

KNOWLEDGE, ATTITUDE AND PRACTICES OF DENTAL STUDENTS TOWARD DENTAL MANAGEMENT OF PATIENTS ON ANTIPLATELET THERAPY

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ABSTRACT

Objective: To evaluate the knowledge, attitude and practices of dental students toward dental management of patients on antiplatelet therapy.

Methods: A self-administered questionnaire of 17 questions was administered to 150 students, belonging to third, final year and internship trainee of undergraduate dental program. The questionnaire was designed to collect the data regarding the knowledge of dental students about antiplatelet drugs, their attitude and practices when treating patients on antiplatelet therapy. The data from the participants were collected, statistically analyzed, and results were obtained.

Results: About 80.8% of students have stated that minor surgical procedures cannot be carried out safely, without stopping the antiplatelet medication. 46.7% of students have mentioned that local hemostatic measures can control bleeding in a patient on antiplatelet therapy during dental treatment. 70% of them preferred to refer the patient to physician/cardiologist while treating patients on antiplatelet medications. 78.3% were not aware of the UK medicines information regarding surgical management of the primary care dental patient on antiplatelet medication. 70% of dental students have thought that evidence-based guidelines will be helpful in the dental management of patients on antiplatelet therapy.

Conclusion: Educational programs or workshops related to the subject can increase the awareness of students to update their knowledge and practice related to managing patients on antiplatelet therapy before dental treatment. The findings from this study suggest that there is a great need to educate dental students to use evidence-based guidelines in terms of dental treatment for patients on antiplatelet therapy.

Keywords: Antiplatelet therapy, Survey, Bleeding, Aspirin, Dental extraction.

INTRODUCTION

An ageing society and a continuous expansion of the eligibility criteria for primary or secondary pharmacological prevention of cardiovascular and cerebrovascular events have led to an ongoing rise in the number of patients taking antiplatelet therapy (aspirin). When these patients present for dental procedures, a potentially increased bleeding risk under continued antiplatelet has to be balanced against the risk of thromboembolic events in case the protective drugs are discontinued before the procedure. The standard of care followed by dentists until now is to stop antiplatelet drugs before dental procedures involving bleeding since these drugs are known to affect coagulation and clot formation. Most current recommendations favor the performance of simple procedures such as tooth extraction under continued antiplatelet or anticoagulation therapy [1]. Data in the literature largely indicate that in patients taking aspirin the risk of thromboembolism outweighs the risk of bleeding [2,3]. As a consequence, it is usually not recommended to interrupt therapy with aspirin (antiplatelet drugs) for tooth extractions [4,5]. Dental students were either not aware of the official recommendations or had difficulties in adapting these to clinical practice. Hence, we conducted this structured survey on dental students of our institution to evaluate their knowledge, attitude and practices regarding dental management of patients on antiplatelet therapy.

METHODS

The study was conducted during the academic year January 2016 among the dental students who were attending the third year, final year, and internship (fifth year trainee) of undergraduate program in Saveetha Dental College and Hospital, Saveetha University, Chennai. A self-administered questionnaire of 17 questions was administered to 150 dental students, 50 students from each year. The questionnaire was

designed to collect the data regarding the knowledge of dental students about antiplatelet drugs, their attitude and practices when treating patients on antiplatelet therapy. The data from the participants were collected, statistically analyzed, and results were obtained.

RESULTS

In this study, about 62.5% of dental students knew aspirin is an antiplatelet drug (Fig. 1) and 72.5% of dental students stated that aspirin inhibits platelet aggregation irreversibly (Fig. 2). 59.2% of students answered that clopidogrel is an antiplatelet drug (Fig. 3) and 57.5% of them answered that dipyridamole is also an antiplatelet drug (Fig. 4) and 67.5% of students said that action of dipyridamole is reversible (Fig. 5).

