

Implementation of CAMBRA Protocols by Dental Fraternity in Three Major Cities of Pakistan

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Abstract

Caries is a multifactorial disease which has been conventionally treated in the past by surgical intervention as a primary measure to treat it. In-depth knowledge about cariology, biomaterial sciences and innovative technology, makes it possible to manage caries without drilling. The currently recommended philosophy of caries management is termed as CAMBRA. In USA, UK and many European countries, it is being practiced by dental clinicians but evidence reveals that it has not gained acceptance from dentists in the subcontinent, especially Pakistan. This study was planned to assess whether dental fraternity in Pakistan follows the new philosophy or treats caries in a traditional drill - fill manner.

Material and Methods

A meticulously prepared pretested questionnaire was used as a study tool. It was distributed among 750 practicing dentists in three cities of Pakistan. The Sample size of the study was determined by

using non-probability convenient sampling. Responded questionnaire received during 1st April - 31st August 2017 were included in the study.

Results

The results show that the total CAMBRA protocols are not followed by any responding dentist and insignificant number of dental practitioner follows few of them.

Conclusion

Most of the dentists who participated in the study have not implemented CAMBRA philosophy in their clinical practices.

Introduction

CAMBRA is an evidence-based disease management protocol for Caries Management by Risk Assessment [1]. It emphasizes on treating and preventing the cause of caries at an initial phase to avoid permanent damage to the tooth tissue due to “cavitation” destruction. Caries risk assessment (CRA) identifies pathological factors for caries initiation and a proficient practitioner employs protective measures that discontinues its progression or remineralizes the invisibly demineralized tooth without visible cavitation.

Caries is a multifactorial disease caused by a sticky biofilm which consists of acidogenic bacteria. These bacteria produce acid which demineralizes the enamel of the vulnerable teeth. Researchers in the past 25 years have been claiming proudly that caries prevalence is globally declining but since the last decade, the situation has changed and many studies indicate an alarming increase in caries prevalence in world population [2]. A western European research reveals that initially there was marked reduction in caries in Norway and Iceland but now caries incidence is on the rise in these countries [3]. In a latest study on caries preventive management, authors have cited findings of many studies that show that caries is not only most prevalent human disease but in USA and Australia, it is increasing [4]. A similar situation regarding caries prevalence exists in Pakistan as major cause of tooth loss in Pakistani population is caries [5-7]. In two recently concluded studies on caries prevalence in the country, a study revealed that caries prevalence was found to be 46% among school goers in Sargodha [8] while another study shows caries prevalence in more than 50% children despite their good oral hygiene and regular brushing habit [9].

Considering caries as an irreversible damage of tooth-tissue, it has been traditionally treated by surgical restorative model. Restoration and repair of a damaged tooth to bring it back to normal function is an essential task a dentist performs but assessing, diagnosing and treating the microbial component (the pathogenic biofilm) of the disease is even more important to seize the disease process. Basic aim of CAMBRA is to provide dental practitioners with a protocol for diagnosis, treatment, and prevention of caries, including nonsurgical pathways to repair tooth structure and such a management of caries is termed as medical model of caries management [10]. It requires CRA of the patients and their categorization as low, medium or high caries risk patient [11,12]. For patients with medium or high risk, cavitated lesions are restored with interim therapeutic restorations (ITR) using glass ionomer cement [13]. Non-cavitated smooth surface carious lesions are remineralized using fluoride gel and varnish application [14,15].

Use of fluoride containing tooth paste and mouth washes helps in recharging of glass ionomer used in ITR [16]. Chlorhexidine mouth rinses and varnish is used as therapeutic agent to control Mutans Streptococci [17]. Deep fissures require sealing with fissure sealants [18,19]. Application of Casein Phosphopeptide-Amorphous Calcium Phosphate (CCP-ACP) makes Calcium Phosphate ions available to a demineralized tooth to enhance remineralization [20]. Patients' dietary analysis and adequate counseling on cariogenic and non-cariogenic diet plays vital role in controlling pathogenicity of microbes present in the sticky biofilm [21]. Xylitol is an artificial sweetener which has a proven anti cariogenic action [22]. CAMBRA also suggests assessment of patients' saliva pH, flow rate, buffering capacity and viscosity as all of them in a healthy mouth have a definite role in inhibiting biofilm's negative activity by neutralizing acids produced by acidogenic bacteria [23].

