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## ORIGINAL ARTICLE

# Knowledge of medical and dental practitioners towards dental management of patients on anticoagulant and/or anti-platelet therapy

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## KEYWORDS

Anticoagulants;  
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**Abstract** *Objective:* The purpose of this study was to evaluate the knowledge of medical and dental practitioners towards the dental management of patients who are on anti-coagulant and/or anti platelet agents.

*Methods:* This study was conducted in different hospitals/health centers of Riyadh and AlKharj cities, Saudi Arabia. Participants included practitioners working in government and private medical centers/hospitals. A self-administered questionnaire including details about the practitioners' level of education and work experience was used. Participants were asked questions regarding dental management of patients on anticoagulant therapy and/or antiplatelet therapy. *Result:* A total of 650 self-administered questionnaires were distributed among dental and medical practitioners, of which, 543 were returned complete. Most of the participants were general

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(graduate) medical and dental practitioners (59.3%). 15.4% practitioners were in favor of continuing the antiplatelet or anticoagulant medication without alteration while 6.6% were unsure about stopping or continuing the medication. A less than half (35.3%) of the practitioners were using current guidelines for managing such patients. Dentist (58.6%) and medical practitioners (64.7%) felt that evidence based guidelines would be helpful in dental management of patients on antithrombotic therapy.

**Conclusion:** Dentists and medical practitioners showed a wide range of approach in terms of knowledge related to management of patient taking anticoagulant and/or antiplatelet medication prior to dental treatment. There is a need to educate both medical and dental practitioners to use evidence based guidelines for management of such patients.

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## 1. Introduction

Oral anticoagulants and anti-platelets drugs are widely prescribed for the prevention of various medical conditions, including thromboembolism, atrial fibrillation, multiple venous thromboembolism, congestive heart failure and artificial heart valves.<sup>1</sup> The most commonly used anticoagulant and anti-platelet drugs include warfarin, enoxaparin, aspirin and clopidogrel.<sup>2,3</sup> One of the side effects of this class of drug is that these prolong bleeding time that can cause problems especially after surgical procedures.<sup>4,5</sup> Due to growing cardiovascular disease burden, performing dental procedures on patients who are taking oral anticoagulants is common nowadays. Although bleeding or haemorrhage is a frequent complication for such patients, there is controversy concerning the change or discontinuation of anticoagulation and antiplatelet drugs during minor dental surgery such as tooth extraction.<sup>6</sup>

The dental management of patients on anticoagulant therapy is still being debated with some clinicians preferring to follow the routine practice of arranging to stop anticoagulant/anti-platelets while others prefer the continuation of anticoagulant/antiplatelet therapy.<sup>6,7</sup> The argument to stop anticoagulant/antiplatelet drugs few days before a dental procedure is to prevent potential bleeding while the argument to continue with such medication is to concentrate more on providing careful monitoring of patient's International Normalized Ratio (INR) and the use of local haemostatic measures.<sup>7</sup> For Patients requiring dental procedures and with significant thromboembolic events, discontinuation of warfarin could produce fatal consequences.<sup>8</sup> These patients can benefit from bridging therapeutic approach to employ low molecular weight heparin or newer anti-coagulant drugs after consultation with patient's physician.<sup>3,5</sup> Therefore, dentists should be aware of their patients' medical condition. Appropriate preoperative assessment of the patient's medication should always be considered to provide optimal care. In a study of Spanish students, the overall findings showed that educational programmes about anticoagulation should be used to improve students' knowledge of and attitudes about this topic, especially given the lack of standardized protocols and education at Spanish universities.<sup>9</sup> Salam et al. suggested that patients who are taking warfarin and have an INR less than or equal to 4.0 can be managed in primary care practice. General dental practitioners (GDPs) should follow published guidance, particularly for single, straightforward extractions. Many GDPs, however, refer patients taking warfarin to their local hospital,

increasing waiting times for consultation before extraction.<sup>10</sup> For most patients undergoing simple single dental extractions, the morbidity of potential thromboembolic events if anticoagulant therapy is discontinued clearly outweighs the risk of prolonged bleeding.<sup>11</sup>

The overall frequency of persistent bleeding (2%) is low when all dental procedures are considered for patients on warfarin therapy. If considering only dental patients undergoing extractions and implant placement, the frequency increases to 4.8%. The results suggest that patients are at greater risk for postoperative bleeding if concurrent medications are used that could affect their ability to maintain a clot.<sup>12</sup> The development of new orally administered anticoagulant drugs over the past few years has focused on eliminating some of the disadvantages associated with warfarin.<sup>13</sup>

The aims of this study were to determine the level of knowledge and attitudes of medical and dental practitioners regarding dental management of patients receiving anticoagulant and/or anti-platelet therapy.

