ARAŞTIRMA

EVALUATION OF MEDICATION MANAGEMENT SAFETY IN PATIENTS USING ORAL ANTICOAGULANTS

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ABSTRACT

Objective: *This study is planned as a descriptive study in order to identify the safe medication for the individuals who are given oral anti-coagulator treatment.*

Methods: *The population of this research involves the patients who take OAC under observation in the outpatient departments and cardiology policlinics, inpatients in cardiology and coronary intensive care of a university hospital between February 2011 - February 2012. The sample involves 145 patients having the criteria who had an informed consent after being explained the aim of the research. The data is collected by a questionnaire of questions on socio-demographic features, the treatment they take, and their knowledge, attitudes towards OAC The analysis of data is performed on the computer with SPSS 15 package.*

Results: *As a result of this research, the mean age of the individuals is seen as 53.14±13.83 years. It is also found out that about 64.1% of the patients use 5 mg./day of OAC medication, about 40 % have had no training about the medication, about 75.9 % have experienced side effects of bleeding. The mean score of knowledge and attitude of the patients having OAC medication is 3.55±2.01(low) ve 7.42±2.03 (high). It is detected that there is a significant relationship between the mean score of knowledge and age, sex, education level, training and side effect experience (p<0.05). The mean score of attitude is detected to have a significant relationship only with having a medicine management training (p<0.05). Knowledge and attitude mean scores are found out to have a weak but positive significant relationship (p<0.05).*

Conclusions: *It is determined that safe drug management of the patients who take oral anti-coagulator treatment is inadequate and that they require guidance, counselling and training on this subject.*

Key words: *Oral anti-coagulator; medication; safe management; patient*

ÖZET

Oral Antikoagülan Kullanan Bireylerde Güvenli İlaç Yönetiminin Değerlendirilmesi

Amaç: *Bu araştırma oral antikoagülan (OAK) tedavi uygulanan bireylerde güvenli ilaç yönetimini belirlemek amacıyla tanımlayıcı olarak planlandı.*

Yöntem: *Araştırmanın evreni, Şubat 2011 -Şubat 2012 tarihleri arasında bir üniversitenin, eğitim ve araştırma hastanesinin kardiyoloji poliklinikleri, servisleri ve koroner yoğun bakım ünitelerinde takip edilen ve OAK ilaç kullanan bireylerden, örneklemi ise araştırmanın amacı açıklandıktan sonra bilgilendirilmiş izin alınan ve araştırmanın kriterlerini karşılayan 145 hastadan oluştu. Veriler bireylerin sosyo-demografik, sağlık öyküleri ve tedavi ile ilgili özellikleri, OAK tedaviye yönelik bilgi ve davranışlarını değerlendiren sorulardan oluşan anket formu ile toplandı. Verilerin analizi bilgisayar ortamında SPSS 15.0 paket programı ile analiz edildi.*

Bulgular: *Araştırma sonucunda, bireylerin yaş ortalamasının 53,14±13,83 yıl, %64,1'inin günde 5 mg OAK ilaç kullandığı ve %40'ının ilaç konusunda herhangi bir eğitim almadığı, %75,9 'unun kanama yan etkisi deneyimlediği görüldü. OAK ilaç kullanan bireylerin bilgi ve davranış puan ortalamaları 3,55±2,01 (düşük) ve 7,42±2,03 (yüksek)* idi. *Bilgi puan ortalaması ile yaş, cinsiyet, öğrenim durumu, eğitim alma ve yan etki yaşama arasında anlamlı ilişki olduğu (p<0.05), davranış puan ortalamasının ise sadece ilaç konusunda eğitim alma ile anlamlı ilişki gösterdiği (p<0.05) belirlendi. Bilgi ile davranış puan ortalamaları arasında zayıf düzeyde pozitif yönde anlamlı bir ilişki olduğu saptandı (p<01).*

Sonuçlar: *OAK tedavi uygulanan bireylerin güvenli ilaç uygulamalarının yetersiz olduğu ve bu konuda rehberlik, danışmanlık ve eğitime gereksinim duydukları saptandı.*

Anahtar Kelimeler: *Oral antikoagülan; ilaç; güvenli yönetimi; hasta*

INTRODUCTION

Oral anticoagulants (OAC) are drugs that have critical significance on the treatment and prevention of thromboembolic cases. With a

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comprehension of the importance of the thromboembolism treatment of cardiovascular diseases, the use of oral anticoagulants has risen over the last few years. This is especially due to the positive results from the patients in long-term treatment. Effective anticoagulation therapies require systematic and well-organized patient management (Barcellone, Contu and Marongıu 2002; Budnitz, Shehab, Kegle and Richards 2007; Moore, Cohen and Furberg 2007; Sharifi, Vajo, Freeman, Bay, Sharifi and Schwartz 2015; Jaff, McMurtryand and Archer 2011).

