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Oral Anticoagulation Practices in Atrial Fibrillation: Real-World Clinician Preferences for NOAC versus VKA in an Indian Cohort

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Abstract

Background: Oral anticoagulation (OAC) is the cornerstone of stroke prevention in atrial fibrillation (AF). While non-vitamin K oral anticoagulants (NOACs) are now guideline-preferred over vitamin K antagonists (VKAs), prescription patterns vary widely across regions due to cost, physician familiarity, and patient comorbidities. Real-world data from India remains limited. This study evaluated anticoagulation practices, clinician preferences, and outcomes in hospitalized AF patients in a North Indian tertiary care setting.

Methods: This prospective observational study included 150 consecutive patients with electrocardiographically confirmed AF admitted between November 2022 and October 2023. Stroke and bleeding risk were assessed using the CHA_2DS_2-VASc and HAS-BLED scores, respectively. Prescription patterns of NOACs, VKAs, and antiplatelet agents were analyzed, along with in-hospital outcomes.

Results: The mean CHA_2DS_2-VASc score was 3.6 ± 1.2, with more than half of patients (51.4%) having a score ≥4. Nearly one-third (30.7%) were at high bleeding risk according to HAS-BLED scores, while 64.7% had moderate risk. Anticoagulation therapy was widely prescribed: NOACs in 60.7%, VKAs in 26.0%, and antiplatelets (aspirin 22.0%, clopidogrel 10.0%) in selected cases. Amiodarone or other antiarrhythmics were used in 65.3% of patients. In-hospital mortality was 6.0%, primarily due to stroke and sepsis, while the mean hospital stay was 6.1 ± 2.6 days.

Conclusion: In this real-world Indian cohort, the majority of AF patients were at high thromboembolic risk but also carried a significant bleeding risk. Despite these challenges, OAC use was common, with NOACs preferred over VKAs, reflecting increasing adoption of guideline-directed therapy. However, the continued use of VKAs and antiplatelet agents

highlights the persisting influence of cost and physician familiarity. Expanding access to NOACs and structured risk stratification are essential to improve stroke prevention in Indian AF patients.

Keywords: atrial fibrillation, oral anticoagulation, NOAC, VKA, CHA_2DS_2-VASc, HAS-BLED, India

Introduction

Atrial fibrillation (AF) is the most common sustained arrhythmia worldwide and is associated with substantial morbidity and mortality, primarily due to thromboembolic complications such as ischemic stroke [1]. The lifetime risk of developing AF is estimated to be one in four among adults over the age of 40, and its prevalence continues to rise globally in parallel with aging populations and the growing burden of cardiovascular risk factors [2,3].

Oral anticoagulation (OAC) is the cornerstone of stroke prevention in AF. For decades, vitamin K antagonists (VKAs), particularly warfarin, were the mainstay of therapy. However, their limitations—including narrow therapeutic index, variable dose-response, need for frequent monitoring, and dietary or drug interactions—have posed challenges in clinical practice [4]. The advent of non-vitamin K oral anticoagulants (NOACs), including dabigatran, rivaroxaban, apixaban, and edoxaban, has transformed AF management by offering predictable pharmacokinetics, fixed dosing, and fewer monitoring requirements [5]. Large randomized controlled trials have demonstrated the efficacy and safety of NOACs, leading to their inclusion as first-line agents in contemporary guidelines [6,7].

Despite these advances, OAC prescription patterns vary widely across regions due to differences in physician familiarity, drug availability, cost considerations, patient comorbidities, and perceived bleeding risks [8]. In India, where AF-related stroke contributes significantly to cardiovascular morbidity, there is limited real-world data on anticoagulation practices. Previous hospital-based studies suggest underutilization of OACs, with aspirin or dual antiplatelet therapy often prescribed inappropriately [9,10]. Furthermore, barriers such as affordability, lack of monitoring infrastructure, and clinician concerns about bleeding continue to influence therapeutic decisions [11].