About 62.5% of participants have agreed that continuation of antiplatelet drugs during dental treatment increases significant bleeding (Fig. 6). 70% of them preferred to refer the patient to physician/cardiologist while treating patients on antiplatelet medications (Fig. 7). 35.9% of dental students have said that aspirin has to be stopped 3 days before dental treatment, 30% 5 days prior, 17.5% 7 days prior, 10% 9 days prior, and 6.6% 1 day prior (Fig. 8). 61.7% of students have stated that stopping or discontinuing antiplatelet drug can cause thromboembolism (myocardial infarction and stroke) (Fig. 9).

Around 80.8% of students have stated that minor surgical procedures cannot be carried out safely, without stopping the antiplatelet medication (Fig. 10). 46.7% of students have mentioned that local hemostatic measures can control bleeding in a patient on antiplatelet therapy during dental treatment (Fig. 11). 63.3% of them have told that non-steroidal anti-inflammatory drugs (NSAIDs) group of drugs will interact with antiplatelet drug (Fig. 12). Exactly 56.7% of participants

have answered that warfarin is an anti-coagulant (Fig. 13). 70% of dental students have thought that evidence-based guidelines will be helpful in the dental management of patients on antiplatelet therapy (Fig. 14). 42.5% of students have preferred not to wait until antiplatelet treatment is completed before performing a dental procedure (Fig. 15). 78.3% were not aware of the UK medicines information regarding surgical management of the primary care dental patient on antiplatelet

medication (Fig. 16). 82.5% of dental students have told that patients taking antiplatelet dual therapy (aspirin + clopidogrel) should be treated very cautiously after consulting with the physician/cardiologist (Fig. 17).

In the following figures X-axis denotes options for the questions, Y-axis denotes percentage of students answered.

