

# Dentists' Knowledge, Attitude and Practice in Treating Patients Taking Oral Antithrombotic Medications – A Survey

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## ABSTRACT

**Introduction:** India lists high on patients suffering from diabetes, hypertension, stroke and myocardial infarction. Hence, a large proportion of the population is on long term Oral Antithrombotic Medications (OAM). Though several guidelines exist on dental management of these patients, previous surveys have shown variation among the dentists.

**Aim:** The purpose of this study was to assess the knowledge, attitude and practice of dentists in Chennai, India, towards dental management of patients taking OAM using a questionnaire survey.

**Materials and Methods:** The survey was conducted among 256 dentists in Chennai, India using a printed questionnaire containing 16 questions, at their university location. Descriptive statistical analysis was used to analyze the data.

**Results:** Of the final population of dentists who were included in the survey (n =212), majority of them were aware about drugs such as warfarin and aspirin compared to other newer drugs (dabigatran, rivaroxaban). Most participants took physician's opinion before proceeding with any invasive dental procedure and thromboembolic events were their major concern while treating patients on OAM.

**Conclusion:** The survey revealed dentists are knowledgeable about management of patients on OAM. However, they tend to overestimate the bleeding risk, thus being cautious in their treatment approach. Based on the results of the study, the authors suggest that continuing dental education programs and further training on management of such medically complex patients will be beneficial in order to provide optimum dental care to people taking OAM.

**Keywords:** Anticoagulants, Antithrombotic agents, Questionnaires

## INTRODUCTION

Dentists commonly come across people suffering from chronic illnesses [1]. These patients are often on long-term medications such as oral antithrombotics which includes both anti-platelets and anti-coagulants. These medications have important implications when performing a dental procedure. OAMs are prescribed as primary or secondary prophylaxis for commonly encountered illnesses such as diabetes, hypertension, ischemic heart disease and cerebrovascular disease. The Indian subcontinent has high prevalence of coronary artery disease [2], cerebrovascular disease, diabetes mellitus [3] and hypertension [4]. The number of new cases of cerebrovascular accidents in India has been rapidly increasing over the past few decades [5,6]. Hence, large subsets of the Indian population are on OAMs.

Historically, the OAMs were discontinued to reduce the risk of bleeding during any invasive dental procedure [7]. In recent times the risk of thromboembolism has gained an upper hand, based on which several protocols have been recommended for management of these patients undergoing dental procedures [8–10]. However, it could be noted that a varied practice exists among the dentists when treating these patients in spite of several existing protocols, as was outlined in several surveys around the world [11–15]. A large section of patients seeking dental treatment in India are on long term and often lifelong OAMs. Hence, the aim of the current study was to assess the attitude, knowledge, and practice of dentists in Chennai, India, towards the management of patients on OAM using a questionnaire.

## MATERIALS AND METHODS

A semi-structured questionnaire consisting of 16 questions was formulated for the purpose of this survey. The questionnaire was formulated by the authors of the study. The questionnaire had both closed and open-ended questions. It focused on the dentists'

knowledge, their attitude towards the management of patients on OAM and their peri-procedural practice with regard to the dental treatment of such patients. Some questions had multiple answers possible, which was stated in the question. A panel of three Oral and Maxillofacial Surgeons, a Cardiologist and a Neurologist were consulted to establish the face and content validity of the questionnaire. A pilot study was conducted amongst 100 faculty members of the university. After the pilot survey the questionnaire was modified based on the advice of experts from the field of Oral Maxillofacial Surgery and Community Medicine. Consensus method was followed to assess the reliability of the questionnaire [16].

The target population was dentists working in a university hospital (with a minimum qualification of Bachelor of Dental Surgery) who were actively involved in teaching and practice of dentistry. Six universities were randomly chosen from the online database of the Dental Council of India (DCI) [17] among dental colleges in Chennai, Tamil Nadu, India. The dentists in these universities were approached to complete a printed questionnaire. The questionnaires were distributed in person to the faculty dentists at their university location by two nurses. Participation was completely voluntary. The participants had the liberty to quit from the survey at any stage. The nurse distributed the questionnaire and ensured that the participant filled it in front of them in their own handwriting. The nurse did not provide any clarification or clear any doubts of the participants. The completed questionnaires were safely collected and preserved for future analysis. No incentives or compensation was offered to the participants for completing the survey. The study was approved by the ethics committee of the university.

## STATISTICAL ANALYSIS

A total of 256 participants were given the questionnaire. Non-respondents (N=11), which included partially filled questionnaires (<12 questions answered) were excluded from the survey.

