

Knowledge and Awareness towards Dental Management of Post-Cardio-Thoracic Surgery Patients among Dental Students

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Abstract

Background of the Study: Oral health care professionals must be able to identify various cardiac diseases and its associated post-operative dental emergencies to adopt the appropriate measures to treat them efficiently and effectively. A comprehensive dental treatment plan should be constructed keeping in view all the possible complications related to the post-operative cardio-thoracic surgical factors.

Aim: This study was aimed to determine the knowledge, attitude and awareness towards dental treatment and their management following Cardio-thoracic surgeries among the dental students at undergraduate and postgraduate level.

Methodology: A cross sectional survey was conducted using self-administered questionnaires, through Google forms among 100 dental students from Tamil Nadu India. Statistics has been done and results are tabulated.

Results: The overall knowledge towards various cardio-thoracic surgical procedures carried out and their dental management among dental students was only 65% and 45% for postgraduates and interns group respectively.

Conclusion: The present study showed lack of awareness with limited knowledge and attitude towards various cardiac-thoracic surgical procedures carried out and their corresponding dental management among the dental students especially at the undergraduate level. Hence enlightening and educating the students on several post-surgical management phases at the undergraduate level is essential for effective and efficient treatment outcome and increase the quality of life.

Keywords: Awareness, Cardio-thoracic Surgery, Cardiac Pacemaker, Dental Extraction, Oral Health Problems.

Introduction

Cardiovascular disease is one of the most common medically compromised conditions that can be challenging to manage in terms of oral complications, oral rehabilitation with dental treatment and emergency care. Oral health care professionals play a crucial role in managing this state and are believed to have a sound knowledge, attitude and awareness towards medically compromised condition and treating the same [1].

Several authors recommended that if emergency dental procedure must be performed on a patient who has received a CABG (Coronary Artery Bypass Grafting), pacemaker, or stent before the appropriate time (three to six month) interval has elapsed, that patient should be pre-medicated. After the time interval, no premedication is indicated for those procedures since coronary artery bypass graft surgery is not associated with a long-term risk of infection, antibiotic prophylaxis for dental procedures

is not needed in individuals who have undergone such surgeries. Antibiotic prophylaxis is recommended only for patients with conditions such as Cardiac valvulopathy in a cardiac transplant recipient, congenital heart disease, patients with previous infective endocarditis and Prosthetic cardiac valve who are undergoing dental procedures that involve manipulation of gingival tissues or periapical region of teeth, or perforation of the oral mucosa [2,3,4]. Over the years several studies have shown that invasive dental procedures may contribute to the development of infective endocarditis in patients known to present a high incidence of cardiovascular disease and to be at high risk of morbidity and mortality associated with the disease [5].

A multidisciplinary approach while treating medically compromised dental patients is required to reduce complications and to enhance the prognosis. At the same time, the cardio-thoracic surgeon should refer to a dental surgeon preceding any cardiac surgery in view to prevent infection from the Oral and Para-oral region seeding structures within the heart [6]. To the best of our knowledge, there are very few studies initiated with a key emphasis on knowledge about various cardiac surgical procedures carried out and their corresponding dental management among dental students. Hence the present cross-sectional study was performed to determine the knowledge, attitude and awareness towards dental treatment and their management following Cardiac surgeries among the dental students at undergraduate and postgraduate level.

Methodology

This survey was done to evidently assess the knowledge, attitude and awareness of undergraduate and postgraduate dental students about dental treatment and their management following Cardiac surgeries. It was randomly done among the dental students residing in Chennai through Google forms. The links of the Google forms were circulated via social media to reach 100 dental students within a time of 3 weeks. This study was based on self-applied questionnaire composed of 10 questions, the questions were based on students own

perception hence it helps to assess the actual scenario about the knowledge and behaviour of students. The actual purpose behind the study was well-explained to the participants. The questionnaire covered all the important aspects of oral health problems with special emphasis among post-cardiac surgery patients.

Results

Non-probability, convenient sampling technique was employed that yielded information from 100 dental students. The study comprises of 27 male and 73 female participants. Relevant questionnaire was prepared; responses were noted among the selected population group under the study and evaluated for statistical analysis by SPSS software Version 20.0. The level of statistical significance was set at a *P* value less than 0.05. On statistical evaluation it was observed that all 100 samples were valid for the study with Cronbach's alpha reliability score being 0.846 (Significant score). On evaluation, 100 participants were distributed category wise comprising of 50 intern (undergraduate) students followed by 50 postgraduate students. The questions were individually subjected to chi square test. The Overall chi-square statistic is 277.985. The *p*-value is .0001. The result is significant at $p < .05$.