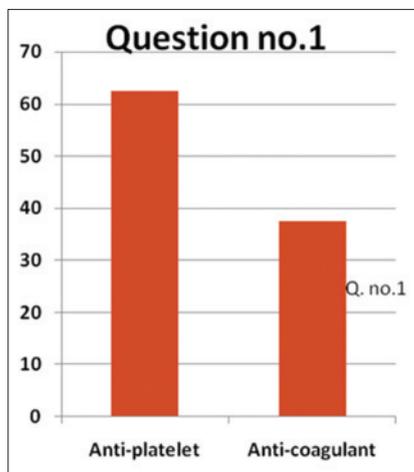


Fig. 1: Action of aspirin

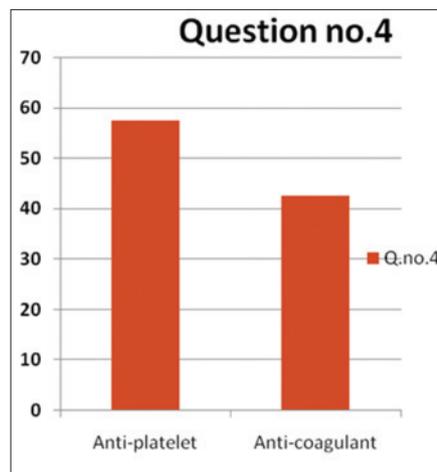


Fig. 4: Action of dipyridamole

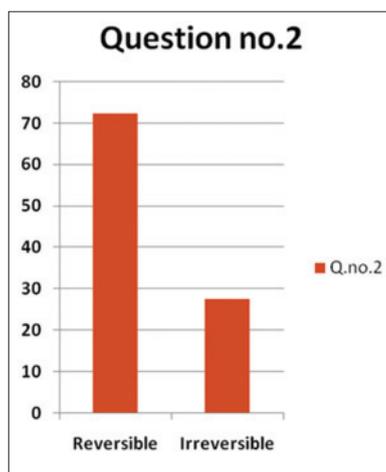


Fig. 2: Action of aspirin on platelets

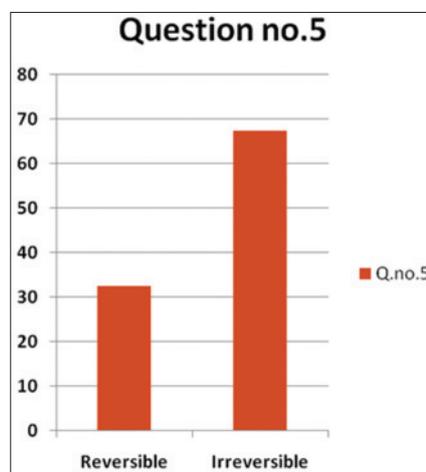


Fig. 5: Action of dipyridamole on platelets

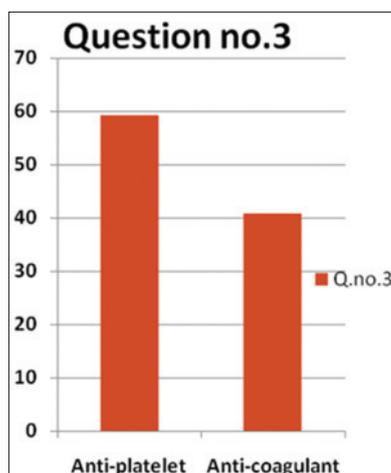


Fig. 3: Action of clopidogrel

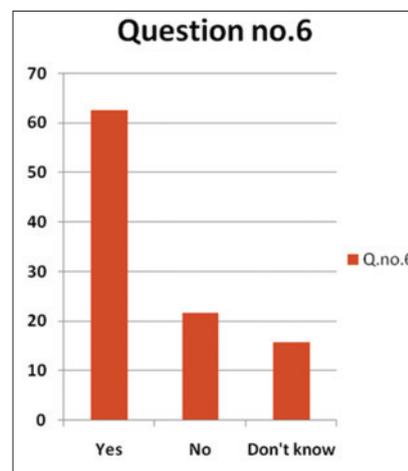


Fig. 6: Dental treatment during antiplatelet therapy causes bleeding

DISCUSSION

Antiplatelet agents are widely used in prevention and treatment of various ischemic cardiovascular and cerebrovascular conditions [6] and the common indications for their long-term use are arterial thrombosis, ischemic heart disease, myocardial infarction, both stable and unstable angina, coronary artery bypass and placement of a stent, non-hemorrhagic stroke, transient ischemic attacks (ischemic stroke), peripheral arterial

disease, atrial fibrillation. The most commonly used antiplatelet drugs include aspirin and clopidogrel. Patients who are on antiplatelet therapy and undergoing oral surgical procedures may be at risk of bleeding. Growing number of evidence suggests that stopping antiplatelet therapy before dental procedure may increase risk of thromboembolic events [7,8]. Different guidelines regarding how to manage such patients before surgical interventions have been proposed in the literature [9,10].