Questions	Options	N(%)
How many years have you been practising dentistry?	1-5 years	61(28.7%)
	6-10 years	56(26.4%)
	11-20 years	76(35.8%)
	>20 years	19(8.9%)
Do you come across patients under oral antithrombotic medications such as clopidogrel/warfarin in your dental practice?	Yes	212(100%)
	No	0(0%)
If yes, how often do you consult on a patient on oral antithrombotic medications?	Daily	17(8.0%)
	Weekly	55(25.9%)
	Monthly	81(38.2%)
	Couple of times/year	59(27.8%)
Where have you been practising dentistry? (Multiple answers possible)	Private clinic	165(77.8%)
	University hospital	131(61.8%)
	Government hospital	31(14.6%)
	Corporate hospital	33(15.6%)

**[Table/Fig-1]:** Dentists response for questions regarding their experience.

Participants with no experience in treating patients taking OAM (N=33) (specialists who did not encounter patients taking OAM in their dental practice) were also excluded from the survey. Hence, a total of 44 participants were excluded and the final number of samples considered for analysis was 212. Descriptive statistical analysis was used to report the responses. Statistical software (SPSS for Windows, version 16.0, IBM SPSS, Armonk, N.Y.) was used to analyze the data collected.

## RESULTS

All the surveyed dentists were faculty members in the dental colleges. Majority of the study population (38.2%) encountered patients taking OAM, at least once in a month [Table/Fig-1]. Apart from working in the university, 77.8% of them had a private practice, 14.6% worked in a government hospital and 15.6% worked in corporate hospitals. The mean practice experience of the participants was 23 years (range 2-45 years) [Table/Fig-1].

Most participants were well aware of drugs such as clopidogrel (83.4%) and warfarin (43.4%). Newer drugs such as dabigatran, apixaban and rivaroxaban were known to only a few dentists (7.1%). When asked about the conditions for which OAM are usually prescribed, 78.3% of the dentists answered as cardiac conditions (coronary artery disease, myocardial infarction, angina and atrial fibrillation), followed by stroke and cerebrovascular accidents (30.2%) [Table/Fig-1].

When questioned whether they ask for any blood investigations during their routine investigations of such patients, 72.6% of the participants stated yes. Of this 72.6% of dentists, 45.8% of them asked for blood investigations such as, Clotting Time (CT), Bleeding Time (BT) and 47.2% for International Normalized Ratio (INR) activated Partial Thromboplastin Time (aPTT) and Prothrombin Time (PT), and 16.5% of the participants asked for a complete blood count.

Regarding the management of patients on OAM during various dental procedures, over half of the participants (50.9%) said that they carry out the dental procedure if the blood investigations were within therapeutic limits. Less than half of the survey population (46.7%) said that they will not do the dental procedure even if the blood investigations were within therapeutic limits. Dentists were asked for what dental procedures they would like to stop OAM and five options were given. The participants were allowed to choose multiple answers for this question. A large population of surveyed dentists (96.2%) chose to stop OAM for surgical procedures such as periodontal therapy, implants, impaction surgery and multiple teeth extractions (greater than three teeth per visit). Other options chosen were the extraction of less than three teeth per visit (76.4%), sub

gingival scaling (58.5%) and endodontic procedures (25%). Nearly 1.4% chose none of the above and one participant did not answer this question.

The question pertaining to the factors to be considered in the

Student	Options	N(%)
What are the prescribed OAM that you are aware of? (Multiple answers possible)	Aspirin/clopidogrel	177(83.4%)
	Warfarin/coumarin	92(43.4%)
	Heparin	25(11.8%)
	Others	15(7.1%)
What conditions do you think OAM are usually prescribed for? (Multiple answers possible)	Cardiovascular diseases	166(78.3%)
	Any major surgery	42(19.8%)
	For primary prophylaxis	64(30.2%)
	Cerebrovascular disorders	64(30.2%)
	Others	29(13.7%)
Do you routinely ask for blood investigations during your overall workup of patients on OAM?	Yes	154(72.6%)
	No	54(25.5%)
	Did not answer	4(1.9%)
If yes, please specify the investigations you recommend. (Multiple answers possible)	Bleeding time/clotting time	97(45.8%)
	Prothrombin time/Activated partial thromboplastin time/International normalized ratio (INR)	100(47.2%)
	Complete blood count	35(16.5%)
	Others	9(4.2%)
Irrespective of the OAM taken by the patient, will you carry out the dental procedure if the blood investigations are within therapeutic limits?	Yes	108(50.9%)
	No	99(46.7%)
	Did not answer	5(2.4%)
For patients on OAM, whose opinion do you seek before carrying out the dental procedure? (Multiple answers possible)	Not applicable (I do not consult anyone)	1(0.5%)
	Any medical practitioner	20(9.4%)
	Primary physician of the patient	177(83.5%)
	Colleague	6(2.8%)
	Others	7(3.3%)
For what procedures would you like to stop the OAM? (Multiple answers possible)	Surgical procedures (periodontal, implants, impaction, multiple teeth extraction (>three teeth/visit)	204(96.2%)
	Extraction (<three teeth/visit)	162(76.4%)
	Endodontic procedures	53(25%)
	Subgingival scaling	124(58.5%)
	None of the above	3(1.4%)
Which factors would you like to consider in your management of patients on OAM? (Multiple answers possible)	Disease of the patient for which it was prescribed	152(71.7%)
	Invasiveness of the dental procedure	171(80.7%)
	Prior experience with this patient	82(38.7%)
	Results of the investigations carried out	106(50%)
	Others	3(1.4%)
	What would you do if a non-invasive dental procedure (eg., restoration) is required for patients on OAM?	Deny treatment
Refer the patient for an opinion prior to the procedure		45(21.2%)
Stop the drug on your own and continue with the procedure		4(1.9%)
Proceed with the necessary treatment without stopping the drug		160 (75.5%)
Did not answer		1(0.5%)

