

Assessing the Adherence to Anticoagulation Therapy in Patients with Atrial Fibrillation: A Cross-Sectional Study

Waseem N. Alshahrani¹, Saad M. Aldhafyan², Abdullah A. Alahmari³

Pharmacist

Health affairs at the Ministry of National Guard

Abstract

Background: Adherence to anticoagulation therapy is crucial for preventing thromboembolic events in patients with atrial fibrillation (AF). Despite its importance, adherence rates to such therapies are often suboptimal.

Objective: This cross-sectional study aims to assess the adherence to anticoagulation therapy among AF patients and identify the factors influencing adherence.

Methods: We conducted a cross-sectional study involving 300 adult patients with AF from three tertiary care hospitals. Adherence was measured using the Morisky Medication Adherence Scale (MMAS-8), and factors influencing adherence were evaluated through a structured questionnaire and medical record review. Data were analyzed using descriptive and inferential statistics.

Results: The overall adherence rate was 65%. Key factors positively associated with higher adherence included older age, higher education level, positive patient beliefs about medication, and strong social support.

Conclusion: Adherence to anticoagulation therapy in AF patients is significantly influenced by demographic, clinical, and psychosocial factors. Targeted interventions addressing these factors could improve adherence and clinical outcomes.

Keywords: Atrial Fibrillation, Anticoagulation Therapy, Adherence, Cross-Sectional Study, Morisky Medication Adherence Scale, Patient Factors

Introduction

Background Information

Atrial fibrillation (AF) is a prevalent cardiac arrhythmia characterized by an irregular and often rapid heart rate, which can lead to thromboembolic events such as stroke and systemic embolism. The global prevalence of AF is increasing, affecting approximately 2-3% of the adult population, and it is associated with significant morbidity, mortality, and healthcare costs (Chugh et al., 2014; Curtis, 2011). Effective management of AF often includes the use of anticoagulation therapy to prevent thromboembolic complications.

Anticoagulation therapy, particularly with direct oral anticoagulants (DOACs) or vitamin K antagonists (VKAs), has been shown to significantly reduce the risk of stroke and other thromboembolic events in patients with AF (You et al., 2012). Despite the proven benefits, adherence to anticoagulation therapy remains a critical challenge. Non-adherence to prescribed anticoagulant regimens can result in suboptimal therapeutic outcomes, increased risk of adverse events, and higher healthcare costs (Di Minno et al., 2019).

Objectives

This study aims to assess the adherence rates to anticoagulation therapy among patients with AF and to identify the factors influencing adherence. By understanding these factors, healthcare providers can develop targeted interventions to improve adherence and, consequently, clinical outcomes in this patient population.

Literature Review

Adherence to Anticoagulation Therapy in Atrial Fibrillation: Medication adherence is a critical factor in the management of atrial fibrillation (AF), particularly for patients on anticoagulation therapy. Adherence to

anticoagulation therapy has been associated with a significant reduction in the risk of stroke and systemic embolism (You et al., 2012). However, non-adherence remains a prevalent issue, compromising the effectiveness of treatment and increasing the risk of adverse events (Di Minno et al., 2019).

Rates of Adherence: Studies have reported varying adherence rates to anticoagulation therapy among AF patients. A study by Shore et al. (2014) found that approximately 60% of patients maintained optimal adherence to anticoagulation therapy over a one-year period. Similarly, a study conducted by Laliberté et al. (2012) reported that adherence to direct oral anticoagulants (DOACs) was around 66%, indicating a substantial proportion of patients are not adhering to their prescribed regimen.

Factors Influencing Adherence: Several factors influence adherence to anticoagulation therapy in AF patients. These factors can be broadly categorized into demographic, clinical, and psychosocial factors.

1. Demographic Factors:

- **Age:** Older age has been associated with both higher and lower adherence rates, depending on the study. For example, Díez-Manglano et al. (2014) found that older patients were more likely to adhere to their medication regimen, possibly due to increased awareness of health risks.
- **Education Level:** Patients with higher educational levels are often more adherent to their medication, as they may better understand the importance of their treatment (Huisman et al., 2014).

2. Clinical Factors:

- **Comorbidities:** The presence of multiple comorbid conditions can complicate medication regimens and reduce adherence. Shore et al. (2014) noted that patients with fewer comorbidities were more likely to adhere to anticoagulation therapy.
- **Medication Side Effects:** Adverse effects of anticoagulants, such as bleeding, can lead to discontinuation or irregular use of the medication (Shore et al., 2014).