## 2. Methods

A self-administered questionnaire was administered among medical and dental practitioners. Questionnaire contained fourteen questions. The first section contained questions about the demographic data including age, gender and level of education. The second section concentrated on medical and dental practitioner's knowledge and approach for management of patients on anticoagulant and/or antiplatelet therapy. Study was conducted in various health centers and hospitals in Riyadh and Al-Kharj cities, Saudi Arabia from January 2013 till August 2013. A total of 543 questionnaires were completed and returned by participants.

Statistical Package for Social Sciences (SPSS version 20) was used for data entry and analysis. Descriptive and inferential statistics were used to forecast results. Frequencies cross tabulations and charts were used in descriptive statistics and correlation, chi-square test and analysis of variance (ANOVA) were used on inferential statistics.

## 3. Results

A total of 650 questionnaires were distributed among dental and medical practitioners and 543 were returned complete (response rate of 83.5%), 43.6% of the participants were female and 56.3% were male. Most of the participants (79%)

were below 40 years with 21% above the age of 40 years. The total number of dentists who participated in the survey was 302 as compared to 241 medical practitioners. Most of the participants were general practitioners (59.35%), while 30.9% had postgraduate degrees and few were holding higher degrees such as PhD (6.4%). There was a higher percentage (58.9%) of Medical practitioners holding postgraduate degrees as compared to the dental practitioner group (41%). About 78% of the dentists and medical practitioners had an experience in the profession up to 10 years. However, majority among the dental practitioner group ( $n = 194$ ) had less than 5 years of clinical experience. The overall experience was higher in the medical practitioner group. Most of the respondents (47.14%) represented primary level of health care. Majority of the respondents 72.37% represented governmental institutions. There was no significant statistical difference among gender across various opinions (Table 1).

Dentists and medical practitioners were asked about their concern with anti-platelet agents (Aspirin and Clopidogrel) and anti-coagulant (Warfarin). Evaluation of responses showed that it was statistically significant ( $p < 0.001$ ) that most dentists had concern related to aspirin (53.3%) while medical practitioners' main concern was warfarin (59.3%), (Fig. 1).

The majority of dentists and medical practitioners (77.9%) wanted to stop antiplatelet or anticoagulant drugs before any surgical procedure like tooth extraction. More dentists ( $n = 84$ ) as compared to medical practitioners ( $n = 50$ ) were in favor to stop aspirin prior to any oral surgical procedure

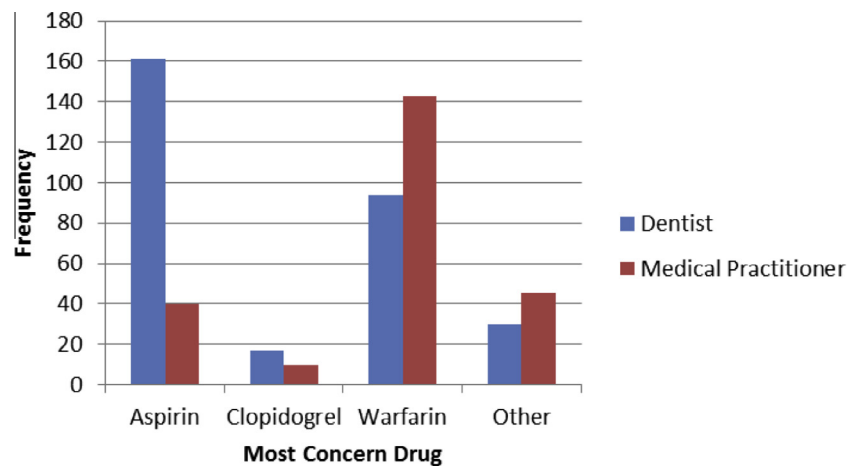
and the difference in opinion was statistically significant (Chi-square test,  $p = 0.001$ ) A total of 84 (15.4%) dentists and medical practitioners were in favor of continuing the anti-platelet or anticoagulant medication without alteration while 6.6% were unsure whether to stop the medication or continue its use (Fig. 2).

