-541.
18. McCann PJ., et al. "Training in oral disease, diagnosis and treatment for medical students and doctors in the United Kingdom". *British Journal of Oral and Maxillofacial Surgery* 43.1 (2005): 61-64.
19. Lee JS., et al. "Prevention of wrong-site tooth extraction: clinical guidelines". *Journal of Oral and Maxillofacial Surgery* 65.9

(2007): 1793-1799.

20. Chang HH, *et al.* "Effectiveness of an educational programme in reducing the incidence of wrong site tooth extraction". *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology* 98.3 (2004): 288-294.

Volume 1 Issue 1 June 2017

© All rights are reserved by Ashfaq Akram., *et al.*