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Original article

Association between satisfaction with and adherence to warfarin therapy on the control of international normalized ratio: A hospital-based study in Saudi Arabia

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ABSTRACT

Background: High satisfaction with, and adherence to, warfarin therapy are linked to better international normalized ratio (INR) control and good therapeutic outcomes.
Objective: This study was conducted to identify the association between satisfaction with, and adherence to, warfarin therapy and the control of the INR within the target therapeutic range.
Methods: A cross-sectional study was conducted from June 1 to August 31, 2016, at the Anticoagulation Clinic in the Cardiology Center at King Fahad Hospital, Qassim, Saudi Arabia. All adult patients included in the study were 18-years-old or older and were on warfarin therapy for 6 months or more. The data were collected through face-to-face interviews using a structured questionnaire.
Results: A total of 298 patients were included. Of them, 194 patients (65.1%) were males and 152 (51.0%) were classified as satisfied with their warfarin therapy. Secondary educational level and above ($P = .001$) and being non-Saudi ($P = .026$) were identified as determinants of a high level of satisfaction. Ninety-five (31.8%) participants were classified as adherent to the therapy, and satisfaction with treatment was the only predictor of adherence ($P = .009$). One hundred thirty-six patients (45.6%) achieved their target INR range. Satisfaction ($P = .038$) and adherence ($P = .023$) were significantly associated with better INR control.
Conclusion: Substantial efforts are needed to improve patient satisfaction and adherence to treatment through different strategies in order to achieve the target therapeutic goal for warfarin treatment.

1. Introduction

Warfarin is a widely used drug for the treatment and prevention of multiple disease states such as atrial fibrillation (AF), venous thromboembolism (VTE), and prosthetic heart valves (Tadros and Shakib, 2010). Despite the fact that the drug was introduced decades ago, it is still considered difficult to use due to its narrow therapeutic range (Jaffer and Bragg, 2003). Both drug efficacy and safety depend on keeping the international normalized ratio (INR) within a target range (Kuruvilla and Gurk-Turner, 2001). An INR below the target range is linked to risk for, and severity of, a stroke; and even an increased risk of mortality (Hylek et al., 2003). Conversely, an INR above the therapeutic range is associated with serious bleeding complications (Garcia et al., 2006). Among patients on warfarin therapy, INR values were found to be out of the target therapeutic range approximately half of the time (Samsa et al., 2000).

It is well-known that vitamin K is antagonistic to warfarin therapy and it can decrease the patient's quality of life and influences the patient's adherence to the treatment (Wild et al., 2008). Poor adherence to warfarin therapy has been documented in the literature (Platt et al., 2010; Kim et al., 2011). Researchers have identified non-adherence to therapy as among the multiple factors that predict poor INR control (Schein et al., 2016).

Frequent laboratory monitoring, fear of side effects, and the psychological impact of treatment influence patient satisfaction with warfarin therapy (Murray et al., 2005). Higher patient satisfaction

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with warfarin therapy was found to be strongly associated with good INR control (Wang et al., 2014). In addition, dissatisfaction with anticoagulation leads to decreased adherence, poorer INR control, and poorer clinical outcomes (Samsa et al., 2004).

Satisfaction with, and adherence to, a warfarin regimen are important factors needed to ensure the optimal therapeutic outcome. In Saudi Arabia, few studies have been conducted to identify the association between these factors and the achievement of INR control. Identifying associations between satisfaction, adherence, and INR control is crucial for developing educational interventions that can improve patient care. Therefore, this study was conducted to identify the association between satisfaction and adherence to warfarine therapy and achievement of INR control

2. Material and methods

A cross-sectional study was conducted during a period of three months (June 1 to August 31, 2016) among patients on warfarin therapy. The study was carried out at the Anticoagulation Clinic in the Cardiology Center at King Fahad Hospital, Qassim, Saudi Arabia. This clinic was established for the monitoring of patients on anticoagulation therapy.

The study included adult patients 18-years-old or older who were on warfarin therapy for six months or more. Each patient had at least six previous INR readings in the medical record and gave verbal consent to participate. Patients incapable of communicating verbally or who refused to give consent were excluded from the study. Patients enrolled in this study were selected using convenience sampling.