On evaluating the responses about knowledge on various cardiac surgical procedures among the undergraduate and postgraduate dental students it was observed only 76.02% of the total study participants were aware, among which 58.4% were postgraduates. About 33.8% of the study population were familiar about dental problems associated with cardiac pacemakers, 24.6% about CABG (Coronary Artery Bypass Graft) and 41.6% were aware of dental problems associated with heart valve replacement (Stent) procedure (**Figure 1**). On assessing the distribution of responses about knowledge on medications prescribed and their mechanism of action following cardiac surgical procedures it was observed only 46.5% of postgraduates and 31.1% of undergraduates were aware of aspirin given to prevent blood clots (66.4%) followed by beta-blockers (85%) and ACE inhibitors to help lower blood

pressure (57.6%).

On assessing the responses about attitude and awareness on Indications and Contra-indications of various dental procedures following cardiac surgeries it was noted 64.7% of the post-graduates and 52.3% of the under-graduates were aware of the recommended dental procedures, However majority of the study participants (94.3%) prefer referring to physician or cardiac specialist before starting any dental procedures.

On evaluating the responses about knowledge on emergency dental procedures to be followed it was observed 79.4% were aware of role of Local anaesthesia with Vasoconstrictors for extraction procedures (**Figure 2**) and only 43.3% were aware of guidelines for safe dental practice in this high-risk group such as antibiotic prophylaxis for various cardio-thoracic surgeries (**Figure 3**), and 57.36% were aware of dental guidelines for minor dental procedures such as use of hand scalers rather than ultrasonic scalers. No significant differences

in responses were obtained among the study groups when asked about the oral manifestation of patients following cardiac surgeries.

Descriptive statistics were used to summarize the responses to the questionnaire, with the results being presented as frequencies and percentages. Chi-square tests were used to compare between groups, and the level of significance was set at $P \leq 0.05$. In the final analysis, “yes” or correct responses were given a score of 1 and “no” and “maybe” responses were given a score of 0; the scores were summed to obtain the overall scores in each group and they were then converted into percentages for all the questions. These percentages were classified into four levels: ≤ 50 (“poor”), 50-70 (“moderate”), 70- 90 (“good”), and ≥ 90 (“very good”). The overall knowledge towards various cardiac surgical procedures carried out and their dental management among dental students was only 65% and 45% for postgraduates and interns group respectively (**Table 1**).

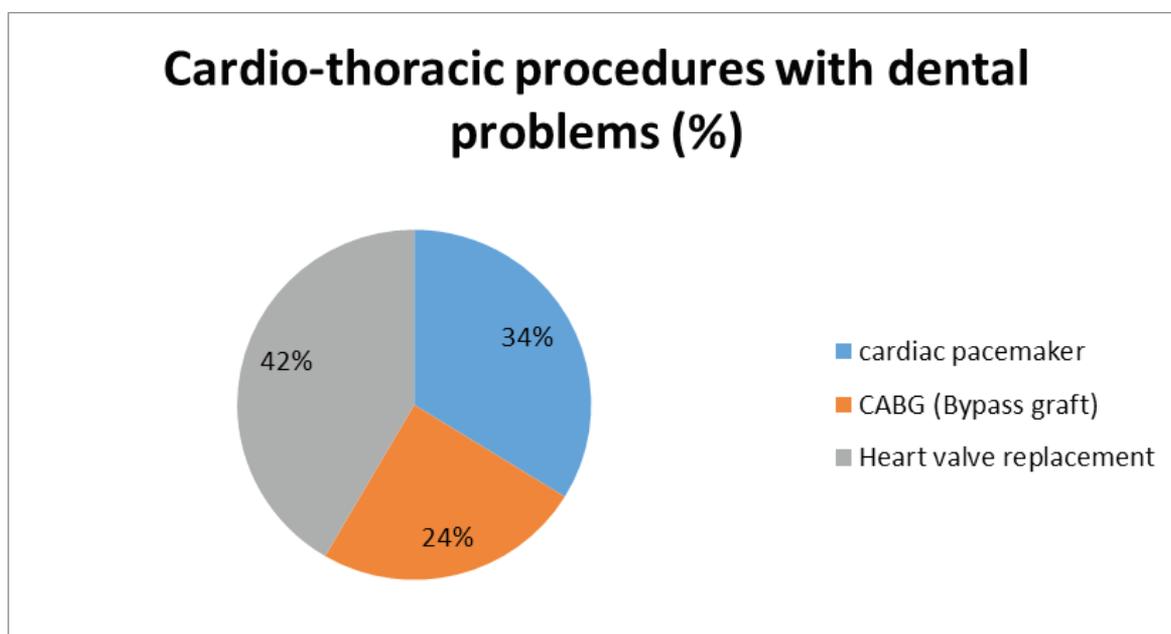


Figure 1: Pie-chart showing responses on knowledge about various cardio-thoracic surgeries with dental problems