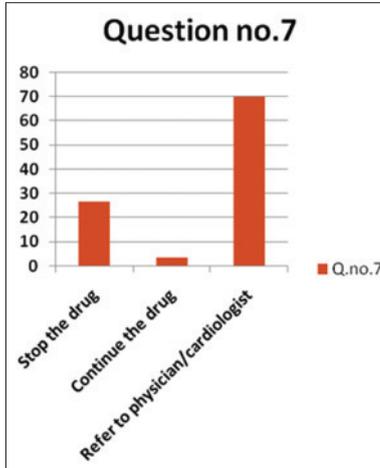


Fig. 7: Decision regarding antiplatelet therapy

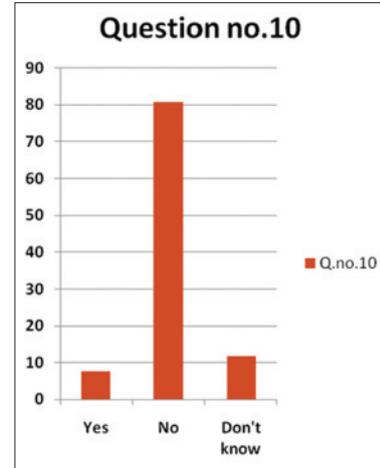


Fig. 10: Safety of performing minor surgery during antiplatelet therapy

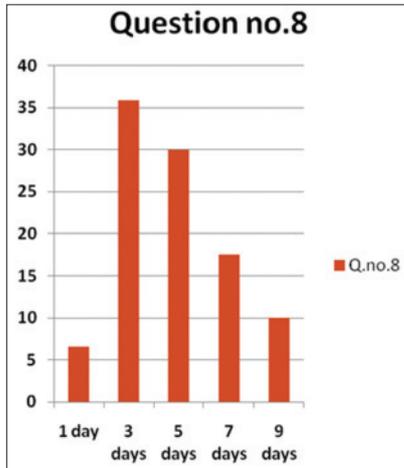


Fig. 8: Duration of stoppage of aspirin before dental treatment

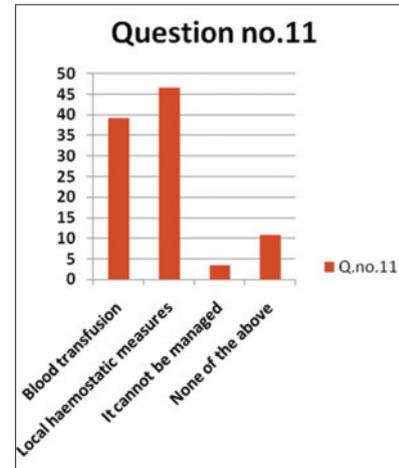


Fig. 11: Management of bleeding

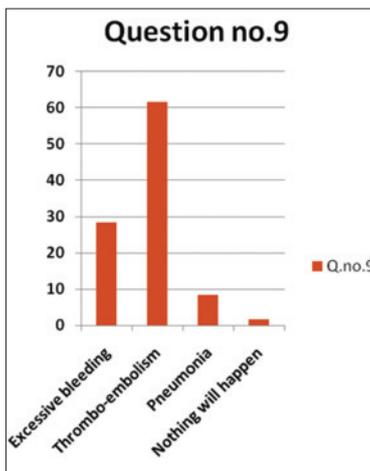


Fig. 9: Effect of discontinuing antiplatelet drugs

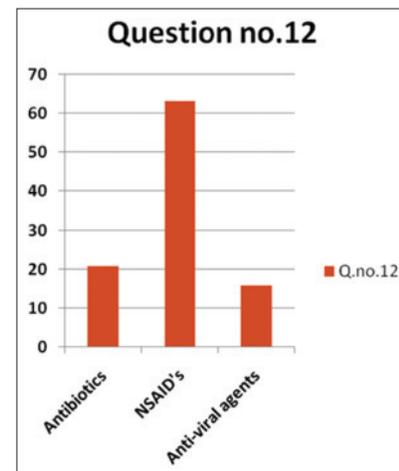


Fig. 12: Drug interactions of antiplatelets

The 9th edition of the American College of Chest Physicians' Evidence-based Clinical Practice Guideline (2012) advises practitioners not to adjust any oral antithrombotic medications before or during most dental procedures [11,12]. It recommends continuing the antiplatelet drugs perioperatively in patients who require operation within 6 weeks of placement of a metal stent or within 6 months of placement of a drug-eluting stent. Acute myocardial infarction has followed in such

patients after withdrawal of antiplatelet therapy. The American Heart Association, American College of Cardiology, Society for Cardiovascular Angiography and Interventions, American College of Physicians, American College of Surgeons, American Dental Association, National Health Service, and numerous authors recommend either maintaining double antiplatelet therapy in dental interventions and applying the necessary local hemostatic measures to control the hemorrhage or delaying the intervention until the dual therapy can be withdrawn without risk [11,13]. Despite the availability of these guidelines, the management of dental patients receiving antiplatelet therapy is still not well known and is improperly followed.

In our study, most of them (62.5%) knew about antiplatelet drugs and their mechanism of action (72%). Most of them (62.5%) were aware that continuation of aspirin causes significant bleeding during oral surgical procedures 61.7% of students were also aware of thromboembolic complications that can occur on discontinuing antiplatelet therapy.