The data was collected through face-to-face interviews using a structured questionnaire. The questionnaire was composed of four parts. The first part was designed to collect background data (age, gender, nationality, educational level, marital status, residence, employment status, indication for warfarin use, and duration). The second part measured patient satisfaction with warfarin therapy using the 17-item Anti-Clot Treatment Scale (ACTS). It includes two subscales to measure the burdens and benefit of ACT. The burden subscale contains 13 item (12-items and one global question about the negative impact of ACT on the patient's life). The benefit subscale is a 4-item subscale (including a 3-item and one global question about the positive impact of ACT on the patient's life). This tool was translated into Arabic using Mapi Research Institute guidance, which involved forward and backward translation with pilot testing by Elbur et al. (2015). The patients were asked to rate their experiences with anticoagulant treatment during the past 4 weeks on a 5-point scale of intensity (1 = not at all, 2 = a little, 3 = moderately, 4 = quite a bit, 5 = extremely). Reverse coding was adopted for the calculation of the burden subscale so that higher scores indicated higher satisfaction. The burden subscale score ranged from 12 to 60 and the benefit subscale score ranged from 3 to 15. These subscales created a total range of 15–75 for all 17 items. The patient was considered satisfied with anticoagulant treatment if he/she scored above the mean score for all patients. The patient was considered dissatisfied when scoring below the mean. The third part of the questionnaire assessed medication adherence using the Medication Adherence Questionnaire (MAQ) (Morisky et al., 1986). This scale assesses patient forgetfulness, carelessness, stopping or if they stop the treatment due improvement or worsening of the patient's condition. Patients considered to be non-adherent if they responded positively to at least 1 question.

The last questionnaire was used to collect data on INR readings during the previous consecutive six months. The American Heart Association/American College of Cardiology guidelines were adopted to classify the patients as follows: for all indications an INR from 2 to 3 was considered controlled, except in cases of prosthetic heart valve disease, where the anticoagulation control was be defined as an INR value of 2.5–3.5 (Jaffer and Bragg, 2003; Hasan et al., 2011). For all other values, the patient's INR was considered uncontrolled (Mayet, 2016; Ansell et al., 2008). Good INR control was defined by the Time in Therapeutic Range (TTR) using the Rosendaal method. A TTR of greater than 75% was considered controlled (Rosendaal et al., 1993).

Data were processed by the Statistical Package for Social Sciences (SPSS) version 21. Descriptive statistics were used to describe all variables. Logistic regression analysis was performed to identify predictors (demographic variables) of satisfaction, adherence, and anticoagulation control.

3. Results

A total of 298 patients participated in this study and 194 (65.1%) were males. The majority of the participants, 257 (86.2%), were Saudi and 41.3% were 60-years-old or older. One hundred sixty-four participants (55%) lived in rural areas. The demographic characteristics of the patients are reported in Table 1.

Warfarin was indicated for 111 (37.1%) patients with atrial fibrillation (AF) and 109 (36.5%) patients with mitral valve replacement. A detailed list of the indications for warfarin therapy is presented in Table 2.

Table 3 shows the mean scores of the participants' responses to anti-clot scale. The mean level of satisfaction was 46.0 ± 13.2. Overall, 152 (51.0%) patients were classified as satisfied with the warfarin therapy and 146 (49.0%) patients were not satisfied.

Table 1
Patients' background characteristics.

Characteristic	Frequency (n = 298)	Percentage %
Gender		
Male	194	65.1
Female	104	34.9
Age group in years		
<60 years	175	58.7
≤60 years	123	41.3
Nationality		
Saudi	257	86.2
Non-Saudi	41	13.8
Residence		
Town	134	45
Outside town	164	55
Educational level		
Secondary &above	110	36.9
Below secondary	188	63.1
Marital status		
Married	255	85.6
Single	43	14.4
Occupation		
Working	101	33.9
Not working	197	66.1

Table 2
Indications for warfarin.

Indication	Frequency	Percent
Mitral valve replacement	111	37.2
Atrial fibrillation	109	36.6
Pulmonary Embolism	14	4.7
Deep vein thrombosis	25	8.4
Stroke	9	3.0
Others	30	10.1
Total	298	100

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