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Knowledge and Practices of Dentists Toward Patients on Antithrombotic Medication Therapy: A Cross-Sectional Survey

Pınar Erçal[1], Ayşegül Erten Tayşi[2], Soner Şişmanoğlu[3]

[1]Eastern Mediterranean University Faculty of Dentistry, via Mersin-10 Famagusta, North Cyprus, Turkey
[2]Department of Oral Surgery, Altınbaş University Faculty of Dentistry, Istanbul, Turkey
[3]Department of Restorative Dentistry, İstanbul University-Cerrahpaşa Faculty of Dentistry, Istanbul, Turkey

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Abstract

Objective: The objective of the present study was to describe the knowledge, perception, and practices of general dentists and dentists with various specializations regarding the management of patients on antithrombotic drug therapy.

Methods: A cross-sectional survey of dentists and specialists from different educational institutions and workplaces was conducted in Turkey between May 2022 and July 2022. The sample size comprised 153 subjects, and participants completed an electronic questionnaire containing 24 questions. Descriptive statistical analyses were performed to evaluate the data.

Results: Most of the surveyed dentists were aware of acetylsalicylic acid (ASA) and warfarin, while the novel antithrombotic agents apixaban and rivaroxaban were less known. Regarding the management of patients on novel oral antithrombotic medication during different dental procedures, there were no significant differences within groups according to clinical experience year ($P = .409$), whereas, for patients on ASA, both years of experience and area of expertise affected the participant's approach ($P = .001$). Monitoring of patients before dental procedures regarding blood tests did not differ according to years of clinical experience or specialty ($P = .185$, $P = .688$). Most participants (92%) sought a physician's opinion before invasive dental procedures, regardless of the type of oral antithrombotic medication.

Conclusion: The knowledge and dental management of patients on oral antithrombotic medications varied among dentists. Evident hesitancy toward treating such patients indicates a necessity for continuing education programs among dentists to provide better care for the patients without any fear of cardiovascular consequences.

Keywords: Dental procedures, anticoagulants, antithrombotic

Introduction

Oral antithrombotic medications (OAMs) are commonly used among populations for various cardiovascular events, including the prevention of strokes in atrial fibrillation and the treatment of venous thromboembolism. These patients are usually on long-term medications, and these medications may have notable ramifications in dental treatments. A recent epidemiological study conducted in Turkey reported a higher incidence of anticoagulant use in non-valvular atrial fibrillation patients than other published national studies,[1] which indicates that an important amount of the patients encountered in daily dental practice may be involved in such treatment.

The risk of bleeding during an oral surgical procedure and the potential risk of thromboembolic complications due to discontinuation of antithrombotic therapy must be carefully balanced, which poses a challenge for physicians and dentists. The recent approach toward patients on antithrombotic therapy prioritizes the morbid complications related to the interruption of these agents and recommends undergoing dental interventions with a continuation or bridging of the drug therapy.[2] Although dentists may be informed about the management of patients on antithrombotic medications, there is a tendency to overestimate the bleeding risk.[3] Lack of proper understanding and knowledge of mechanisms in use of antithrombotic agents and effective hemostatic and dental procedures that may be deemed safe in terms of bleeding can lead to complications or unnecessary referrals for these patients.

Warfarin, an antagonist of vitamin K, is widely used, and its therapeutic efficiency is dependent on maintaining the international normalized ratio (INR), a type of calculation based on the prothrombin time test, within the target range. However, patients on warfarin require close monitoring as the agent has a narrow therapeutic window and its dose may be influenced by other factors such as diet, other medications, comorbidities, and liver functions.[4] Several novel oral antithrombotic agents are introduced, such as dabigatran, rivaroxaban, and apixaban. These fast-acting agents are more predictable, require less monitoring, and have fewer interactions with food and other substances.[2] However, approaches toward patients on these newly introduced agents vary among dentists due to the lack of large-scale studies for dentoalveolar interventions in these patients.[5]

Hence, the aim of the present study is to understand the attitude and practice of general dentists and specialists regarding the management of patients on antithrombotic drug therapy with the intent to help the decision-making process with the latest evidence.

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Corresponding author: Pınar Erçal, Eastern Mediterranean University Faculty of Dentistry, Famagusta, North Cyprus
e-mail: pinarercal@gmail.com
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Methods

The study was approved by the Human Ethics Committee of Altınbaş University (Approval no: 2022/122). An electronic survey consisting of both open-ended and closed-ended questions was formulated based on a previous trial[3] with some modifications. A total of 24 questions were present in the survey. The first part of the survey included questions regarding the experience of participants in years, their practice, and if they had any specialties. The second part explored dentists' knowledge of OAMs and their interactions. The third part consisted of questions regarding dentists' daily practice and the dental management of patients on OAMs. A sample of survey questions and responses is given in Table 1.