The percentage of dentists and medical practitioners who prefer to ask a specialist opinion prior to such treatment was 64.6%. Time to request blood investigation, for those patients taking warfarin, was also asked and most of the respondents were in favor to do the blood test within 72 hours (Table 2). More number of dental practitioners were unaware of the proper laboratory investigation for such patients prior to dental treatment as compared to medical practitioners. 53% ( $n = 160$ ) of dentists and 74% ( $n = 179$ ) of medical practitioners were of the opinion that INR is mandatory before dental treatment for patients on anticoagulants. Few dentists and medical practitioners (9.3%) were not aware which blood test should be requested prior dental treatment for such patients (Fig. 3).

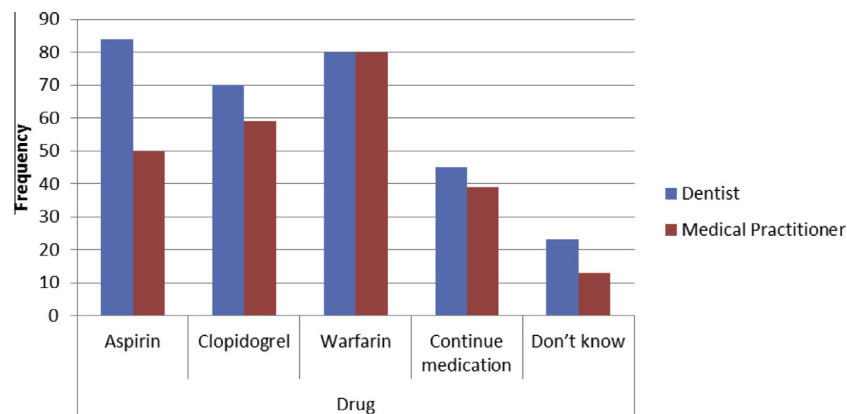
Approach of medical practitioners, towards the use of current guidelines in the management of patients, was significantly different from dentists ( $p < 0.001$ ). A 28.8% of medical practitioners were in favor to use current guidelines. While in dentists, 17.8% wanted to follow the current guidelines. Dentist (58.6%) and medical practitioners (64.7%) felt that the evidence based guidelines would be helpful in dental management of patients on anticoagulant and/or antiplatelet therapy (Fig. 4).

**Table 1** Demographics of the participants with their profession.

	Profession		Total (overall % age)
	Dentists (% age)	Medical Practitioners (% age)	
<i>Age</i>			
25–30	185(72.55)	70(27.45)	255(46.96)
31–40	79(45.4)	95(54.6)	174(32.04)
41–50	26(29.88)	61(70.11)	87(16.02)
50 +	12(44.44)	15(55.55)	27(4.67)
<i>Gender</i>			
Male	175(57.19)	131(42.81)	306(56.35)
Female	127(53.58)	110(46.41)	237(43.65)
<i>Highest study</i>			
Graduate	216(67.08)	106(32.91)	322(59.3)
Post Graduate	69(41.07)	99(58.92)	168(30.94)
Doctorial PhD	14(40)	21(60)	35(6.44)
Other	3(16.67)	15(83.33)	18(3.31)
<i>Experience (Years)</i>			
Less than 5	198(72.53)	75(27.47)	273(50.28)
6–10	76(50.67)	74(49.33)	150(27.62)
11–15	8(13.33)	52(86.67)	60(11.05)
15 +	20(33.33)	40(66.67)	60(11.05)
<i>Institution</i>			
Government	247 (62.84)	146 (37.15)	393 (72.37)
Private	55 (36.67)	95 (63.33)	150 (27.62)
<i>Level of care</i>			
Primary	148 (55.26)	108 (42.18)	256 (47.14)
Secondary	88 (61.11)	56 (38.88)	144 (26.51)
Tertiary	66 (45.83)	77 (53.47)	143 (26.33)