The present study was conducted to assess clinician preferences for NOACs versus VKAs in a real-world Indian AF cohort, stratified by stroke and bleeding risk using CHA_2DS_2-VASc and HAS-BLED scores. By evaluating actual prescription practices and outcomes, this study provides insights into current anticoagulation trends and the challenges of implementing guideline-directed therapy in resource-limited settings.

Materials and Methods

This prospective, observational study was carried out in the Department of Cardiology at Fortis Escorts Heart Institute, New Delhi, a tertiary care referral center in North India. The study was conducted over a period of twelve months, from November 2022 to October 2023.

Study Population

All consecutive adult patients aged 18 years and above who were admitted with a diagnosis of atrial fibrillation (AF) during the study period were screened. The diagnosis of AF was confirmed by 12-lead electrocardiography (ECG) demonstrating irregularly irregular RR intervals, absence of discrete P waves, and the presence of fibrillatory baseline waves. Patients with electrocardiographic confirmation of AF, including paroxysmal, persistent, long-standing persistent, or permanent AF, were eligible for inclusion, provided they gave written informed consent. Exclusion criteria were atrial flutter or other supraventricular tachyarrhythmias, contraindications to oral anticoagulation such as active bleeding or advanced hepatic dysfunction, pregnancy or lactation, and refusal to participate.

Data Collection

For each patient, detailed demographic and clinical data were recorded using a structured case record form. Presenting complaints such as dyspnea, palpitations, chest pain, fatigue, and neurological deficits were documented. Comorbidities, including hypertension, coronary artery disease (CAD), diabetes mellitus, valvular heart disease, chronic kidney disease (CKD), thyroid disorders, obesity, smoking, and alcohol use, were also assessed. Stroke risk was evaluated using the CHA_2DS_2-VASc score, and bleeding risk was assessed using the HAS-BLED score. Prescription practices were analyzed by recording the use of non-vitamin K oral anticoagulants (NOACs) such as dabigatran, rivaroxaban, apixaban, and edoxaban; vitamin K antagonists (VKAs) such as warfarin and acenocoumarol; and antiplatelet agents including aspirin and clopidogrel. Concomitant use of antiarrhythmic drugs such as amiodarone, beta-blockers, and digoxin was also noted. Echocardiography was performed in all patients to evaluate left atrial size, left ventricular function, valvular pathology, and the presence of thrombus, with left ventricular ejection fraction (LVEF) measured using the Simpson's biplane method. Laboratory investigations included hemoglobin, renal and liver function tests, thyroid profile, electrolytes, and HbA1c levels.

Outcome Measures

The primary outcomes of interest were the prescription trends of NOACs versus VKAs and their relationship with stroke and bleeding risk scores. The secondary outcomes included the frequency of inappropriate use of antiplatelet agents in place of oral anticoagulation, the concomitant use of antiarrhythmics, and in-hospital adverse outcomes such as mortality and complications.

Ethical Considerations

The study was conducted in accordance with the ethical standards of the institutional ethics committee of Fortis Escorts Heart Institute, New Delhi. Written informed consent was obtained from all study participants, and strict confidentiality of patient data was maintained throughout the study.

Statistical Analysis

All data were compiled in Microsoft Excel 2019 and analyzed using SPSS version 25.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation (SD) and compared using the independent sample t-test or Mann–Whitney U test as appropriate. Categorical variables were summarized as frequencies and percentages, and comparisons were made using the Chi-square test or Fisher's exact test. Logistic regression was performed to determine independent predictors of oral anticoagulant prescription and adverse in-hospital outcomes. A two-tailed p-value of <0.05 was considered statistically significant.

Results

Stroke Risk Stratification

Stroke risk was assessed in all 150 patients using the CHA_2DS_2-VASc score. The mean score was 3.6 ± 1.2, indicating a predominantly high-risk cohort. More than half of the patients (51.4%) had a score ≥4, while 21.3% had a score of 3. Only 11.3% of patients had a score of 1, and none had a score of 0. These findings demonstrate that the majority of AF patients admitted to this cohort were at considerable risk of thromboembolic events.