Power analysis was applied using the G*Power software package, version 3.1.9 (Heinrich Heine University, Dusseldorf, Germany), to determine the sample size. The power of the study was taken as 1-ß = 0.95 and α = 0.05. A minimum sample size of 150 participants was required to give an actual power of 0.95 using the 0.05 level of significance according to the conducted power analysis (size effect=1.971) based on previous research.[6] The data was acquired via Google Forms, and entered in MS Excel, and analyzed using Graph Pad Prism Software, version 5.01 (Graph Pad Prism Software, Inc., CA, USA). The chi-square test was applied to find the level of significance among variables, and the significance was set to $P < .05$.

Results

Characteristics of the Participants

A total of 153 completed questionnaires were received. Figure 1 represents the characteristics of the participants. The majority of the dentists (n = 67) had 5-20 years of professional experience, while the distribution of least- and highly experienced clinicians was similar. Regarding specialist training, more than half of the dentists (60.1%) did not hold any specializations, followed by dentists with surgical specialties including oral surgery, implantology, and periodontology (24.2%) and nonsurgical specialties (15.7%). Most of the dentists worked either in private practice (37%) or private hospitals (32%). The frequency of dentists' encounters with patients on OAM was also questioned. Half of the participants responded that they see a patient on OAMs at least once a month.

Dentists' Knowledge of Oral Antithrombotic Medications

Dentists' responses to questions regarding their knowledge, attitude, and management of patients on OAM are presented in Table 1. Participants were allowed to choose multiple answers to pertinent questions. Dentists were mostly familiar with ASA and warfarin, with 152 and 143 participants selecting these medications, respectively. In contrast, awareness of novel antithrombotic medications was less, particularly with apixaban, which was recognized by only 51 participants. Nearly all the participants (99.3%) preferred to refer their patients for consultation with a physician before any dental procedures. For further evaluation, participants were asked when they would prefer to stop antithrombotic therapy, and 6 multiple-choice options were given. A large number of participants (n = 138) chose to stop OAM for surgical procedures such as multiple tooth extractions (more than 3 teeth per visit) and impacted tooth surgery. A few participants (17 of 153) opted to stop the OAM regimen prior to endodontic treatment.

Warfarin was the most common OAM (143 of 153 participants) among the participants and requires physician consultation before dental treatment, followed by clopidogrel (n = 117), heparin (n = 111), enoxaparin (n = 92), and ASA (n = 89). Penicillin was the

Table 1. Dentists' Responses to Questions Regarding Their Knowledge, Attitude, and Practice of Managing Patients on OAM

Question	Options	N (%)
Which OAM are you familiar with?	ASA	152 (20.9)
	Clopidogrel	122 (16.8)
	Warfarin	143 (19.7)
	Enoxaparin	80 (11)
	Apixaban	51 (7)
	Rivaroxaban	58 (8)
	Heparin	120 (16.5)
Prior to which dental treatment do you prefer to stop OAM treatment?	Extractions (less than 3)	87 (14.7)
	Multiple extractions	138 (23.3)
	Subgingival curettage	88 (14.9)
	Impacted tooth extractions	138 (23.3.)
	Implant surgery	124 (20.9)
	Endodontic treatment	17 (2.9)
For patients on which OAM regimen do you require physician consultation?	ASA	89 (16.1)
	Clopidogrel	117 (21.2)
	Warfarin	143 (25.9)
	Enoxaparin	92 (16.7)
	Heparin	111 (20.1)
Which blood test would you request for patients on warfarin treatment before dental procedures?	Complete blood count	28 (11.3)
	Bleeding and clotting time	86 (34.7)
	INR	115 (46.4)
	None	19 (7.7)
What is your choice of antibiotics for the patients on warfarin treatment?	Penicillin	108 (40)
	Cephalosporin	37 (13.7)
	Clindamycin	65 (24.1)
	Azithromycin	28 (10.4)
	Metronidazole	29 (10.7)
	None of the above	3 (1.1)
What do you prescribe as analgesics for patients on OAM?	NSAIDs	56 (31.6)
	Paracetamol	110 (62.1)
	Other	11 (6.2)
Which methods did you use to stop postoperative hemorrhage in patients using OAM?	Pressure	152 (26.6)
	Suture	115 (20.1)
	Application of a local anesthetic with epinephrine	54 (9.4)
	Gelatine sponge	111 (19.4)
	Tranexamic acid	89 (15.6)
	Cauterization	26 (4.5)
	Laser application	13 (2.3)
	Referral to other clinicians/ hospitals	12 (2.1)

ASA, acetylsalicylic acid; INR, international normalized ratio; OAM, oral antithrombotic medication; NSAIDs, nonsteroidal anti-inflammatory drugs.