In our study, majority believed that minor surgical procedures cannot be carried out safely, without stopping the antiplatelet medication and opinion regarding stoppage of aspirin varied and most of them would like to stop the drug either 3 days or 5 days before the oral surgical procedures. The majority of students consulted the physician or cardiologist regarding stoppage of antiplatelets while treating patients on dual antiplatelet regimen. This is in accordance with the study by Ringel and Maas [14] who investigated how German dentists adhered to recommendations regarding dental treatment of patients taking antiplatelet or oral anticoagulation therapy for cardiovascular protection. It was found before dental procedures, such as simple tooth extractions, antiplatelet therapy, and especially oral anticoagulants, are still more frequently discontinued than clinically recommended and the decision to discontinue the protective medication is mostly taken in consultation with the general practitioner or specialist of the patients. When they prescribed ibuprofen for pain relief, they did not consider

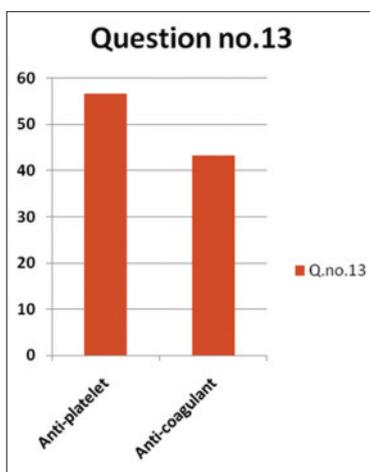


Fig. 13: Action of warfarin

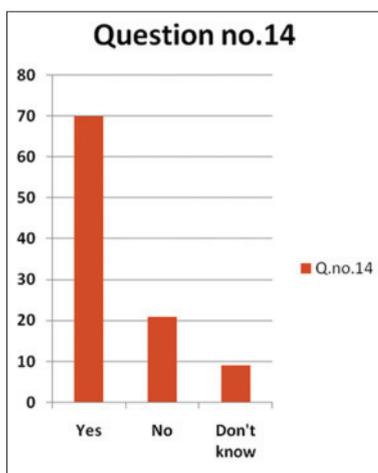


Fig. 14: Need of evidence based guidelines for management

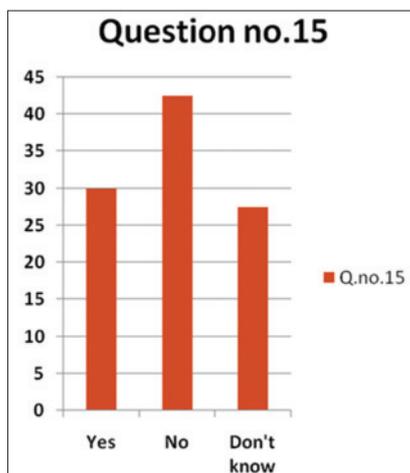


Fig. 15: Defer dental treatment during antiplatelet therapy

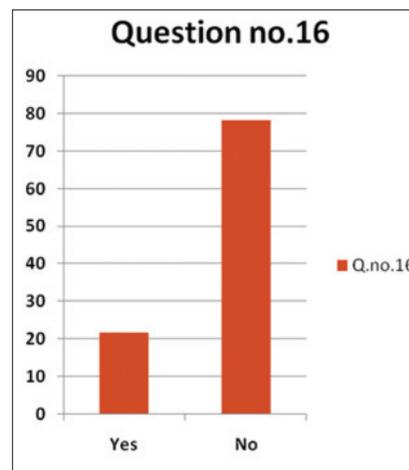


Fig. 16: Awareness of UK medicines information [NHS] guidelines

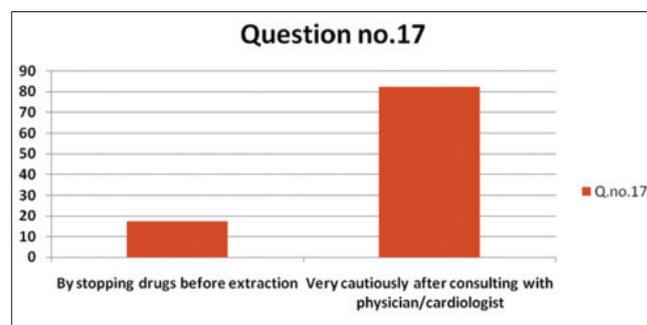


Fig. 17: Management of patients on dual antiplatelet therapy

the drug interactions between aspirin and brufen. However, fair percent of dental students (63.3%) in our study had knowledge about drug interactions between aspirin and NSAID's.