Evidence suggests that CAMBRA protocols are not effectively followed by dentists' fraternity in Pakistan. In a study, done to assess knowledge about treating dental caries and its clinical implementation, 515 dentists from mostly Asian and African countries participated. A considerable number of dentists from Pakistan also took part in it. The study concluded that most of the participating dentists including Pakistani dentists were using traditional approach to treat caries [24]. Another study, done in Saudi Arabia where significant number of Pakistani dentists work revealed the same conclusion [25]. The results of the two studies don't show the clinical practice pattern exclusively for Pakistani dentists. This study therefore, was planned to confirm whether dental clinicians working in various parts of Pakistan follow recommended CAMBRA protocols or use traditional drill - fill technique for management of caries.

Materials and Methods

A self-administered, user-friendly, face and content validated questionnaire was used as a study tool for this observational study having cross-sectional design. The questionnaire consisted of close-ended simple queries regarding clinical practices of the currently recommended CAMBRA protocols for caries management by responding dentists. A 14-item questionnaire was meticulously designed by the research team using dichotomous scale each having options of "Yes" and "No". The questionnaire consisted of queries about dentists' practices of following CAMBRA protocols which included caries risk assessment, placing interim therapeutic restorations, bacterial count assessment, saliva analysis, dietary analysis and counseling.

The questionnaire was pretested among 10 dentists involved in general dental practice in the evening. The internal consistency of the questionnaire was determined by retaking the responses from the same faculty members after an interval of 15 days using Cronbach's alpha test that yielded a value of 0.81 that make the content very well reliable. To keep the anonymity of the respondents, no personal identifying information was collected and the approval for the study was sought from the research committee of the institution.

The sample size of the present study was determined using non-probability sampling technique. 750 survey forms were sent to dentists in three major cities of Pakistan as per our convenience with the request to help in data collection. It was mentioned in bold letters, on the questionnaire that whoever completes and returns it, will be considered as informed consent for "willing to participate" and responses can be returned by hand, by post or by electronic mail before 31st August 2017. The filled out survey forms received during 1st April to 31st August 2017 were included in the study.

The data were entered and analyzed using SPSS version 20 and descriptive statistics were presented as number and frequencies. Chi square test was employed to observe the statistical significance of the difference among responses of dentists in the three cities. A p-value of less than 0.05 was considered significant.

Results

It is clearly evident from the findings of the study that in the three cities, Karachi, Islamabad and Peshawar where the study was conducted, none of CAMBRA protocols for caries management is followed. CRA is performed by merely 49 respondents whereas 555 don't bother to implement this very basic and essential measure (Table: 1). Placement of ITR in cavitated carious lesion to control caries is done hardly by 22 dentists from the lot of 604 (Table: 2). Saliva pH, flow rate, viscosity and buffering capacity is tested by 27 dentists (Table: 3). Dietary analysis and adequate counseling is also not a common practice among the respondents. It is practiced by ignorable number just 24 dentists (Table: 4). Bacterial count is a valuable predictor of caries risk. For high caries risk patients, definitive restorations should be placed only after the mutans streptococci is well under control. This important investigation is neglected by majority of the dentists and accomplished by only 18 dentists (Table: 5).

Table 1: Number and percentages of dentists who perform CRA.

Variables	Yes n (%)	No n (%)	Total
Karachi Dentists	22 (7%)	295 (93%)	317
Islamabad Dentists	14 (10.8%)	116 (89.2%)	130
Peshawar Dentist	13 (8.3%)	144 (91.7%)	157
Total Dentists	49 (8.1%)	555 (91.9%)	604
<i>P</i> -value is 0.40 not significant at $p < .05$			

Table 2: Number and percentages of dentists who place ITR.

Variables	Yes n (%)	No n (%)	Total
Karachi Dentists	9(2.8%)	308 (97.2%)	317
Islamabad Dentists	7 (5.4%)	123 (94.6%)	130
Peshawar Dentist	6 (3.8%)	151 (96.2%)	157
Total Dentists	22 (3.6%)	582 (96.4%)	604
<i>P</i> -value is 0.42 not significant at $p < .05$			

Table 3: Number & percentages of dentists who get salivary analysis.

Variables	Yes n (%)	No n (%)	Total
Karachi Dentists	11(3.5%)	306 (96.5%)	317
Islamabad Dentists	9 (6.9%)	121 (93.1%)	130

Peshawar Dentist	7 (4.5%)	150 (95.5%)	157
Total Dentists	27 (4.5%)	577 (95.5%)	604
<i>P</i> -value is 0.27 not significant at $p < .05$			

Table 4: Number and percentage of dentists who perform patients' Dietary Analysis.