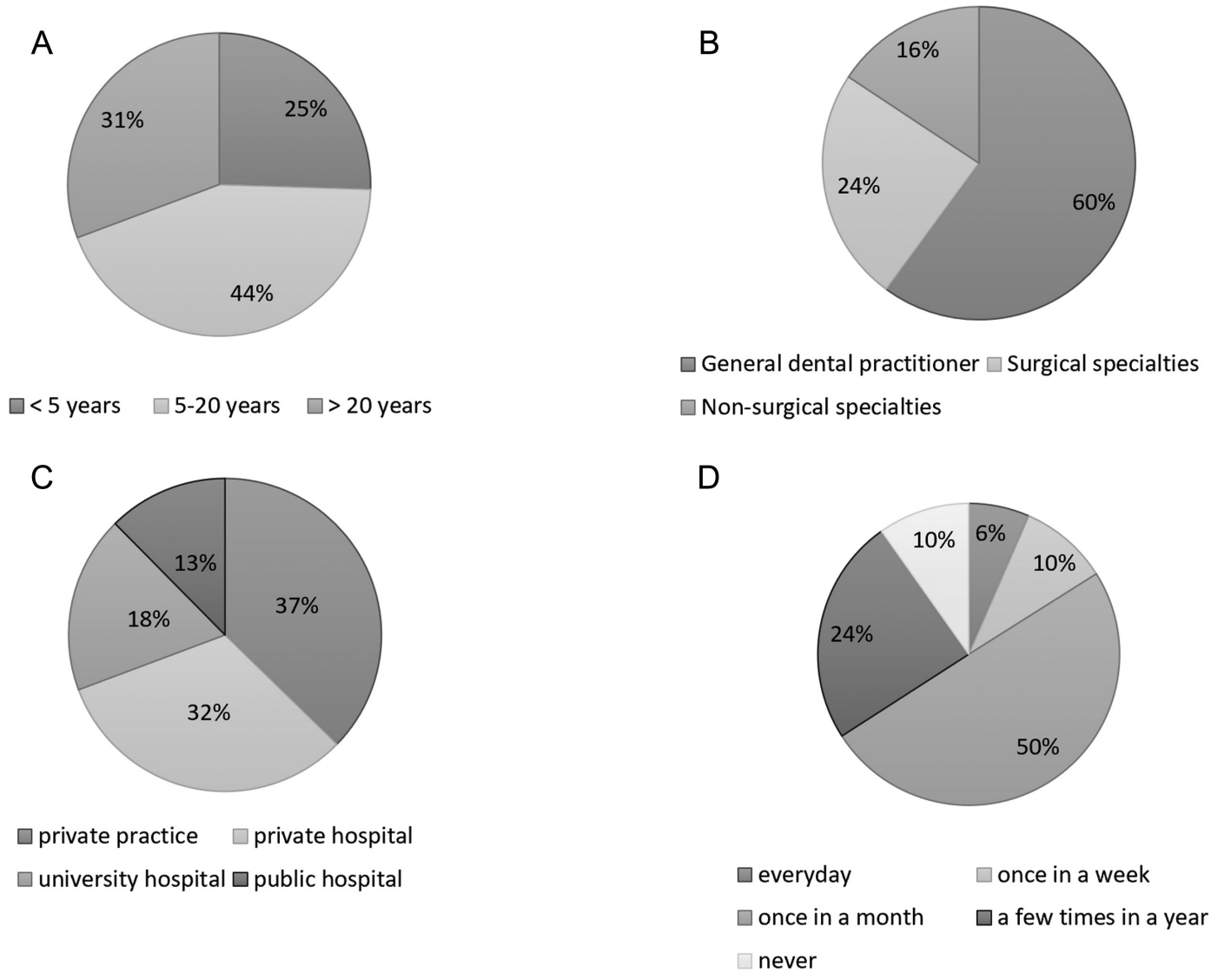

Figure 1. Distribution of participants according to (A) experience in years, (B) dental specialty, (C) work place, and (D) frequency of their encounter with patients on antithrombotic medications.

first choice of antibiotic for patients on warfarin (n= 108). Almost half of the participants would choose clindamycin (n = 65); the remaining participants chose cephalosporin (n = 37), metronidazole (n= 29), and azithromycin (n = 28). Just 3 dentists reported that they would not provide antibiotic treatment for their patients.

Paracetamol was the most prescribed analgesic (n = 110), which was followed by nonsteroidal anti-inflammatory drugs for postoperative pain management. Only 11 participants stated preferences for other pain medications.

Local hemostatic measures to stop postoperative hemorrhage were evaluated. The compression technique with sterile gauze (n = 152) was widely used, which was followed by suturing (n = 115) and the placement of hemostatic sponges (n = 111). Only 12 out of 153 participants admitted that they could not stop hemorrhages by means of different methods and referred the patient to a specialist for the management of postoperative surgical bleeding.