The majority (78.3%) were not aware of UK medicines information regarding surgical management of the primary care dental patient on antiplatelet medication, but all of them thought that evidence-based guidelines will be helpful in management. This is in accordance with the study by Shah *et al.* [15] in which they evaluated the knowledge of medical and dental practitioners toward the dental management of patients who are on anticoagulant and/or antiplatelet agents and concluded dentists and medical practitioners showed a wide range of different approaches in terms of knowledge related to management of patient taking anticoagulant and/or antiplatelet medication before dental treatment and emphasizes the need to educate both medical and dental practitioners to use evidence-based guidelines for management of such patients.

van Diermen *et al.* [16] conducted a survey to evaluate the management strategies of Dutch oral and maxillofacial surgeons when performing invasive dental or oral surgery in patients using oral antithrombotic medication. The oral and maxillofacial surgeons felt a need for a clinical practice guideline on the surgical management of patients using oral antithrombotic medications. It was also found that oral surgeons significantly alter their treatment strategies when performing major procedures in patients using oral antithrombotic medications. Students in our study also thought that evidence-based guidelines will be helpful in management.

Vast majority said that they wait for the antiplatelet therapy to get completed before performing a dental procedure, probably because they were worried about bleeding complications during oral surgical procedures and only 46.7% of students believed that local hemostatic measures can control bleeding.

In a study by Can *et al.* [17] from their study conclude that knowledge about coronary stents, associated clinical outcomes, and current guidelines, with regard to surgical management of antecedent antiplatelet therapy in Central Eastern Turkey practicing dentists to be inconsistent, and heavily dependent on the location of dental practice and emphasize on the focus of continuous medical education to improve the quality of medical care. Similarly, in our study, although students' knowledge about antiplatelet drugs is acceptable, their knowledge about treatment guidelines for dental patient on antiplatelet therapy is insufficient and hence practical application is negligible. Hence, continuing medical education on this topic is very essential for the students and practicing dentists to update their knowledge.

Evidence based dental practice guidelines

Review of recent literature on dental management of patients on antiplatelet therapy

Bajkin *et al.* [18] in their study concluded that patients taking single or dual antiplatelet drugs may have teeth extracted safely without interruption of treatment using only local hemostatic measures to control post-operative bleeding. Verma *et al.* [19] in their prospective study concluded that there is no need to stop the antiplatelet dose of aspirin before simple tooth extraction as there was 0% incidence of post-operative bleeding in their patients. Olmos-Carrasco *et al.* [20], in their prospective study on 181 patients who underwent dental extractions observed regarding hemorrhagic complications, concluded the safety of dental extraction without withdrawal of double antiplatelet therapy.

Girotra *et al.* [21] from their prospective study conclude that there was no necessity to stop antiplatelet therapy and higher levels of bleeding measures are necessary in patients with dual antiplatelet therapy. According to a study by Hanken *et al.* [22] continued aspirin therapy in patients undergoing dental osteotomies has no effect on the incidence of post-operative bleeding and should not be interrupted. Nooh [23] in his study concluded that subjects who received 81 mg

ASA daily could undergo dental extraction without bleeding risks. van Diermen *et al.* [24] in their literature review suggest not to interrupt oral antithrombotic medication, not even dual antiplatelet therapy, in simple dental procedures. Broekema *et al.* [25] from their prospective study concluded that dentoalveolar surgery is safe in patients being treated with anticoagulants.