Variables	Yes n (%)	No n (%)	Total
Karachi Dentists	10(3.2%)	307 (96.8%)	317
Islamabad Dentists	7 (5.4%)	123 (94.6%)	130
Peshawar Dentist	7 (4.5%)	150 (95.5%)	157
Total Dentists	24 (4%)	580 (96%)	604
<i>P</i> -value is 0.51 not significant at $p < .05$			

Table 5: Number and percentage of dentists who get patients' oral Bacterial Count done.

Variables	Yes n (%)	No n (%)	Total
Karachi Dentists	7(2.2%)	310 (97.8%)	317
Islamabad Dentists	6 (4.6%)	124 (95.4%)	130
Peshawar Dentist	5 (3.2%)	152 (96.8%)	157
Total Dentists	18 (3%)	586 (97%)	604
<i>P</i> -value is 0.42 not significant at $p < .05$			

Discussion

It is alarming to comprehend that dental fraternity in Pakistan hasn't progressed from its preliminary caries treatment modalities beyond primitive drill-fill technique. CAMBRA is evidence based and methodical treatment modality intended to identify caries risk, seize initiation and avoid the apparently inevitable removal of hard tooth tissues.

CRA is an integral CAMBRA protocol to enable a dentist to classify his patients' caries risk in order to provide individualized caries management. The results of present study show that practicing dentists in Pakistan don't practice this fundamental protocol. Results of an Indian study match with our findings as the Indian study reveals that a very low percentage of practitioners in Jaipur perform CRA [26]. A related study done in Bosnia reveals that the most Bosnian general dental clinicians do not practice preventive caries management [27]. A Saudi Arabia is country where foreign dentists across the globe come to work along with local dentists. According to the finding of a Saudi based study, neither Saudi national nor foreign national dentists working in the kingdom follow CAMBRA protocols [25].

In contrast, many studies show that CRA is a routine procedure followed by the clinicians. One study concluded that 38% of the dentists performed CRA in their clinics in USA [28].

Our findings were unlike the conclusion of the study according to which majority of the dental professionals practiced CRA [29]. Findings of another UK study show that 69% of the dentists practice CRA [30]. The achieved evidence underpins the conclusion of a study that paradigm shift to non-operative caries management has not been universally accepted [31] specially in the Asian subcontinent and developing countries.

The reason behind dentists of subcontinent and developing countries, not practicing CRA may be that in these regions CAMBRA has not been given as much emphasis as should have been. In United States and UK, most dentists follow CRA protocol because they have included it in their undergraduate curricula with essential clinical implementation. In United States, the most dental schools follow CAMBRA based curricula. In 1998, an assessment was done about implementation of CRA based undergraduate programs in US Dental Schools. It disclosed that 81% of the schools were teaching CRA based caries management. In 2009, 11 years later when the similar survey was repeated, results showed that 90% schools had adopted the same philosophy. In UK, compliance in recording CRA was attained within 10-year of implementing risk-based clinical procedures [32]. A study done at Bulgarian university contrarily shows occurrence of dichotomy between didactic learning and actual practices of caries management and emphasizes to integrate a more comprehensive caries prevention program for adults into the dental curriculum of the dental school at that University [33]. Similar situation seems to exist in this country.

There might be some genuine or ungenue reasons for not adopting CAMBRA in practice. It is difficult to switch over from one habit to another. Most dentists are in the habit of utilizing surgical model to treat caries and therefore they resist the change. Some dentists are aware of significance of CAMBRA but they might face difficulty in interpreting CRA data and some dentists don't afford time to record CRA. Another apparent reason for continuing the old paradigm might be monetary interest of the clinician. In many countries, a dentist is only paid if he or she provides surgical intervention for caries and is not paid appropriately detection, assessment, diagnosis and preventive care [34].

The data collected in the present study was merely from three cities of Pakistan which might not be representative of the entire country from statistical point of view. Comprehensive studies including dentist in urban and rural parts of the country are recommended to get more representative data.

Conclusion

Majority of the participating dentists doesn't implement CAMBRA protocols in clinical practices.

Recommendation

1. Studies on impediments faced by dentists to practice CAMBRA strategies should be conducted and in the light of their findings, problems should be resolved.
2. Short courses and seminars should be conducted by professional organizations and dental schools to abreast, emphasize and train and dental practitioners and dental students to manage caries using CAMBRA philosophy.

3. Subject specialists in various teaching institutions should sit together to bring any amendments in the existing dental curriculum to bring it in line with CAMRA philosophy if required and make it mandatory for teachers to clinically train dental students on modern caries management strategies.

Conflict of Interest

There is no conflict of interest and no financial obligation

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