Attitude of Dentists Toward Patients on Oral Antithrombotic Medications

Most participants did not ask for routine blood tests from patients on OAM prior to dental treatment, regardless of their clinical experience or areas of specialty (Table 2). Request for a routine blood test before dental procedures were not determined by dentists' years of experience (chi-square test, $P = .185$) or areas of expertise (chi-square test, $P = .688$). However, dentists with surgical specialties and general dental practitioners were more prone to ask for routine blood tests than those with nonsurgical specialties. Further queries on specific blood tests to monitor patients on warfarin treatment before any dental treatment indicated that INR was the most common choice among participants (chi-square test, $P = .017$) (Table 3). Specifically, general dentists were prone to seek both clotting time and bleeding time, besides INR test results for those on warfarin treatment (chi-square test, $P = .057$). For patients on aspirin, participants were significantly more prone to refer their patients for blood investigations like clotting time, bleeding time, or INR (chi-square test, $P = .008$).

Management of Patients on Oral Antithrombotic Medications

Regardless of years of experience and area of expertise, most participants stated that they would perform all noninvasive dental procedures without any changes in the OAM regimen (Figure 2). Contrarily, in the case of invasive dental procedures,

Table 2. Attitude of Dentists in Regard to Routine Blood Test Demand with Patients on Oral Antithrombotic Medications Before Dental Procedures.

		Requests Blood Tests, N (%)	Does Not Request Blood Tests, N (%)	*P*
Years of clinical practice	<5	12 (30.8)	27 (69.2)	.185[a]
	5-20	14 (20.9)	53 (79.1)	
	>20	17 (36.2)	30 (63.8)	
Specialty	Surgical specialties	11 (29.7)	26 (70.3)	.688[b]
	Nonsurgical specialties	5 (20.8)	19 (79.2)	
	General dental practitioner	27 (29.4)	65 (70.6)	

[a]Chi-square: 3.374. [b]Chi-square: 0.747.

most participants stated that they would request a physician consultation prior to the relevant procedure. There was no significant difference between participants' approaches in terms of years of experience and area of expertise in both types of dental procedures ($P > .05$).

Regarding the management of patients on OAM during different dental procedures, there were no significant differences within groups in terms of clinical experience or specialty training. Sixty-six percent of participants would perform noninvasive procedures without changing OAM regimen, whereas 91.5% of participants would consult the patient's physician before any invasive procedure that would involve bleeding.

There were significant differences between participants' management of patients on ASA treatment according to years of experience (chi-square test, $P = .001$) and area of expertise (chi-square test, $P = .001$) (Table 4). While participants with more than 20 years of experience stated that they would prefer the discontinuation of ASA for their patients prior to extraction, most participants with 5-20 years of experience stated that they would perform tooth extraction only if their patients received low-dose ASA treatment (≤100 mg daily). Conversely, there was no significant difference between participants' approaches toward their patients on novel OAMs according to years of experience (chi-square test, $P = .409$). Most participants stated that they would rather seek a physician's opinion before carrying out a tooth extraction for a patient on novel antithrombotic medicine, regardless of years of experience.

Almost half of the participants would agree to perform tooth extraction when INR values ranged from 1.0 to 2.0 (Figure 3). Major concerns after invasive dental procedures were mostly defined as postoperative bleeding and thromboembolic complications among the participants. Clinical experience or specialty did not significantly affect the type of concern among surveyed dentists (Table 5).

About 92.9% of dentists who took the survey considered that there is a need for a practice guideline on the "Management of patients on OAM requiring dental treatment."

Discussion

Patients who pose a risk for clot formation due to various cardiac conditions, such as a history of deep vein thrombosis, nonvalvular atrial fibrillation, and cardiac arrhythmia, are prescribed OAMs for maintenance. As a considerable number of dental treatments may lead to intra- and postoperative bleeding, dentists may be hesitant to treat these patients. In addition, the severe risk of stopping OAMs for dental treatment needs to be balanced against possible consequences related to prolonged bleeding.[7] As

Table 3. Practice of Dentists Regarding Their Choice of Blood Tests for Patients on Warfarin Treatment and for Patients on Acetylsalicylic Acid