Atrial fibrilation, cardiac valve diseases, deep venous thrombosis, cerebral and pulmonary emboli, and many other cardiovascular problems are among the most common indicators that the use of oral anticoagulants is required (Ansell, Hirsh, Dalen, Anderson and Deykin 2001; Hirsh, Fuster, Ansell and Halperin 2003; Jaff, McMurtry and Archer 2011). In addition to the scientific advancements, oral anticoagulant treatments have been widely used before and after the medical and surgical treatments, in order to prevent arterial venous thrombus. Wysowski, Nourjah and Swartz (2007) studied FDA (Food and Drug Administration) and NCHS (National Center for Health Statistics) data in 2007 and reported that the number of oral anticoagulant prescriptions rose by 45% between 1998-2004 in the USA.

OAC types of drugs have side effects that are caused by individual factors, as well as ones caused by the drugs themselves, such as the chemical structure of the drug and its administration duration (Ansell, Hirsh, Dalen, Anderson and Deykin 2001, Khudair and Hanssens 2012). The most common and life threatening side effect that has been seen in patients, who use oral anti-coagulants, is bleeding (Budnitz, Shehab, Kegle and Richards 2007; Rubboli, Becattini and Verheugt 2011). Beyth (2001) and Jeffree, Gordon, Sivasubramaniam and Chapman (2009) have shown that the prevalence of bleeding in the patients taking oral anticoagulants is nearly 50% and that they have described these incidents as potentially fatal intra-cranial bleedings that require 4 or more blood transfusions within 48 hours. In a study which scanned the reports of AERS (Adverse Evert Reporting System), it was found that among the 9,766 patients who were admitted to emergency units with bleeding, between 1993 and 2006 in the USA, 8,415 patients had been using anticoagulants and that 999 of them died (Wysowski, Nourjah and Swartz 2007).

The Prothrombin Time (PT) described using the International Normalized Ratio (INR) should be regularly monitored and the dosage adjusted (Barcellona, Contu ve Marongiu 2002) for an effective therapy. However, the periodical checking of the PT and the related dosage adjustment is not enough to prevent anticoagulant irregularity. It is also necessary to educate the patient on how to management the treatment appropriately, at the beginning of their oral anticoagulant treatment (Barcellona, Contu and Marongiu 2002; Ansell, Hirsh, Dalen, Anderson and Deykin 2001) This education must contain the indications, risks, and benefits of oral anticoagulants, methods of administration, dietary restrictions and interactions, and the importance of the influence of other drugs and inter-current diseases (Barcellona, Contu and Marongiu 2002; Estrada, Hryniewicz, Higgs, Collins and Byrd 2000). Physicians and nurses are the ones who are responsible for this education, aiming to prevent side effects and to sustain a safe treatment (Gadisseur, Breukink, Meer, Basselaar, Sturk and Rosendaal 2003; Porter 2002; Bajorek, Ogle, Duguid, Shenfield and Krass 2007).

The incorrect administration of OAC drugs may cause life-threatening problems, or the patient may not benefit from using the drug (Acaroğlu ve Şendir 2001; Bhavnanı and Shıach 2002). This descriptive study aimed to determine patients' knowledge and practices of the safe use of medicine in their using oral anticoagulant treatment. There was no study in Turkey evaluating the safe management of OAC drugs when this study was first started.

METHODS

The Design, Universal and Sample: This descriptive research was conducted at the cardiology policlinics, inpatients in cardiology and coronary intensive care of a university hospital, Turkey between February 2011-February 2012. 145 patients that accepted to join the research composed the sample group. Inclusion criteria included the following: (i) using oral anticoagulant drug, (ii) able to communicate Turkish, (iii) agree with the participate in the study.