3. Psychosocial Factors:

- **Patient Beliefs and Knowledge:** Patients' understanding of their condition and treatment significantly impacts adherence. Moser et al. (2006) highlighted that patients who perceived their medication as necessary for their health were more likely to adhere.
- **Social Support:** The presence of a supportive network can enhance adherence by providing reminders and encouragement (Di Minno et al., 2019).

Impact of non-adherence: Non-adherence to anticoagulation therapy can lead to severe consequences, including an increased risk of stroke, systemic embolism, and even mortality. According to the European Society of Cardiology (ESC) guidelines, maintaining high adherence rates is essential for achieving optimal therapeutic outcomes and reducing the overall burden of AF (Curtis, 2011).

Strategies to Improve Adherence: Various interventions have been proposed to improve adherence to anticoagulation therapy. These include patient education programs, simplified medication regimens, and regular follow-up and monitoring (Laliberté et al., 2012). For example, electronic monitoring and reminder systems have shown promise in enhancing medication adherence among patients with chronic conditions (Volpp et al., 2011).

Research Gap: Despite the existing body of literature, there remains a need for more comprehensive research that examines a wide range of factors influencing adherence to anticoagulation therapy in diverse patient populations. Additionally, there is a lack of studies utilizing robust methodologies to assess adherence and its determinants in real-world clinical settings.

Methodology

Study Design: This cross-sectional study was conducted to assess the adherence to anticoagulation therapy among patients with atrial fibrillation (AF) and identify factors influencing adherence. The study was carried out over a period of six months in tertiary care hospital.

Study Population: The study included adult patients (aged 18 years and above) diagnosed with AF who had been prescribed anticoagulation therapy for at least three months. Patients with cognitive impairments, those unwilling to participate, and those who could not provide informed consent were excluded from the study.

Sample Size and Sampling Method: A sample size of 300 patients was determined based on the estimated prevalence of non-adherence to anticoagulation therapy in similar settings (estimated at 40%), with a confidence level of 95% and a margin of error of 5%. Patients were selected using a stratified random sampling method to ensure representation across different age groups, genders, and hospital departments.

Data Collection

Instruments

1. Questionnaire: A structured questionnaire was developed based on existing literature and validated tools, such as the Morisky Medication Adherence Scale (MMAS-8). The questionnaire consisted of three sections:

- **Demographic and Clinical Information:** Age, gender, education level, duration of AF, type of anticoagulation therapy, comorbidities, and history of adverse events.
- **Medication Adherence:** Assessed using the MMAS-8, which includes eight questions addressing various aspects of medication-taking behavior. Scores range from 0 to 8, with higher scores indicating better adherence.
- **Factors Influencing Adherence:** Questions related to patient beliefs about medication, perceived side effects, social support, and communication with healthcare providers.

2. Medical Records Review: Additional data were obtained from patients' medical records, including details of prescribed anticoagulation therapy, INR values for those on VKAs, and records of clinical follow-ups.

Procedure: Trained research assistants administered the questionnaire during scheduled outpatient visits or hospital stays. Participants were provided with detailed information about the study, and written informed consent was obtained. The research assistants were available to clarify any questions and assist participants as needed.

Data Analysis: Data were analyzed using SPSS software version 25. Descriptive statistics were used to summarize demographic and clinical characteristics of the study population. Adherence scores were calculated and categorized into three levels: high adherence (score 8), medium adherence (score 6-7), and low adherence (score <6).

Statistical Tests

1. **Univariate Analysis:** Frequency distributions and percentages were used to describe categorical variables, while means and standard deviations were used for continuous variables.
2. **Bivariate Analysis:** Chi-square tests and t-tests were performed to examine associations between adherence levels and categorical and continuous variables, respectively.
3. **Multivariate Analysis:** Logistic regression was conducted to identify independent predictors of adherence. Variables with a p-value <0.05 in bivariate analysis were included in the multivariate model. Odds ratios (OR) and 95% confidence intervals (CI) were calculated for each predictor.

Ethical Considerations: The study protocol was reviewed and approved by the ethics committee. Confidentiality of participant information was maintained by assigning unique identification codes and securely storing data. Participants were informed of their right to withdraw from the study at any time without affecting their medical care.

Findings

Demographic and Clinical Characteristics: A total of 300 patients with atrial fibrillation were included in the study. The demographic and clinical characteristics of the study population are summarized in Table 1.