Figure 2: Pie-chart showing responses on awareness about use of Vasoconstrictors

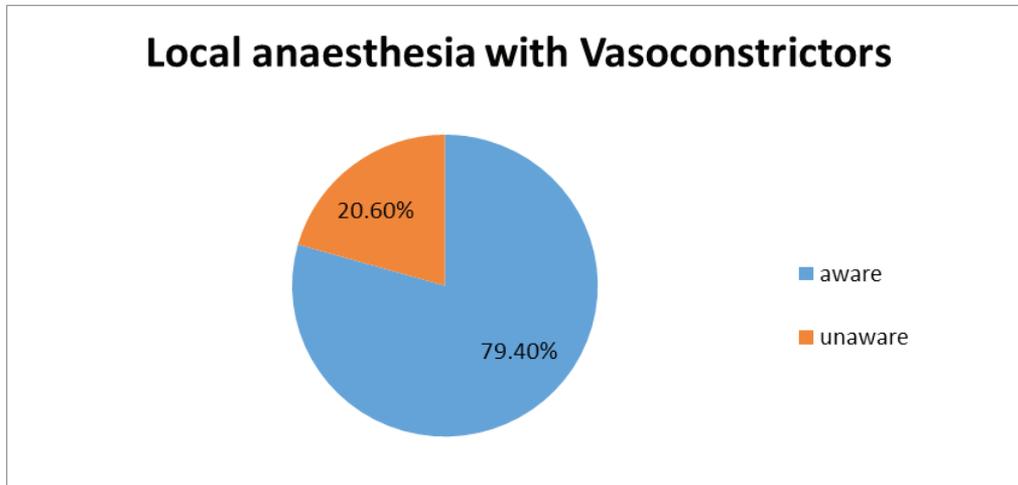


Figure 3: Pie-chart showing responses on awareness about antibiotic prophylactic guidelines for safe dental practice

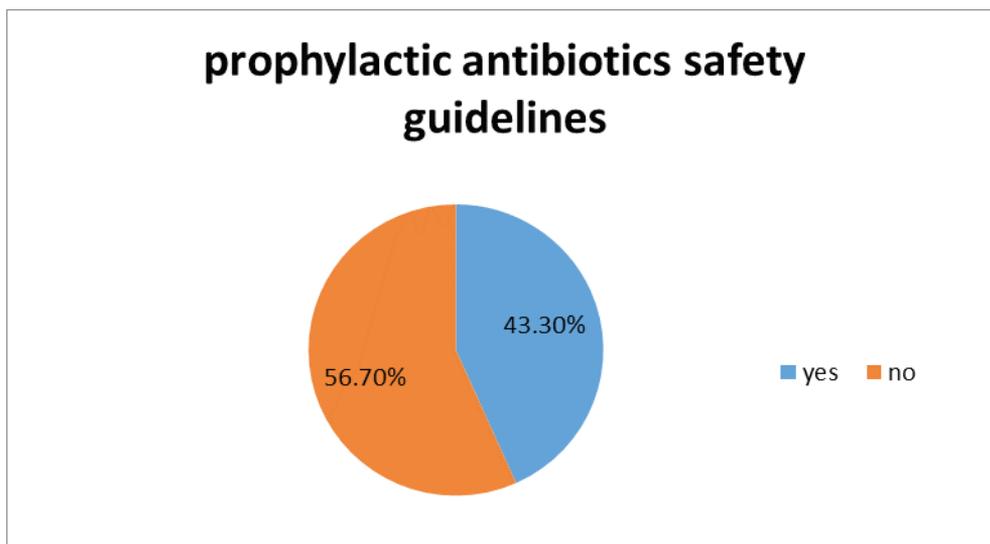


Table 1: Table showing the total score analysis of knowledge about cardiac surgical procedures carried out and their dental management among dental students (%)

OVERALL	Undergraduate (Internship)	postgraduates	X2	P
≤50 (low)	18 (36.0)	8 (16.0)	27.798	<0.0001*
50-70 (average)	27 (54.0)	32 (64.0)		
70-90 (good)	3 (6.0)	7 (14.0)		
≥90 (very good)	2 (4.0)	3 (6.0)		
Total	50 (100.0)	50 (100.0)		
median score	45	65		