The Instrument: A two-part structured questionnaire was used to collect data. The first part included questions on the patients' socio-demographics, medical history and their treatment behaviour. The second covered

questions designed by the researchers considering the literature to evaluate the OAC patients' knowledge and practices towards therapy. They are required to answer these questions either "yes" or "no". In order to evaluate their level of knowledge and practices a questionnaire of 10 questions asking about such as the effects of OACs, what to do when they forget to take the drug, the interactions between OACs and food, drugs, and herbal products, the issues that have to be taken into consideration about clothing, their hygene, and whether or not they know about the increased importance of avoiding physical injuries, was applied to the patients. They got 1 point for each answer they got right and 0 point for the ones they did not (Khudair and Hanssens 2012; Bajorek, Ogle, Duguid, Shenfield and Krass 2007; Mercan ve Enç 2010; Ansell, Hirsh, Hylek, Jacobson, Crowther and Palareti 2008; Yaka, Pekdemir, Yilmaz ve Akalın 2011).

The score for the practices was obtained with these questions regarding six types of behavior; administration of the drug everyday at the same hour (yes:2 points, no: 0 point), visiting the doctor regularly, the frequency of INR analysis (once a week/month: 2 pts., once a year/irregularly: 0 pt.), stating the usage of anticoagulant (Coumadin) on hospital or health center admission (yes: 2 pts., no:0 pt.), using herbal remedies (yes:0 pt., no:1 pt.) and taking painkillers with OACs (yes:0 pt., no:1 pt.). The score ranged between 0 and 10. It was assumed that the higher the score was, the more reliable OAC treatment would be.

Data Collection: Necessary correspondences were achieved between the executive units and official consent was obtained prior to the data collection. The outpatients in cardiology policlinics, inpatients in cardiology and coronary intensive care units and the ones having anticoagluant administration were determined. Patients appropriate for the sample criteria were informed about the aim and content of the research, expectations from them and their rights. After getting informed consent of the volunteering patients, data was collected by face to face interviews in twelve months time.

Data analysis: Data was analysed using SPSS-15.0 (Statistical Package for Social Sciences). Numbers, percentages, arithmetic means, and standard deviations were used as descriptive statistics. Spearman correlation analysis was used for associations between numeric variables.

Ethical Considerations: Ethical consent was obtained from the Ethical Committee, Sakarya University, written consents from relevant institutions. The questionnaires were filled out by the researcher through interviews after proper patient information.

FINDING AND DISCUSSION

OAC drugs should be taken carefully and followed regularly, because of their side-effects. Their safe management is closely related with the patients' knowledge and awareness on this issue (Acaroğlu ve Şendir 2001; Ansell, Hirsh, Dalen, Anderson and Deykin 2001). The efficiency and accomplishment of the long term OAC treatment depends on the patient taking the treatment seriously and adopting the behaviors essential for the treatment (Ansell, Hirsh, Dalen, Anderson and Deykin 2001; Sharifi, Vajo, Freeman, Bay, Sharifi and Schwartz 2015). In a study performed by Palareti et al. (2005), it was expressed that the response to oral anticoagulant treatment may vary and that the biggest variance may stem from the patients' comprehension of the importance of the treatment.

The mean age of the patients was 58.14±13.83 (range 20-85). Nearly half of the patients who participated in the study were between 41-64 years old (52.4%) and women (54.5%). More than half of these participants were educated in primary level (58.6%) and most of them were married (74.5%).

When the medical histories of the patients were examined, it was shown that half of them (51%) used OAC drugs for 1-5 years (all of them used Coumadin), nearly one third of them (39.3%) had a chronic disease other than the ones that require OAC drugs, and the mean dose of their drugs was 5.71±2.41mg/day. 17.9% of the patients declared that they didn't know the reason why they were using OAC drugs. Nearly half of them (40%) were found to have no education on the management of their drugs. More than three fourths of the patients in the sample group (75.9%) had bleeding. 110 of these patients were examined and it was found that 23.4% had severe bleeding drug that may cause death, such as bleeding in the brain, lungs, stomach, bowels, etc. (Table 1). The fact that the patients' needs of education were not satisfied is compatible with the literature and the results of the studies (Porter 2002; Uzun ve Arslan 2007; Yaka, Pekdemir, Yilmaz ve Akalın 2011). A significant finding in this study was that most of the patients have experienced bleeding. Wysowski, Nourjah and Swartz (2007) also

found that of the 9766 patients admitted to the emergency units with bleeding, 8415 used anticoagulants. Bleeding is the major complication of OACs; the patient must stop using the medications and see a doctor immediately (Gadisseur, Breukink, Meer, Basselaar, Sturk and Rosendaal 2003; Beyth 2001).

