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ffect of patients' warfarin adherence on anticoagulation control

Efecto de la adherencia a la warfarina de los pacientes sobre el control de la anticoagulación

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Abstract

Objectives: To evaluation patients' adherence about warfarin therapy and to find out the relationship between patients' adherence and anticoagulant control

Methodology: A descriptive study was carried out at Ibn Al-Bitar Specialized center for Cardiac Surgery for the period between between October 28, 2022.until May 28,2023. A non-probability sampling was used among (210) patients with cardiovascular disease. The study instrument used to collect data was composed of two parts namely: sociodemographic characteristics included (7) questions , patient's adherence regarding warfarin therapy consists of (11) questions,.Data were analyzed using IBM SPSS version 26. Descriptive and inferential data analysis were utilized to summarize the results.

Results: The study indicated that patients had partial adherence (70%) about warfarin Therapy.

Conclusions: There are significant relationship between patient's adherence and anticoagulant control

Keywords: adherence, warfarin therapy, anticoagulant control.

Resumen

Objetivos: Evaluar la adherencia de los pacientes al tratamiento con warfarina y conocer la relación entre la adherencia de los pacientes y el control anticoagulante.

Metodología: Se realizó un estudio descriptivo en el centro Especializado en Cirugía Cardíaca Ibn Al-Bitar durante el período comprendido entre el 28 de octubre de 2022 y el 28 de mayo de 2023. Se utilizó un muestreo no probabilístico entre (210) pacientes con enfermedad cardiovascular. El instrumento de estudio utilizado para recopilar datos estuvo compuesto por dos partes, a saber: características sociodemográficas incluidas (7) preguntas, la adherencia del paciente con respecto a la terapia con warfarina consta de (11) preguntas. Los datos se analizaron utilizando IBM SPSS versión 26. Se realizaron análisis descriptivos e inferenciales de datos. utilizados para resumir los resultados.

Resultados: El estudio indicó que los pacientes tenían una adherencia parcial ((70%) al tratamiento con warfarina.

Conclusiones: Existe relación significativa entre la adherencia del paciente y el control anticoagulante.

Palabras clave: adherencia, terapia con warfarina, control anticoagulante.

Cardiovascular disease (CVDs) is a class of diseases that involve the blood vessels or heart. CVDs are the major cause of deaths globally every year. CVD arising from atherosclerosis will be the main cause of death in the worldwide and its represent the common cause of cardiovascular disease. As per 2019 census, approximately 17.9 million people have died from CVDs alone at the global level, which accounts for 32% of deaths worldwide¹⁻⁸. Patients with CVDs receive oral anticoagulation therapy for conditions such as cardiac thromboembolism, severe left ventricular dysfunction, mechanical heart valves, and bioprosthetic heart valves. Oral anticoagulants such as warfarin was used to manage these conditions clinically⁹⁻¹¹.

Warfarin has been the mainstay oral anticoagulant agent for the last several decades despite its narrow therapeutic index and difficulties to use¹². Warfarin most commonly prescribed oral anticoagulant therapy in the United States¹³. This has led to a dramatic increase in the number of patients receiving warfarin therapy and those who are referred to anticoagulation clinics¹⁴.

Patients treated with warfarin should be closely monitored to detect and prevent serious problems may occur, Missed doses decrease the efficacy of the medication, and overdoses cause various adverse effects^{15,16}. The goal of warfarin therapy is to decrease the clotting tendency of blood, but not to prevent clotting completely. Therefore, the blood's ability to clot must be carefully monitored while a person takes warfarin. The dose of warfarin is adjusted, based on the results of periodic blood tests of prothrombin time (PT) and International Normalized Ratio (INR) to maintain the clotting time within a target range¹⁷. In most cases, the therapeutic INR range is 2.0–3.0. Exceptional cases can be when warfarin is being used for prevention following a myocardial infarction or in individuals with severe-risk mechanical prosthetic heart valves, in whose circumstance the range is 2.5–3.5. The rise in INR across the therapeutic range bestows a predisposition to bleeding, which would be a frequent cause of hospitalization¹⁸.

The risk of mortality and morbidity in patients with cardiac disease increases if adherence to prescribed medication is poor. Moreover, non-adherence to warfarin therapy is linked to a more variable anticoagulation control. Studies demonstrated that poor adherence was potentially a major source of poor anticoagulation control while other studies. Stated that Adequate adherence was significantly associated with good anticoagulation control^{19,20,15}. up to 92% of the

patients could not adhere to warfarin therapy and had under anticoagulation control. For each 10% increase in non-adherence to warfarin, there was a 14% increase in the risk of under-anticoagulation and caused significantly higher rates of morbidity and mortality²¹.