Table 1. Stroke risk assessment (CHA_2DS_2-VASc score)

Score	n (%)
0	0 (0.0)
1	17 (11.3)
2	24 (16.0)
3	32 (21.3)
4	43 (28.7)
5	24 (16.0)
6	9 (6.0)
7	1 (0.7)

Bleeding Risk Stratification

Bleeding risk was evaluated using the HAS-BLED score. The majority (64.7%) had a moderate bleeding risk (score 1–2), while nearly one-third (30.7%) were at high risk (score ≥3). Only 4.7% of patients were at low risk. These findings highlight the challenge of anticoagulation management in this cohort, as most patients carried at least a moderate bleeding risk.

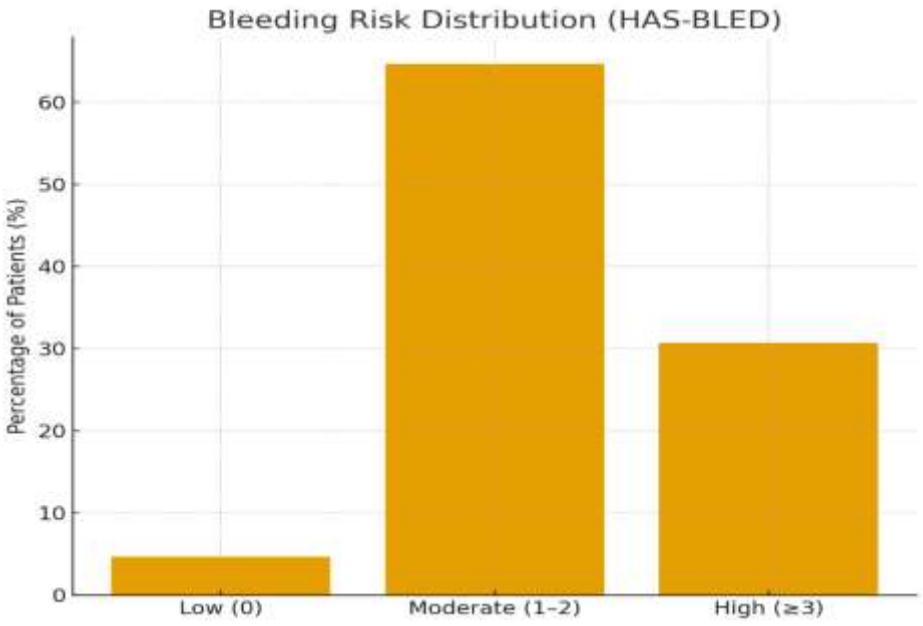

Figure 1. Bleeding risk distribution (HAS-BLED)

Prescription Patterns of Oral Anticoagulation

Prescription patterns revealed a strong preference for non-vitamin K oral anticoagulants (NOACs), which were prescribed in 60.7% of patients. Vitamin K antagonists (VKAs) were prescribed in 26.0%, while aspirin and clopidogrel were prescribed in 22.0% and 10.0%, respectively. Notably, 65.3% of patients received amiodarone or other antiarrhythmic agents in addition to anticoagulation, reflecting combined rate/rhythm control strategies in real-world practice.