Tablo 1. Patients' social-demografic and medical history by duration of OAC using (n=110)

Medical History	**n**	**%**
Duration		
>1 Year	29	20.0
1-5 Years	74	51.0
6-10 Years	31	21.4
11-16 Years	11	7.6
Other diseases		
Yes	57	39.3
No	88	60.7
Mean dose of OAC (mg/day)	(5.71±2.41)	(Min=2.5 Max=10)
Reason for therapy		
Known	119	82.1
Unknown	26	17.9
Educated about medication management		
Yes	87	60.0
No	58	40.0
Bleeding		
No	35	24.1
Yes	110	75.9
Severity of bleeding*		
Minor (Skin/Nasal/Dental bleeding)	76	52.5
Major (Brain/Lungs/Stomach/Hematuria)	34	23.5

It was found out that the knowledge score means of the patients on OAC management were low (3.55±2.02) (Table 4). The highest rates of correct answers to the questions were; a total of 74.5% for the question "OAC drugs have effects like blood dilution", a total of 71% for the question "One should refrain from physical injuries (bumps, cuts or falling down)" and a total of 70.3% for the question "Two doses may be taken together when forgotten." The lowest rates were 12.7% for the question "OAC drugs may have different effects when taken with some herbal products" and 11.7 % for the question "Some food may change the effects of OAC drugs" (Table 2).

In a study by Campbell and Sefton (2010) patient achievement of OAC drug management at home was assessed. On their visits to the 36 discharged patients they saw that most of these patients (92%) knew what OACs were used for; however, only 33% of them knew that they shouldn't take two doses at once if they skipped one. The fact that OACs interact with other drugs or some type of food may affect its safe use by changing the expected therapeutic effect. In order to prevent patients facing unexpected side effects, they should be informed beforehand. These findings have corresponded with the literature and supported the need of education for safe drug management (Ansell, Hirsh, Hylek, Jacobson, Crowther and Palareti 2008; Kuhn 1994; Mercan ve Enç 2010; Yaka, Pekdemir, Yilmaz ve Akalın 2011).

It was found out that most of the patients gave incorrect answers to the questions aiming to determine the effect of OACs on daily activities. The percentages were; "They should refrain from physical injuries such as bumps, cuts, etc. and that they shouldn't take two doses at once when they skip a dose (70.3%)". The percentage of patients was lower who knew the importance of an appropriate toothbrush, to prevent gum bleeding (46.2%), appropriate sports activities (38.6%), and using shaving machines instead of razors (29.7%) and appropriate clothing (13.1%). In addition, very few of the patients were aware of the interaction between OAC drugs and other drugs (16.6%), herbal products (12.4 %) and food (11.7%) (Table 2).

Table 2. Patients' knowledge of OACs (n=110)

Knowledge of OAC therapy	**Yes**		**No**	
	N	**%**	**N**	**%**
OACs have effects including blood dilution	108*	74.5	37	25.5
Physical injuries should be avoided	103*	71.0	42	29.0
Two doses may not be taken at once	43	29.7	102*	70.3
Toothbrush should be used to prevent bleeding	67*	46.2	78	53.8
Appropriate exercise (e.g. swimming) should be chosen	56*	38.6	89	61.4
Shavers should be preferred	43*	29.7	102	70.3
OACs may contraindicate if taken with other drugs	24*	16.6	121	83.4
Clothing/footwear are important for subcutaneous bleeding	19*	13.1	126	86.9
OACs may react with herbals	18*	12.4	127	87.6
Foods may alter the effects of OACs	17*	11.7	128	88.3

Most of the patients were aware of the side effects, high bleeding-risk injuries to avoid, and that missed doses should be skipped, but were unaware that they should not wear tight clothes and footwear that could cause subcutaneous bleeding, hard toothbrushes could cause gum bleeding, they should prefer shavers to razors, and swimming is the safest activity. They were also uninformed that OACs could interact with foods and herbals, which could change the therapeutic effects. The findings supported previous studies (Barcellona, Contu ve Marongiu 2002; Mercan ve Enç 2010; Campbell and Sefton 2010).