The most determining factor in the success of warfarin therapy is patients' adherence to the treatments. Studies have shown a, higher adherence, better knowledge and lower apprehension to warfarin therapy is associated with significantly better INR control^{22,23}.

An association between patients' adherence and anticoagulation control has not been well researched in Iraq. Evaluation of current patient Adherence and Anticoagulant control is the first step to improving the quality of anticoagulation therapy and patient care. Objectives of this study to assess patient Adherence and Anticoagulant control regarding warfarin among patients with cardiovascular disease and to find out the association between patient Adherence and their Anticoagulant control.

Materials and methods

Study Design:

This is a quantitative institutional based study. descriptive study was conducted between October 28, 2022. to May 28, 2023.

Study Setting:

This study was conducted at Ibn Al-Bitar Specialized center for Cardiac Surgery, a government center in (Baghdad /Iraq).

Study Sample:

A non-probability sampling of (210) patients with cardiovascular disease.

Ethical Considerations:

The ethical approval was obtained from the Scientific Research Ethical Committee at College of Nursing-University of Baghdad. The researcher obtained written consent from every patient prior to data collection. The researcher explained the study's overall purpose and how to complete the questionnaire to the study participants and their data would be kept private and safe during and after their participation in the study.

Instrument of the study:

The instrument comprising 18 questions in two parts: first part was sociodemographic characteristics which included (7) questions; The second part was General Medication Adherence Scale (GMAS) which consists of (11) item. Each item has 4 outcomes and awards an adherence score. The total score that could be achieved is 33. Sum of all items yields a final score that is interpreted in various levels of adherence; high

(30–33), good (27–29), partial (17–26), low (11–16), and poor (10) .

To assess the anticoagulation control, the most recent consecutive three INR readings, over 3 months period of time .Anticoagulation control was defined as INR between (2-3) for all indications except for mitral valve replacement (2.5–3.5): Good INR control was defined as percent Time INR in Therapeutic Range (TTR) 70% during study period using the Rosendaal method²⁴. This method adds each patient’s TTR and divides it by the total times of observations.

After calculating TTR of each patient, the level of anticoagulation control was determined using the following cut off values

- Good control : TTR > 70%
- Intermediate control : TTR 50 -70 %
- Poor control : TTR <50%

The copyright owner has granted the researcher permission to use this scale via email

Validity and reliability of the tools:

The validity of questionnaire was introduced to a panel of (12) experts who had more than 10 years of experience in their field and the reliability of the questionnaire was determined through a pilot study by collecting data from 21 at Ibn Al-Bitar Specialized center for Cardiac Surgery and questionnaire complete answer which takes approximately 10-15 minutes for each sample.

Statistical data analysis:

The data was analyzed using spss by applying the statistical analysis system version 26, and the descriptive and educational statistical data analysis approach was used, which includes:

Descriptive data analysis (frequencies and percentage (%), mean and standard deviation) and inferential data analy.

Results

Table (1): Distribution of Patients according to their Socio-demographic Characteristics

No.	Characteristics	Sample		
		F	%	
1	Age (Year) M±SD=48.3 ± 11.7	Less than 20	3	1.4
		20 – less than 30	17	8.1
		30 – less than 40	20	9.5
		40 – less than 50	58	27.7
		50 – less than 60	74	35.2
2	Gender	60 and more	38	18.1
		Total	210	100
		Male	87	41.4
		Female	123	58.6
3	Level of education	Total	210	100
		Read & write	55	26.2
		Primary school	80	38.1
		Intermediate school	37	17.6
		Secondary school	21	10
		Diploma	8	3.8
		University	9	4.3
4	Occupation	Total	210	100
		Unemployed	134	63.8
		Worker	26	12.4
		employee	29	13.8
		Retired	21	10
5	Marital status	Total	210	100
		Single	11	5.2
		Married	190	90.5
		Widowed/er	6	2.9
		Divorced	3	1.4
6	Residency	Total	210	100
		Rural	11	5.2
		Urban	190	90.5
		Suburban	9	4.3
7	Monthly income	Total	210	100
		Insufficient	153	72.9
		Barely sufficient	44	21
		Sufficient	13	6.2

No: Number, f: Frequency, %: Percentage, SD: Standard deviation

Table shows that average age for patients is 48.3 ± 11.7 year and the highest percentage is seen with age group of “50-less than 60 year” among 35.2% of them, 58.6% of patients are females and 41.4% of them are males.

Regarding marital status, the majority of patients are married (90.5%) and only 5.2% of them are still unmarried. The residency refers that majority of patients are resident in urban as seem among 90.5%.

Regarding level of education, the highest percentage refers to 38.1% among patients who graduated from primary schools and 26.2% among those who are read and write.