		Complete Blood Count, N (%)	Bleeding and Clotting Time, N (%)	INR, N (%)	None, N (%)	*P*
Patients on warfarin treatment						
Years of clinical practice	<5	9 (13)	24 (34.8)	36 (52.2)	0 (0)	.017[a]
	5-20	11 (10.5)	34 (32.4)	48 (45.7)	12 (11.4)	
	>20	8 (10.8)	28 (37.8)	31 (41.9)	7 (9.5)	
Specialty	Surgical specialties	7 (11.5)	19 (31.1)	34 (55.7)	1 (1.6)	.057[b]
	Nonsurgical specialties	5 (13.2)	14 (36.8)	14 (36.8)	5 (13.2)	
	General dental practitioner	16 (10.7)	53 (35.6)	67 (45)	13 (8.7)	
Patients on ASA treatment						
Years of clinical practice	<5	0 (0)	25 (46.3)	22 (40.7)	7 (13)	.008[c]
	5-20	0 (0)	35 (40.2)	23 (26.4)	29 (33.3)	
	>20	0 (0)	22 (35.5)	18 (29)	22 (35.5)	
Specialty	Surgical specialties	0 (0)	24 (46.2)	16 (30.8)	12 (23.1)	.43[d]
	Nonsurgical specialties	0 (0)	14 (41.2)	12 (35.3)	8 (23.5)	
	General dental practitioner	0 (0)	44 (37.6)	35 (29.9)	38 (32.5)	

ASA, acetylsalicylic acid; INR, international normalized ratio.
[a]Chi-square: 18.656. [b]Chi-square: 15.114. [c]Chi-square: 17.397. [d]Chi-square: 5.942.

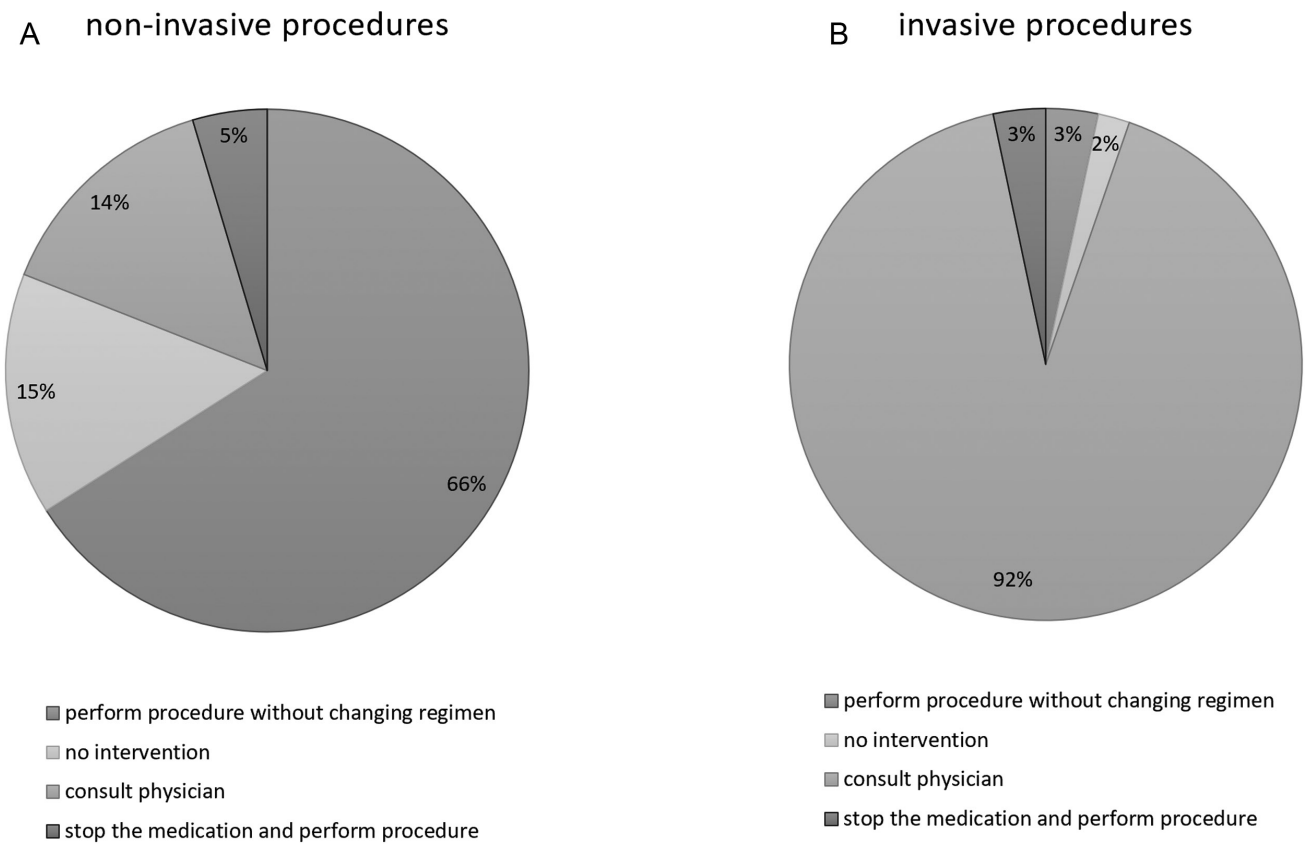

Figure 2. Practice of participants toward patients on OAM (A) for noninvasive dental procedures and (B) for invasive dental procedures that would result in bleeding.