**Figure 1** Opinion of the practitioners regarding the most concerned medicine.



**Figure 2** Opinion of practitioners for the medicine to be stopped before dental procedure.

**Table 2** Practitioners' approach towards the ideal time for blood investigation.

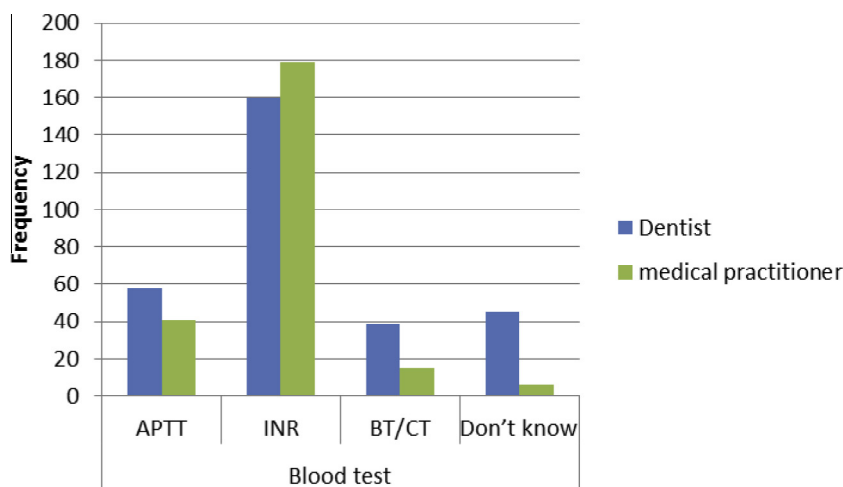
Profession	Time of blood investigation				Total
	Within one week	Within 72 h	Same day	Do not know	
Dentist	59	133	62	48	302
Medical Practitioner	64	110	43	24	241
Total	123	243	105	72	543

#### 4. Discussion

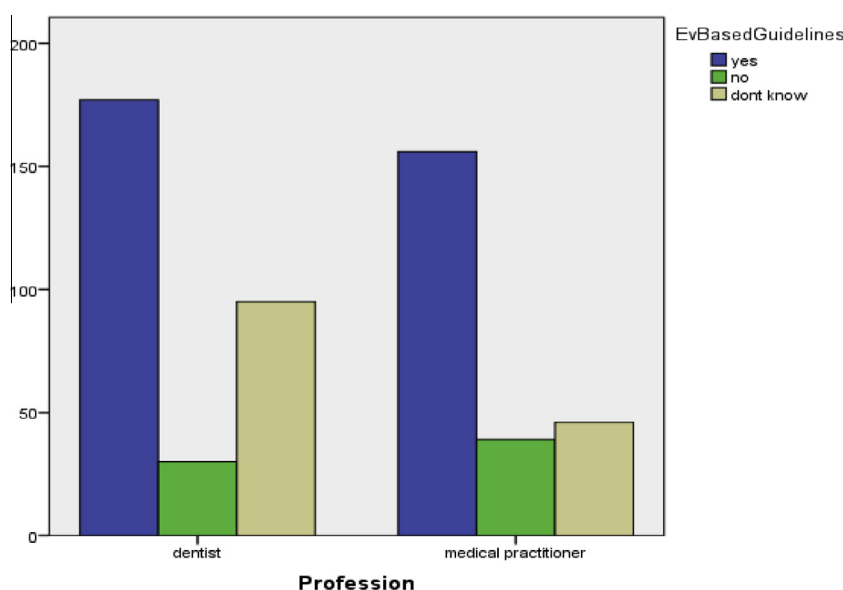
Patients who are on anticoagulant therapy and undergoing surgical procedures may be at risk of bleeding. Growing number of evidences suggest that stopping anticoagulant therapy before dental procedure may increase risk of thrombo-embolic events.<sup>14,15</sup> Different guidelines regarding how to manage such patients before surgical interventions have been proposed in the literature.<sup>16,17</sup> It is clear from the results of the present study that the subject of managing patients who are on anticoagulant and/or antiplatelet therapy is still not a straightforward issue. Despite the availability of some guidelines, the management of dental patients receiving anticoagulant and/or antiplatelet therapy is still not well defined.

##### 4.1. Concern for anticoagulants (Warfarin)

Although the post-operative bleeding associated with the use of warfarin can be life threatening as compared to aspirin,<sup>18</sup> it is obvious from our survey that dentists are more concerned about aspirin than warfarin. The concern for aspirin rather than warfarin among dental practitioners', particularly general dental practitioners, may be due to the fact that they are more exposed to treating patients on aspirin than those on warfarin. A high percentage (77.95) of participants in the present study wanted to stop the anticoagulant therapy before dental procedure. Fortunately though, such preference is supported by a high percentage that would need to seek a specialist opinion or help for such a decision. The American College of Chest



**Figure 3** Opinion of practitioners for blood investigation to be requested for the patients on anticoagulant and/or antiplatelet therapy.