The mean score of the practices that show compliance to the treatment for the patients having OAC treatment were seen to be (7.42+2.03). The highest level of correct behaviour was in OAC regular drug administration (81.4%), Informing the physician about OAC usage (86.9%) and not using herbal remedies (79.3%); while the least correct behaviour was taking painkillers with OACs (55.2%). (Table 3). Previous studies showed that the patients were regularly taking medications, having INR tests, and seeing the physician regularly (Khudair, and Hanssens 2012; Bajorek, Ogle, Duguid, Shenfield and Krass 2007; Mercan ve Enç 2010).

The study noted that most patients took their drugs daily and regularly, had INR tests, visited their physicians, and when they were presented with other health problems, they informed the physician about their usage of the OACs.

Previous studies showed that OAC patients have positive behavior towards regular medication administration, INR tests and doctor visits (Jones, McEwan, Morgan, Peters, Goodfellow and Currie 2005.; Ansell, Hirsh, Hylek, Jacobson, Crowther and Palareti 2008; Mercan ve Enç 2010; Hirsh, Fuster, Ansell and Halperin 2003; Beyth 2001; Mitchell 1998).

When the correlation between knowledge score mean and practices score mean were examined, it was seen that there was a slightly positive significant correlation between knowledge and practices score means. The higher knowledge score mean, the higher practices score mean. ($p<0.05$; Tablo 4).

Table 3.Patients' OAC therapy practices (n=110)

Practice	**n**	**%**
OAC management		
Regular	118	81.4
Irregular	27	18.6
INR testing		
Regular	114	78.6
Irregular	31	21.4
Physician visits		
Regular	114	78.6
Irregular	31	21.4
Informing physician on OAC usage		
Yes	126	86.9
No	19	13.1
Use of herbals		
Yes	30	20.7
No	115	79.3
Taking painkillers with OACs		
Yes	80	55.2
No	65	44.8

Table 4. Correlation between mean knowledge and practices scores of patients on OACs.(n:145)

Level of knowledge and practices on OAC usage	$\bar{x}$ ±SS	r	p
Knowledge	3.55±2.01	.24*	0.004
Practices	7.42±2.03		

*Pearson correlation analysis

For a long term safe OAC management, its effectiveness and patient's maintenance of present life standards, it is essential that s/he had attained and internalized the necessary attitudes that would help her/him develop a positive response to the treatment. In order to detect the correlation between the knowledge and practices of participants towards OAC treatment, their mean scores were examined and seen that there was a slightly positive significant correlation between their knowledge and attitude scores (p>.05, table 4). The fact that partcipants have a low mean score on knowledge (3.55±2.01; Tablo 4) but a high mean score on attitude (7.42±2.03; Tablo 4), and still most of them experience side effects show that there is no conscious attitude change.

Most of the patients (79.3%) do not use herbal remedies together with OACs, which is an appropriate behaviour. However, the low number of patients who are aware that OACs interact with herbal remedies express that this attitude is not knowledge based. Ouirke, Cahill, Perera and Conway (2007) have stated that bleeding, which is the most severe complication of OACs, is substantially (43%) due to drug interaction. In our study, the high rate of taking painkillers alongside with OACs (55.2%) was considered as a dangerous condition in view of side effects, which showed compliance with the literature (Ouirke et al 2007; Gadisseur, Breukink, Meer, Basselaar, Sturk and Rosendaal 2003;; Bhavnani and Shiach 2002).

Findings of the research suggested that the sample group needed education using safe medicine management, judged by their knowledge and attitudes on OAC treatment.

CONCLUSION

The results showed that the patients forming the sample group needed guidance, counseling, and education on drug management in order to prevent life-threatening side effects such as severe bleeding. The patients using OACs should be supported by physicians, nurses, and clinical pharmacists at the beginning of the treatment so that they can manage the treatment safely. The implementation of a planned training program to satisfy their needs would contribute to get preventable side effects under control and thus by achieving safe medicine management to contribute to the life standards of patients. As for the patients, it would be better to give them booklets as a source of reference, whenever they need help. In addition, the patients should be observed at regular intervals in order to evaluate their compliance with the treatment and to get the unwanted effects under control before it is too late.

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