Table 4. Approach Toward Patients on Acetylsalicylic Acid and Novel Oral Antithrombotic Medications Among Participants, with the Question "Would You Extract a Tooth of a Patient on OAM?"

		Yes, N (%)	Yes, But I Would Request Drug Holiday, N (%)	Yes, If the Patient Uses 100 mg or Less, N (%)	No, I Would Ask for Consultation with the Patient's Physician, N (%)	*P*
Patients on ASA treatment						
Years of clinical practice	<5	5 (12.8)	2 (5.1)	17 (43.6)	15 (38.5)	.001[a]
	5-20	12 (17.9)	3 (4.5)	36 (53.7)	16 (23.9)	
	>20	7 (14.9)	14 (29.8)	13 (27.7)	13 (27.7)	
Specialty	Surgical specialties	7 (18.9)	0 (0)	23 (62.2)	7 (18.9)	.001[b]
	Nonsurgical specialties	6 (25)	1 (4.2)	5 (20.8)	12 (50)	
	General dental practitioner	11 (12)	18 (19.6)	38 (41.3)	25 (27.2)	
Patients on novel OAM treatment						
Years of clinical practice	<5	4 (10.3)	2 (5.1)	0 (0)	33 (84.6)	.409[c]
	5-20	4 (6)	4 (6)	2 (3)	57 (85.1)	
	>20	1 (2.1)	5 (10.6)	0 (0)	41 (87.2)	
Specialty	Surgical specialties	2 (5.4)	4 (10.8)	0 (0)	31 (83.8)	.025[d]
	Nonsurgical specialties	3 (12.5)	1 (4.2)	2 (8.3)	18 (75)	
	General dental practitioner	4 (4.3)	6 (6.5)	0 (0)	82 (89.1)	

ASA, acetylsalicylic acid; OAM, oral antithrombotic medication.
[a]Chi-square: 23.129.[b]Chi-square: 23.12.[c]Chi-square: 6.131.[d]Chi-square: 14.419.

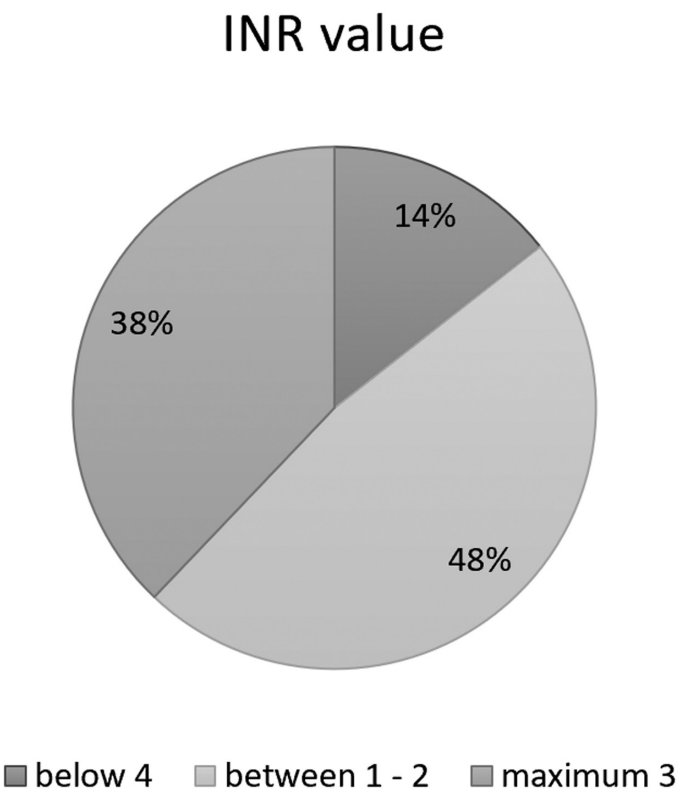

Figure 3. Target international normalized ratio (INR) values according to participants.

most local prevention methods, such as pressure, suturing, and the use of local hemostatic agents, can stop bleeding in the oral region, reducing or stopping these agents may not be in favor of the well-being of these patients. Current understanding indicates that most patients on OAMs are not required to change their regimen prior to dental treatment, whereas in patients with a higher risk of bleeding due to comorbidities, patients' physicians can be consulted, or dental treatment can be delayed.[8] Therefore, dentists must be aware of current guidelines regarding the management of patients on OAMs before dental interventions. The purpose of the study was to evaluate if participants were aware of current approaches toward OAMs, if they could apply advised guidelines to their practice, and their hesitancies toward this patient group. By determining the current practice of dentists, the results might enable dentists to enhance themselves and might emphasize the necessity of establishing accessible and updated guidelines in Turkey for dentists.