**Figure 4** Opinion about benefiting from evidence based guidelines in patient management.

Physicians suggest that patients should stop warfarin 5 days before the surgical intervention and temporarily replacing warfarin with low molecular weight heparin in case of extensive surgical procedures.<sup>5,19</sup> The American Heart Association suggests reducing the INR to a range between 2.0 and 2.5 with a strict INR monitoring.<sup>20</sup> Many studies discuss whether to stop or continue anticoagulant therapy when performing different dental procedures. For instance, it has been reported that dental extraction can be done safely in patients taking warfarin providing that the INR level is below 4.0.<sup>20,21</sup>

#### 4.2. Concern about antiplatelets (Aspirin)

The overall experience in the medical practitioner group was higher than the dental practitioner group. Many among dental practitioners prefer to stop aspirin before any oral surgical procedure as compared to medical practitioners. Such variations in opinions are considered normal owing to the lack of clear guidelines on this aspect. Moreover, dentists have been

following the routine non-evidence based practice of stopping the medication before treatment for fear of excessive post-operative bleeding.

#### 4.3. International Normalized Ratio (INR)

Although INR is considered a critical test in patients on anti-coagulant therapy, only 53% of participant dental practitioners and 74% of medical practitioners reported that it is a mandatory test. This can be attributed towards lack of knowledge among dentists as compared to medical practitioners about the investigations needed for patients on warfarin. Working with patients who are taking anticoagulants without measuring their INR could lead to major complications.<sup>18</sup> Timing of INR is also important as its values may vary drastically if it is not measured within the recommended duration. Guidelines state that INR of patients should be measured within 72 h before oral surgery or ideally within 24 h.<sup>22</sup> Regarding the ideal timing for blood investigation a high



percentage 64.08% were in favor of doing the test 72 h or earlier (same day), prior to the dental procedure. Blood investigations may be invalid at the time of the dental appointment especially with INR that could be at a different level and could lead to serious consequences. It has been stated that non adherence of INR monitoring for patients on anticoagulant therapy can be associated with high risk of bleeding.<sup>23</sup>

#### 4.4. Evidence based guidelines

For medical conditions like; atrial fibrillation, pulmonary embolism etc. patients are placed on anticoagulant (commonly on warfarin) in order to prevent any consequences.<sup>24</sup> During the era of 1940–1980, Dentists and authors had perception that patients on warfarin often have prolonged bleeding and adjustment of warfarin regime was required before invasive dental treatment.<sup>25,26</sup> However, recent literature regarding warfarin and dental surgery, added the knowledge that normal oral surgical procedures can be performed without the need for alteration of the anticoagulant dose.<sup>7</sup> In 2007, British Committee for standards in Haematology (BCSH) together with British Dental Association and National Patient Safety Agency prepared a guideline for managing patients on warfarin. The guidelines state that patients, on warfarin with stable INR of  $\leq 4$ , have very small risk of significant bleeding.<sup>15,22</sup> In spite of the presence of such guidelines in the literature, it is still difficult especially for dentists to follow such guidelines. In the present study a little percentage among dentists (17.8%) and medical practitioners (28.8%) were following these guidelines. Such hesitation in following guidelines shows that the management of patients on anticoagulant therapy still needs more clarification for practitioners. 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 practitioners to update their knowledge and practice related to managing patients on anticoagulant therapy prior to dental treatment.<sup>17</sup>

However, there are some situations in which patients' management becomes quite difficult. For instance, when patients are taking both warfarin and anti-platelet agents, when patient has a disease that modifies pharmacokinetics of warfarin or when a patient has a bleeding disorder.<sup>27</sup> Therefore it is advisable that any patient with complicated medical history and warfarin treatment and multiple medications should be treated under special conditions.<sup>16,28</sup>

The present study had some limitations such as the participants/practitioners were from only two cities (Riyadh and Al-Kharj). There is some discrepancy among certain groups like more number of graduate dental practitioners as compared to general medical practitioners. Surveying more cities in the kingdom of Saudi Arabia and increasing the sample size will give a better understanding of the current knowledge and awareness of practitioners in the management of patients on anticoagulant and/or antiplatelet therapy.

#### 5. Conclusion

In this study, both dentists and medical practitioners showed wide range of approach in terms of dental management of anti-coagulated patients. The findings confirm use of traditional or routine practice of dental management for such

patients rather than evidence based practice. The finding from current study suggests that there is a great need to educate both medical and dental practitioners to use evidence based guidelines in terms of dental treatment for patients on anticoagulant and/or antiplatelet therapy.

#### Conflict of interest

The authors declare no conflict of interest.

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