Student	Options	N(%)
What would you do if an invasive dental procedure (procedures where bleeding is likely to be encountered) is required for patients on OAM?	Deny treatment	0
	Refer the patient for an opinion prior to the procedure	197(92.9%)
	Stop the drug on your own and continue with the procedure	7(3.3%)
	Proceed with the necessary treatment without stopping the drug	6(2.8%)
	Did not answer	2(0.94%)
Number the following factors in ascending order of concern while performing invasive dental procedures (where bleeding is likely to be encountered) on patients under OAM? [(1) being least and (3) being maximum] intra-operative bleeding risk; post-operative bleeding risk; risk of thromboembolic events (stroke, myocardial infarction, etc.)	'A' is of maximum concern and 'C' is of least concern	72(34%)
	'A' is of maximum concern	61(28.7%)
	'B' is of maximum concern	55(25.9%)
	'C' is of maximum concern	92(43.4%)
Do you feel the need for a practice guideline: "Management of dental/oral surgical treatment in patients on OAM" in an Indian scenario?	Yes	197(92.9%)
	No	10(4.7%)
	No opinion	4(1.9%)
	Did not answer	1(0.5%)
Would you like to be a part of studies pertaining to this topic in the future?	Yes	173(81.6%)
	No	34(16%)
	Did not answer	5(2.4%)

**[Table/Fig-2]:** Dentists response for questions regarding their knowledge, attitude and practice of managing patients on OAM.

management of such patients had five options and it was stated in the question that multiple answers were possible. The majority of the participants (80.7%) stated that invasiveness of the dental procedure was the most important factor they consider in the management of such patients. Disease of the patient for which OAM was prescribed was the next common factor considered (71.7%). Results of the investigations carried out such as blood investigations (50%) and prior experience in providing dental treatment to the same patient (38.7%) were the other factors considered by the dentists [Table/Fig-2].

In question number 14, the dentists were asked to arrange three factors such as intraoperative bleeding risk, postoperative bleeding risk and thromboembolic events in ascending order of concern while doing any invasive dental procedure on patients being treated with OAM. One-third of the population (34%) ordered the maximum concern when treating a patient on OAM was the risk of thromboembolic events (stroke, myocardial infarction) followed by post-operative bleeding risk and finally intraoperative bleeding [Table/Fig-2]. Analyzing all responses it was noted that 28.7% and 25.9% of the participants believed that their maximum concern was postoperative bleeding and intraoperative bleeding respectively. Also, 43.4% stated their maximum concern as thromboembolic events.

About 92.9% of the dentists who took the survey felt that there is a necessity to have a practice guideline on "Management of patients on OAM requiring dental treatment in an Indian scenario" and 81.6% of dentists were willing to be a part of studies pertaining to this topic in the future [Table/Fig-2].

## DISCUSSION

A dentists' attitude, knowledge and practice can be determined in an effective manner by conducting a questionnaire survey. Face to face surveys have response rates higher than electronic or mailed questionnaires [18,19]. But the major disadvantage with face to face questionnaires is interviewer bias [20]. Hence, a nurse was present

during the filling up of the printed questionnaire provided to the participants. This was done to ensure better response rate and also eliminated interviewer bias as they did not offer any clarifications.

In the present survey, a little more than half the dentist's answered that they are comfortable with carrying out dental procedures if blood investigations were within therapeutic limits for patients on OAM. However, the same participants answered that they would prefer that the OAM be discontinued prior to procedures such as extraction and implant surgery for which current recommendations suggest proceeding without discontinuing the OAM and manage the bleeding with local haemostatic [21,22].