In the present study, participants were asked to choose OAM from a list including ASA, clopidogrel, warfarin, enoxaparin, apixaban, rivaroxaban, and heparin. Acetylsalicylic acid, warfarin, heparin, and clopidogrel were recognized by most dentists, whereas the new generation of OAM, enoxaparin, apixaban, and rivaroxaban, was less known among the participants, with a range of 7%-11%. The current study agrees with several studies showing a lack of awareness on new generation of OAMs among the studied participants.[3,9-11] The pharmacologic characteristics of novel OAMs differ from traditional OAMs such as warfarin, as they are provided in fixed doses with less need for monitorization, a shorter half-life, and fewer drug interactions.[12] According to the European Heart Rhythm Association, dental interventions considered as minor risks that do not necessitate disruption of novel OAMs are implant placement, subgingival scaling, periodontal surgery, and extraction of 1-3 teeth.[13] Therefore, it is safe to say that dentists can be more comfortable with patients on OAMs when performing most dental surgeries if they adhere to current guidelines. However, it should be noted that high-level evidence, such as randomized clinical trials regarding novel OAM discontinuation for dental treatments, is not sufficient.

Among the OAMs, ASA was recognized by all participants, followed by warfarin. This result is reasonable, as ASA is the most widely used medication worldwide and has been a drug of choice for decades to prevent cardiovascular diseases.[14] Ibdah et al[10] reported that 25% of surveyed dentists prefer to stop the ASA regimen before dental procedures. Can et al[9] reported that nearly 88%-93% of dentists in Central Eastern Turkey preferred to suspend ASA treatment before a dental procedure. In the current study, a lesser percentage of participants (12.4%) requested a drug holiday, which indicates a wider understanding of current concepts since the conduct of the previous study, but an important number of dentists also preferred to consult with patients' physicians for OAM intake, suggesting hesitancy regarding cardiovascular consequences.

Most dentists preferred to consult with the patient's physician before dental procedures regarding their warfarin regimen (n = 143), which is consistent with the widespread awareness regarding warfarin among the surveyed group. The consultation percentage for patients on enoxaparin was similar to that of ASA, which is potentially not related to awareness but due to the drug's lesser recognition. However, consultation requests before dental treatment in patients using ASA (n = 89), which is a highly known medication among the participants, were also significant. Despite

Table 5. Major Concern After an Invasive Procedure for Patients on Oral Antithrombotic Medications

		Intraoperative Bleeding, N (%)	Postoperative Bleeding, N (%)	Thromboembolic Complications, N (%)	*P*
Years of clinical practice	<5	3 (7.7)	19 (48.7)	17 (43.6)	0.517[a]
	5-20	2 (3)	25 (37.3)	40 (59.7)	
	>20	3 (6.4)	20 (42.6)	24 (51.1)	
Specialty	Surgical specialties	2 (5.4)	14 (37.8)	21 (56.8)	0.765[b]
	Nonsurgical specialties	2 (8.3)	8 (33.3)	14 (58.3)	
	General dental practitioner	4 (4.3)	42 (45.7)	46 (50)	

[a]Chi-square: 3.246. [b]Chi-square: 1.842.

its wide recognition, this finding might be related to the overestimated potential hemorrhage risk of patients on ASA or a lack of knowledge of current guidelines. The latest guideline of the Scottish Dental Clinical Effectiveness Programme recommends treating patients on ASA without interrupting their regimen, with consideration to limiting the initial treatment area and staging any necessary extensive procedures by using local hemostatic measures.[15] The recommendation is the same for patients on other antiplatelet drugs, including clopidogrel, prasugrel, dipyridamole, or ticagrelor, single or dual therapy with aspirin. A clinical study on bleeding time after dental extraction in patients on dual antiplatelet therapy concluded that there was no significant difference in bleeding time in treatment and control groups, advising no alteration to the drug regimen before minor oral surgical procedures.[16] On the other hand, an interesting study on the knowledge and attitude of cardiologists toward alteration in OAM prior to dental treatment indicated a high percentage of participants recommending interruption of OAMs with varying days, mostly for major dental procedures.[17] As there was no specific agreement between surveyed cardiologists on what a major and minor dental procedure include, the high ratio for alteration in OAM may be misleading.