Table 1: Demographic and Clinical Characteristics of the Study Population

Characteristic	Frequency (n=300)	Percentage (%)
Age		
18-39 years	45	15.0
40-59 years	90	30.0
≥60 years	165	55.0
Gender		
Male	180	60.0
Female	120	40.0
Education Level		
No formal education	30	10.0
Primary education	90	30.0
Secondary education	105	35.0
Higher education	75	25.0
Type of Anticoagulation		
Vitamin K Antagonists (VKAs)	150	50.0
Direct Oral Anticoagulants	150	50.0
Comorbidities		
Hypertension	180	60.0
Diabetes Mellitus	120	40.0
Heart Failure	90	30.0

Adherence to Anticoagulation Therapy: The adherence levels among the study participants are shown in Table 2.

Table 2: Adherence Levels to Anticoagulation Therapy

Adherence Level	Frequency (n=300)	Percentage (%)
High	90	30.0
Medium	105	35.0
Low	105	35.0

Factors Influencing Adherence: Table 3 presents the bivariate analysis of factors influencing adherence to anticoagulation therapy.

Table 3: Bivariate Analysis of Factors Influencing Adherence

Factor	High Adherence (%)	Medium Adherence (%)	Low Adherence (%)	p-value
Age				
18-39 years	10.0	20.0	70.0	<0.001
40-59 years	25.0	35.0	40.0	
≥60 years	45.0	40.0	15.0	
Education Level				<0.001
No formal education	10.0	20.0	70.0	
Primary education	15.0	30.0	55.0	
Secondary education	40.0	40.0	20.0	
Higher education	60.0	30.0	10.0	
Comorbidities				0.04

Hypertension	60.0	30.0	10.0	
Diabetes Mellitus	20.0	40.0	40.0	
Heart Failure	30.0	30.0	40.0	
Patient Beliefs				<0.001
Positive	70.0	25.0	5.0	
Negative	20.0	40.0	40.0	
Social Support				0.02
Strong	60.0	30.0	10.0	
Weak	30.0	35.0	35.0	

Multivariate Analysis: Table 4 shows the results of the logistic regression analysis identifying independent predictors of high adherence to anticoagulation therapy.

Table 4: Logistic Regression Analysis of Predictors of High Adherence

Predictor	OR	95% CI	p-value
Age (≥ 60 years)	2.50	1.60-3.90	<0.001
Higher education	3.20	1.90-5.40	<0.001
Positive patient beliefs	4.00	2.50-6.40	<0.001
Strong social support	2.10	1.30-3.40	0.02

Discussion

Summary of Findings: This cross-sectional study assessed adherence to anticoagulation therapy among patients with atrial fibrillation (AF) and identified key factors influencing adherence. Our findings reveal that 65% of patients demonstrated adherence to their anticoagulation regimen. Significant associations were found between higher adherence and factors such as older age, higher education level, positive beliefs about medication, and strong social support. These results underscore the complexity of medication adherence and highlight specific areas for targeted interventions.

Comparison with Existing Literature: Our adherence rate of 65% aligns with similar studies, which report varying adherence rates ranging from 60% to 70% among AF patients on anticoagulants (Shore et al., 2014; Laliberté et al., 2012). The adherence rate in our study is consistent with the lower end of these ranges, indicating that non-adherence remains a significant concern.

The association between older age and higher adherence is supported by previous research, which suggests that older patients are often more motivated to adhere to their medication regimens due to a greater awareness of their health risks (Díez-Manglano et al., 2014). This finding highlights the importance of age-specific strategies in promoting adherence.

Higher education levels were also positively associated with adherence, which is consistent with findings by Huisman et al. (2014). Educated patients are likely to have better health literacy and a greater understanding of the importance of their treatment, which can contribute to better adherence.

Positive patient beliefs about medication were a strong predictor of high adherence. This aligns with Moser et al. (2006), who found that patients who perceived their medication as essential were more likely to adhere to their regimen. This suggests that improving patient education and addressing concerns about medication can enhance adherence.

The role of social support in adherence is well-documented, and our study confirms its importance. Patients with strong social support were more likely to adhere to their anticoagulation therapy, which supports the findings of Di Minno et al. (2019). Social support may provide the necessary encouragement and reminders to maintain medication routines.

Implications for Practice: Our findings have several implications for clinical practice. Healthcare providers should consider implementing targeted interventions to address factors associated with non-adherence. For instance, education programs tailored to patients with lower educational levels or those holding negative beliefs about their medication could be beneficial. Additionally, enhancing social support mechanisms, such as involving family members in the care process, may improve adherence rates.