The occupational status shows that 63.8% of patients are either jobless or housewives and only 12.4% are still working as governmental employee.

Concerning monthly income, 72.9% of patients perceive insufficient monthly income.

Table 2: Overall Assessment of Patients' Adherence to Warfarin Medications:

Adherence	f	%	M	SD	Assessment
Poor	51	24.3	14.20	5.031	Partial adherence
Partial	147	70			
Good	12	5.7			
Total	210	100			

f: Frequency, %: Percentage

M: Mean for total score, SD: Standard Deviation for total score

Poor= 0 – 11, Partial= 11.1 – 22, Good= 22.1 – 33

This table manifests that more of patients (70%) are partially adhere to warfarin medication ($M \pm SD = 14.20 \pm 5.031$) and 24.3% show poor adherence to warfarin medication.

Table 3: Assessment of Time in Therapeutic Range (TTR) of Warfarin Treatment for Patients with cardiovascular Disease.

TTR	F	%	M	SD	Assessment
Poor control	128	61	2.39	.824	Poor
Intermediate	36	17.1			
Good control	46	21.9			
Total	210	100			

f: Frequency, %: Percentage

M: Mean, SD: Standard Deviation

Poor= TTR <50%, Intermediate= TTR 50 -70 %, Good= TTR > 70%

This table reveals that patients have poor control regarding warfarin treatment as seen among 61% of them.

Table 3: Relationships among Patients' adherence about Warfarin therapy and their anticoagulant control (N=210)

TTR Variables	Spearman correlation	p-value
Adherence	.370**	.001

** Correlation is significant at the 0.01 level (2-tailed).

This table shows that there is high significant relationship (strong positive) among TTR and patients' adherence to medication at p-values= .001.

The study's findings showed that the majority of the study group's age range, between 50- <60 years old, saw the highest percentage of participants. (35.2%), per age group. This finding is supported by the study, which was conducted in Specialized-Medical Hospital at Mansoura University with patients the majority of patients were age average from 50-<60 years old. (76%) per age group²⁵.

With regarding to gender, the study's findings showed that 58.6% of the study group's participants were female. According to the study's findings, this result is agreed the studies carried out in Libya and Vietnam, Iraq, 66.7%, 56.4%, 54% respectively of patients were female²⁶⁻²⁸.

As for as the educational status, the study finding displayed that majority of study group patients were Primary School indicated that majority of sample are (38.1%). this result is agreed the studies is carried-out in China and Iraq the majority of patients were Primary School 74.47%25.3 repectively^{13,29}.

.As for as the occupational status, the study finding displayed that majority of sample are (63.8%) study group patients were worker. This result is agreed the study is carried-out in Iran, the majority of patients were Self employed 70.4%²⁹.

As regards marital status, the study found that most patients were married, and they are accounted (90.5%). This result is agreed the studies carried-out in Saudi Arabia and Indonesia, Iraq revealed that the majority of patients were married 80%, 89,19%, 57.3%, respectively³¹⁻³³.

As for as residency, the study found that most patients werefrom urban, and they are accounted (90.5). This result is agreed the study carried-out in Saudi Arabia and Iraq revealed that the majority of patients were from urban (83.7%), (77.2%), respectively^{29,34}.

As for as the Monthly income, the study finding displayed that majority of sample are (72.9%) study patients is Insufficient. this result is agreed the study is carried-out in Al-Najaf City, the majority of patient's low income³⁵.

Regarding the overall assessment of patients' adherence The study's findings showed that the study group's was have few patients had high adherence to warfarin therapy (5.7)%, and (70%) Partial adherence. This results congruent with studies carried out in Vietnam and Belgium which reported that a few patients had high adherence to warfarin therapy^{36,37}.

In the researcher's point of view, patients' non-adherence to medication regimens might be related to poor health literacy and lack of comprehension of

treatment benefits, the occurrence of undesired side effects, and the cost of prescribed medicine. Patients' non-adherence to medication regimens increase risk for thromboembolic complications.

Regarding to the relation between total Adherence of the studied patients and their INR control the study result was found that there is statistically positive significant correlation between the Adherence and their INR control. This result is in agreement with studies carried out in USA and Qatar respectively, which reported that revealed statistically positive significant correlation between the adherence and their INR control^{38,39}.

Conclusions

According to the study findings, the study concluded that the level of patients' adherence to warfarin therapy for patient with cardiovascular disease was low, level of patients' coagulant control to warfarin therapy for patient with cardiovascular disease was poor and there are significant relationships between patient's adherence and anticoagulant control.

Substantial efforts are needed urgently in our clinic to develop and implement intervention program to upgrade patients' knowledge and motivating the patients adherence treatment that result in improvement health outcome.

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