The participants were attentive to cooperating with medical practitioners who prescribed the patients' OAM via consultation before commencing any dental treatment.[14,18] When antiplatelet agents are combined with anticoagulants, there is a need for consultation with the patient's prescribing clinician to assess the impact of drugs and the risk of bleeding as recommended by the latest guideline.[15] The majority of participants preferred to consult with a physician or cardiologist before extractions (85.6%) for patients on novel OAMs. In addition, participants were reluctant to extract teeth, with only 5.9% performing the procedure, whereas 15.7% agreed to do extractions of patients on ASA, which further supports the previously mentioned hesitancy. Interestingly, having a surgical specialty did not affect the tendency to seek consultation on novel OAMs, as the percentage ranged between 75 and 89 between groups. Similar to specialization, years of clinical practice exhibited the same pattern, which might suggest that more experienced clinicians tend to stick to their routine practice with less adherence to new guidelines, and young clinicians may be more hesitant with OAM patients as they may not be confident due to lack of clinical experience. A study conducted with final-year dental students reported that, despite having less knowledge of novel OAMs, they were willing to provide dental care for patients on OAM therapy.[19] These findings highlight the need to implement guidelines for the management of these patients into the dental curriculum, both for the continuing education courses of dentists and for the training of young dentists.

Although participants indicated that they would request blood tests for patients on OAM, a considerable number of participants (13.7%) were hesitant in performing any kind of dental procedures with this patient group, even with blood test values within dental intervention ranges. Having a specialty degree was not determinant in this regard, as there was no significant difference between groups; however, participants with surgical specialties were more prone to treat patients on OAM as expected. Regarding the most appropriate blood test for patients on warfarin, participants indicated a good level of knowledge as they would ask for INR. However, the knowledge regarding the current target value for the management of these patients when they undergo surgical procedures was found to be questionable. Nearly half of the participants responded that the target INR value needs to be between 1 and 2 before dental surgery. Systematic reviews indicate that the postoperative bleeding rate is similar after minor dental surgery in patients who continue their medication with those who withdraw, and patients with INR 3.0 or less can maintain their regular antithrombotic regimen before dental intervention.[20] The latest guideline of the Scottish Dental Clinical Effectiveness Programme suggests treatment without interrupting medication if INR is below 4, with limiting initial treatment area and staging extensive procedures.[18] A clinical study investigated the incidence of postoperative bleeding and concluded that there is no need to stop warfarin when INR is below 4 or interrupt dual antiplatelet therapy before dental extractions, as there was no significant difference compared to the control group.[21] The results of the present survey suggest an update is necessary for dentists so that they can be more confident in providing care for patients on warfarin treatment with INR values below 4.

Several antibiotics are considered high risk, such as metronidazole, ciprofloxacin, azithromycin, and clarithromycin, as they interact with warfarin and increase INR values, leading to a risk of bleeding, whereas clindamycin and cephalexin pose a low risk.[22] On the other hand, some antibiotics may decrease the hepatic metabolism of warfarin such as cotrimoxazole and metronidazole, which also necessitate caution.[23] A recent systematic review highlighted the risk of bleeding in patients on warfarin using antifungals and antimicrobials, which manifests as gastrointestinal tract bleeding.[24] According to the latest guidelines, in dental practice, antimicrobial prescriptions are very limited and must be kept to a minimum. Conditions requiring antimicrobials include acute periapical infections, dentofacial abscesses, pericoronitis, osteomyelitis, and prophylaxis. The choice of antimicrobials in these circumstances are penicillin, metronidazole, clindamycin, and clarithromycin depending on the disease. Current guidelines for dentistry highlight the serious consequences of the interaction between warfarin and metronidazole and macrolide antibiotics and advice against prescribing metronidazole for patients on warfarin in dental practice.[25, 26] In the current study, most dentists preferred to prescribe penicillin, which was followed by clindamycin for patients on warfarin when necessary. Some participants also selected metronidazole for antimicrobial preference. As all antibiotics carry the potential to interact with warfarin when coadministered, and some serious consequences are possible, dental practitioners need to be aware of any interference with the patient's current OAM regimen and take precautions when carrying out procedures with bleeding risk.

There are some limitations worth mentioning with the current study. The demographics of participants, such as their location, was not evaluated. A larger sample size with participants from different regions of Turkey would reflect a more generalized attitude of dentists toward OAMs. The format of the survey was online to reach more dentists, and it was promoted by the Chamber of Dentists to its members by e-mail. Although the sample size was adequate for analysis in accordance with similar studies, the response rate could be increased. This could be due to dentists not participating or not completing the survey, as there were 26 questions to be answered, which may take a longer time than anticipated for participants.

The results of the present study revealed that the surveyed dentists are aware of OAMs and the management of patients on OAM regimens. However, knowledge of novel OAMs is less known compared to conventional OAMs, and there is hesitation when providing care to these patients, as the majority tend to consult before dental procedures or refrain from performing invasive dental treatment. In accordance with the request of surveyed dentists, there is a need for practice guidelines and updated continuing education

courses for dentists in Turkey, which would help them provide the latest care for their patients.

Data Access Statement: Data supporting this study are included within the article and/or supporting materials.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of Altınbaş University (Approval no: 2022/122, Date: 17/03/2022).

Informed Consent: Written informed consent was obtained from the participants who agreed to take part in the study.

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