(*p<0.05-significant)

Discussion

Patients with cardiovascular disease who had undergone surgeries constitute a high-risk group in dental practice, particularly with a short-span following surgery (Less than six months). It is therefore important for dental surgeons to know their medical condition, cardio-thoracic surgery performed, associated treatments received, dental complication and medicaments, and the possibilities for dental treatment [7]. In the present study on evaluating the responses about knowledge on various cardiac surgical procedures among the undergraduate and postgraduate dental students it was observed only 76.02% of the total study participants were aware, among which 58.4% were postgraduates. About 33.8% of the study population were familiar about dental problems associated with cardiac pacemakers, 24.6% about CABG (Coronary Artery Bypass Graft) and 41.6% were aware of dental problems associated with heart valve replacement (Stent) procedure. Kamath et al [6], Pacaric et al [8], Cruz-Pamplona et al [9] and Cotti et al [10] suggested modified dental treatment and procedural considerations in cardiac disease patients with recent cardio-thoracic surgeries.

On assessing the distribution of responses about knowledge on medications prescribed and their mechanism of action following cardiac surgical procedures it was observed only 46.5% of postgraduates and 31.1% of undergraduates were aware of aspirin given to prevent blood clots (66.4%) followed by beta-blockers (85%) and ACE inhibitors to help lower blood pressure (57.6%). Chaudhry et al [11] similar to our study also recommended the prerequisite of knowledge about several drugs used in treatment of cardiovascular diseases, mechanism of action and the potential adverse effects of drugs.

On assessing the responses about attitude and awareness on Indications and Contra-indications of various dental procedures following cardiac surgeries it was noted 64.7% of the post-graduates and 52.3% of the under-graduates were aware of the recommended dental procedures. Deppe et al [12], Singh et al [13] evaluated

the long-term need for dental treatment and concluded that non-radical dental treatment modes prior to cardiac valve replacement can only be successful over the long-term if adequate postoperative dental care is provided suggesting the need for emergency dental treatment even after surgery however in the present study majority of the study participants (94.3%) lack confidence in treating emergency cases and prefer referring to physician or cardiac specialist before starting any dental procedures.

On evaluating the responses about knowledge on emergency dental procedures to be followed it was observed 79.4% were aware of role of Local anaesthesia with Vasoconstrictors for extraction procedures. However, different studies have shown that no significant increases in arterial pressure are induced by the use of anesthesia with a vasoconstrictor in dental treatments. Silvestre et al [14] observed no significant changes in systolic blood pressure before, during or after dental extractions – the lowest pressures being recorded at the end of the procedure, and the highest at the time of extraction. Laragnoit et al [15] in coincidence with other studies in patients with heart diseases, reported that the administration of 2% lidocaine with epinephrine (1: 100,000) induces no significant changes in the hemodynamic parameters during dental treatment suggesting that its use is safe in minor dental operations, provided a good anesthetic technique is performed and the treatment prescribed by the cardiologist is maintained.

Tubiana et al [16] assessed the relation between invasive dental procedures and infective endocarditis in patients with prosthetic heart valves and concluded proper understanding of the various antibiotic regimes is mandatory for effective dental treatment whereas in the present study only 43.3% were aware of guidelines for safe dental practice in this high-risk group such as antibiotic prophylaxis for various cardio-thoracic surgeries and 57.36% were aware of dental guidelines for minor procedures such as use of hand scalers rather than ultrasonic scalers suggesting lack of awareness and knowledge. In dental practice a minimum safety period of 6 months has been established before any oral surgical

procedure can be carried out. In this time, dental treatment should be limited to emergency procedures aimed at pain relieving extractions, the drainage of abscesses and pulpal therapy preferably carried out in the hospital setting [17]. After this safety period, the treatment decision should be established on the basis of the condition and medical status of each specific patient. Thus a comprehensive dental treatment plan should be constructed keeping in view all the possible complications related to the post-operative cardio-thoracic surgical factors.

Conclusion

The present study showed lack of awareness with limited knowledge and attitude towards various cardio-thoracic surgical procedures carried out and their corresponding dental management among the dental students especially at the undergraduate level. Most of the study participants specified that they would prefer referring to physician before starting any procedures however were unsure and lack confidence to treat in emergency situations. Hence enlightening and educating the students in several post-surgical management phases at the undergraduate level is essential for effective and efficient treatment outcome and increase the quality of life.

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