A systematic review done by Modrid C et al. [23], concluded that there is no need to interrupt anticoagulation therapy or supplement it with bridging therapy for minor procedures like extraction or implant placement. In these cases, local haemostatic measures such as sutures or tranexamic acid solution can be employed to control the bleeding. However, for patients taking oral anticoagulant therapy requiring major oral surgical procedure, where bleeding risk is high, the dosage of anticoagulant therapy can be reduced or the drug can be stopped and bridged with low molecular weight heparin. The decision depends on the individuals risk for thromboembolism and bleeding [23].

The results of survey also suggested that over 40% of the dentists were most concerned about the risk of thromboembolism in the management of these patients. These results could be explained on the basis that though the dentists are aware and updated about the current recommendations, they find it difficult to translate it into practice. This could be in part due to the fact that procedures such as implant surgery are increasingly being carried out by general dentists whose training in the management of excess bleeding could be limited making them apprehensive towards such situations [24]. Thus, they tend to refer the patient to the physician [Table/Fig-2], to reduce the risk of peri-operative bleeding, by requesting them to consider discontinuation of the OAM prior to the procedure. There is a need to transfer the knowledge of the recommendations and the results of these surveys to the physicians, cardiologists and neurologists alike that many of the dental procedures don't result in significant bleeding and don't warrant the discontinuation of the drug [24]. The risk of thromboembolism also has to be reiterated by these primary physicians to the dentist to help them reconsider whether it really requires discontinuation. A similar speculation was made by Ringel R and Maas R [15] about the underestimation of the risk of thromboembolism by dentists and overestimation of the risk of bleeding by the primary physician [15].

Continuing education programs in specialties such as implantology, oral surgery, and periodontics need to include local haemostatic measures and the relevant recommendations as a part of their curriculum. It would also be beneficial if a special emphasis is placed on these areas as a part of the undergraduate dental curriculum since the proportion of the populations on these medications are showing a steep upward trend [24]. Further complicating matters are the availability of newer antiplatelet and anticoagulants. The newer anticoagulants which come under the class of Novel Oral Anticoagulants (NOACs), such as dabigatran (direct thrombin inhibitors) and rivaroxaban (anti-factor Xa) have advantages over the traditional medications. They have less food and drug interactions, act faster and have shorter half-lives. Routine monitoring of prothrombin time and INR is not recommended while using these drugs [25]. Although current evidence on the dental managements of these patients is in the form of review articles, non dental data and opinion of experts, randomized control trials and evidence-based recommendations for these newer drugs would be published in the literature in the future [26-28]. This will require constant updates on the part of the dentist. As the switch is made to these newer drugs there will soon exist a divided population of patients on newer and older OAM's. Hence, there is an urgent need for every dentist and primary physician to update themselves on the current literature about the older OAM's before the newer OAM's are prescribed in



increasing numbers.

All these facts throw light on the dentists responsibility to update himself on the current evidence-based literature and weigh the risk of thromboembolic events and the bleeding risk from the dental procedure in consultation with the primary physician of the patient (who has prescribed the OAM) before considering the proposed management. The dentist's decision should also be based on their clinical setup and the resources available for effective control of any emergency during and after the procedure. In the case of lack of such facilities, it will be wise to refer them to a setup where such facilities are available or treat them in a hospital-based care. Jeske AH et al., [7], Wahl MJ [29] and Can MM et al., [13], stated in their published surveys that the Dentists should improve their knowledge about OAMs as their survey results were similar to the current study [7,13,29]. They also emphasized the need to organize more continuing dental education programs pertaining to this topic in their respective countries. Additionally, our survey shows that 91.4% of the participants accept the necessity to develop an exclusive practice guideline for managing patients using OAM in an Indian setup of the dental office.

## LIMITATION

There are some limitations of the present study which are worth mentioning. Since, the study used a face to face questionnaire it was not possible to survey a large sample size. The survey didn't attempt to differentiate the participants based on their specialty and training. Hence, it could be assumed that not all the dentists would perform all procedures listed in the questionnaire frequently. This could result in their response to be based on knowledge and not on routine practice.

## CONCLUSION

Results of our survey revealed that the surveyed population is well aware and knowledgeable about OAM's and management of patients on OAM's. However, there seems to be a hesitation to translate this knowledge into their practice because performing invasive dental procedures on patients under OAM therapy requires a delicate balance between the risk of peri-operative bleeding and the risk of thromboembolic complications. The authors suggest that the inclusion of this topic in the undergraduate program and organizing continuing education programs can help bridge the gap between knowledge and practice.

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