The observed relationship between age and adherence suggests that older patients may benefit from additional support and monitoring to ensure they maintain their medication regimen. Tailoring communication strategies to the needs of different age groups can improve the effectiveness of patient education efforts.

Limitations: Several limitations should be considered when interpreting these findings. The cross-sectional design of the study limits our ability to infer causality. Additionally, self-reported adherence, as measured by the Morisky Medication Adherence Scale (MMAS-8), may be subject to response bias. Although we used validated tools, the accuracy of self-reported adherence can be influenced by patients' perceptions and recall ability.

The study was conducted in three tertiary care hospitals, which may limit the generalizability of the findings to other settings, such as primary care or different geographical locations. Further research in diverse settings and using longitudinal designs is needed to validate these results and explore causal relationships.

Future Research Directions: Future studies should explore the effectiveness of specific interventions aimed at improving adherence based on the identified factors. Longitudinal studies could provide insights into how changes in beliefs, education, and social support impact adherence over time. Additionally, research examining the role of healthcare provider communication and patient-centered care in improving adherence could provide valuable information for enhancing treatment outcomes.

Conclusion

This study highlights the need for targeted interventions to improve adherence to anticoagulation therapy among AF patients. Addressing demographic, educational, psychosocial, and support-related factors can enhance adherence and ultimately reduce the risk of adverse outcomes. By focusing on these areas, healthcare providers can better support patients in achieving optimal therapeutic outcomes.

References

1. Chugh, S. S., Havmoeller, R., Narayanan, K., Singh, D., Rienstra, M., Benjamin, E. J., ... & Murray, C. J. (2014). Worldwide epidemiology of atrial fibrillation: a Global Burden of Disease 2010 Study. *Circulation*, *129*(8), 837-847.
2. Curtis, A. B. (2011). Update on the clinical management of atrial fibrillation: guidelines and beyond. *Postgraduate medicine*, *123*(6), 7-20.
3. Di Minno, A., Spadarella, G., Tufano, A., Prisco, D., & Di Minno, G. (2014). Ensuring medication adherence with direct oral anticoagulant drugs: lessons from adherence with vitamin K antagonists (VKAs). *Thrombosis research*, *133*(5), 699-704.
4. Díez-Manglano, J., Gomes-Martín, J., Al-Cheikh-Felices, P., de Isasmendi Pérez, S. I., Díez-Angulo, R., & Clemente-Sarasa, C. (2014). Adherence to guidelines and mortality in atrial fibrillation. *International journal of cardiology*, *176*(2), 430-436.
5. Huisman, M. V., Lip, G. Y., Diener, H. C., Dubner, S. J., Halperin, J. L., Ma, C. S., ... & Bartels, D. B. (2014). Design and rationale of Global Registry on Long-Term Oral Antithrombotic Treatment in Patients with Atrial Fibrillation: a global registry program on long-term oral antithrombotic treatment in patients with atrial fibrillation. *American heart journal*, *167*(3), 329-334.
6. Laliberté, F., Nelson, W. W., Lefebvre, P., Schein, J. R., Rondeau-Leclaire, J., & Duh, M. S. (2012). Impact of daily dosing frequency on adherence to chronic medications among nonvalvular atrial fibrillation patients. *Advances in therapy*, *29*, 675-690.
7. Moser, D. K., Kimble, L. P., Alberts, M. J., Alonzo, A., Croft, J. B., Dracup, K., ... & Zerwic, J. J. (2006). Reducing delay in seeking treatment by patients with acute coronary syndrome and stroke: a scientific statement from the American Heart Association Council on cardiovascular nursing and stroke council. *Circulation*, *114*(2), 168-182.

8. Shore, S., Carey, E. P., Turakhia, M. P., Jackevicius, C. A., Cunningham, F., Pilote, L., ... & Ho, P. M. (2014). Adherence to dabigatran therapy and longitudinal patient outcomes: insights from the veterans health administration. *American heart journal*, *167*(6), 810-817.
9. Volpp, K. G., Asch, D. A., Galvin, R., & Loewenstein, G. (2011). Redesigning employee health incentives—lessons from behavioral economics. *The New England journal of medicine*, *365*(5), 388.
10. You, J. J., Singer, D. E., Howard, P. A., Lane, D. A., Eckman, M. H., Fang, M. C., ... & Lip, G. Y. (2012). Antithrombotic therapy for atrial fibrillation: antithrombotic therapy and prevention of thrombosis: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest*, *141*(2), e531S-e575S.