Many other studies have recommended that dental extractions can be carried out safely without discontinuation of antiplatelet therapy [5,4,26-32]. Bingjie Zhao *et al.* [33] from their meta-analysis stated that they could not conclude that bleeding time or the extent of hemorrhage in dental extraction are prolonged when patients are on long-term aspirin therapy and recommend not to stop antiplatelet drugs before tooth extraction and that the hemostasis method be enhanced. Napeñas *et al.* [34] conducted a retrospective analysis to evaluate the risk of bleeding complications in patients on single or dual antiplatelet therapy undergoing invasive oral surgical procedures including dental extractions. They concluded that risk of stopping antiplatelet therapy and predisposing the patient to thromboembolic events far outweighed the negligible risk of bleeding from dental procedures. Lillis *et al.* performed a prospective study to compare the incidence of bleeding complications among patients taking aspirin monotherapy, clopidogrel monotherapy, and dual therapy with both aspirin and clopidogrel and patients not taking aspirin at all. The results showed that greater number of patients on dual antiplatelet therapy showed prolonged immediate bleeding when compared to control healthy patient group and the difference was statistically significant. Although there is greater incidence of prolonged immediate bleeding in dual antiplatelet therapy group, hemostasis was achieved easily by local hemostatic measures. Therefore, they concluded that the patient should not be predisposed to risk of thromboembolism by stopping either antiplatelet monotherapy or dual therapy [35].

SUMMARY

From the updated evidence based - literature review, the current recommendations are that antiplatelet monotherapy or even antiplatelet dual therapy need not be altered or stopped before minor oral surgical procedures. Most of the post-operative bleeding can be easily controlled by local hemostatic measures. The risk of hemorrhage after dental surgery may be greatly outweighed by the risk of thromboembolism after withdrawal of anti-thrombotic therapy.

CONCLUSION

In this study, a small percentage of dental students were aware of proper guidelines and were following them. Such hesitation in following guidelines shows that the management of dental patients on antiplatelet therapy still needs more clarification for students. One of the reasons may be, to follow a routine method of practice rather than an evidence based health care practice. Educational programs or workshops related to the subject can increase the awareness of students to update their knowledge and practice related to managing patients on antiplatelet therapy before dental treatment [36]. The findings from current study suggests that there is a great need to educate dental students to use evidence based guidelines in terms of dental treatment for patients on antiplatelet therapy.

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Annexure 1: Questionnaire

1. Aspirin is
 - a. Antiplatelet
 - b. Anti-coagulant
2. Aspirin inhibits platelet aggregation which is
 - a. Reversible
 - b. Irreversible
3. Clopidogrel is
 - a. Antiplatelet
 - b. Anti-coagulant
4. Dipyridamole is
 - a. Antiplatelet
 - b. Anti-coagulant
5. The action of dipyridamole is
 - a. Reversible
 - b. Irreversible
6. Continuation of antiplatelet drugs during dental treatment increases significant bleeding?
 - a. Yes
 - b. No
 - c. Don't know
7. What will you do while treating a patient taking an antiplatelet drug?
 - a. Stop the drug
 - b. Continue the drug
 - c. Refer to the physician/cardiologist
8. If aspirin is to be stopped, how many days before dental treatment it should be done?
 - a. 1 day
 - b. 3 days
 - c. 5 days
 - d. 7 days
 - e. 9 days
9. Stopping/discontinuing antiplatelet drugs can cause
 - a. Excessive bleeding
 - b. Thromboembolism (myocardial infarction and stroke)
 - c. Pneumonia
 - d. Nothing will happen
10. Minor surgical procedure can be carried out safely, without stopping the antiplatelet medications?
 - a. Yes
 - b. No
 - c. Don't know
11. How bleeding can be controlled in a patient on antiplatelet therapy, during dental treatment?
 - a. Blood transfusion
 - b. Local hemostatic measures
 - c. It cannot be managed
 - d. None of the above
12. Which of the following group of drugs will interact with antiplatelet drugs?
 - a. Antibiotics
 - b. NSAID's
 - c. Anti-viral agents
13. Warfarin is
 - a. Antiplatelet
 - b. Anti-coagulant
14. Do you think evidence based guidelines will be helpful in dental management of patients on antiplatelet therapy?
 - a. Yes
 - b. No
 - c. Don't know
15. Do you prefer to wait until antiplatelet treatment is completed, before performing a dental procedure?
 - a. Yes
 - b. No
 - c. Don't know
16. Are you aware of UK medicines information (NHs) regarding surgical management of the primary care dental patient on antiplatelet medication?
 - a. Yes
 - b. No
17. Patients taking antiplatelet dual therapy (aspirin + clopidogrel) should be treated
 - a. By stopping drugs before extraction
 - b. Very cautiously after consulting with the physician/cardiologist