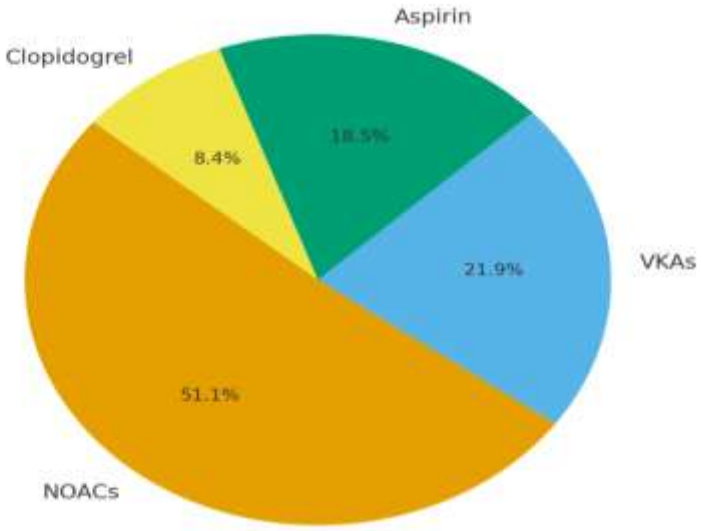

Figure 2. Prescription patterns of antithrombotic therapy in AF patients

In-Hospital Outcomes

Of the 150 patients, 141 (94.0%) were discharged in stable condition. However, nine patients (6.0%) died during hospitalization, with ischemic stroke and sepsis being the main contributors. The mean hospital stay was 6.1 ± 2.6 days (range 3–15 days). These findings demonstrate that while most patients with AF were managed successfully with anticoagulation and supportive care, a small but significant proportion had poor outcomes, particularly those with multiple comorbidities.

Discussion

This study offers insights into the real-world practices of oral anticoagulation (OAC) in patients with atrial fibrillation (AF) admitted to a tertiary care center in North India. Our findings demonstrate a strong preference for non-vitamin K oral anticoagulants (NOACs), which were prescribed in 60.7% of patients, compared with 26.0% for vitamin K antagonists (VKAs). The majority of patients had a high thromboembolic risk, as reflected by a mean CHA_2DS_2-VASc score of 3.6, while nearly one-third were at high bleeding risk according to HAS-BLED scores. Despite these challenges, anticoagulation therapy was widely adopted, and most patients were discharged in stable condition.

Stroke and Bleeding Risk

The stroke risk profile in our cohort is comparable to findings from the GARFIELD-AF registry, where the mean CHA_2DS_2-VASc score was 3.3–3.5 across global regions [8]. More than half of our patients had a score ≥4, underscoring the high thromboembolic burden in hospitalized AF patients in India. The bleeding risk, with nearly one-third classified as high risk, was also consistent with global registry data, where HAS-BLED scores ≥3 were observed in approximately 25–30% of patients [12]. These results highlight the delicate balance clinicians must maintain between stroke prevention and bleeding risk in anticoagulation decisions.

Anticoagulation Prescription Patterns

The high adoption of NOACs in our study (61%) reflects a shift toward contemporary guideline-directed practice. Randomized trials such as RE-LY, ROCKET-AF, and ARISTOTLE established the efficacy and safety of NOACs over warfarin, particularly in reducing intracranial hemorrhage [7, 13, 14]. Our findings are in line with the GLORIA-AF registry, which also reported a global preference for NOACs over VKAs in recent years [9].

In contrast, earlier Indian data suggested widespread underuse of OACs, with aspirin and dual antiplatelet therapy often prescribed inappropriately [10,11]. The current results indicate a shift in clinical practice in metropolitan centers, with physicians increasingly preferring NOACs, despite barriers such as higher costs and variable access. However, the persistent use of VKAs

(26%) in our study highlights that economic considerations and physician familiarity continue to influence prescribing patterns in India, consistent with previous reports [15].

In-Hospital Outcomes

In-hospital mortality was 6%, which is higher than that reported in outpatient registries such as ORBIT-AF, where 1-year mortality was 4% [15]. The higher mortality in our cohort likely reflects the hospitalized nature of the population, with advanced comorbidities including heart failure, diabetes, and chronic kidney disease. The mean length of stay of 6.1 days was comparable to data from Asian cohorts in the GARFIELD-AF registry [8].

Clinical Implications

Our findings suggest that anticoagulation practices in Indian tertiary care centers are increasingly aligned with international guidelines, with NOACs emerging as the preferred choice of anticoagulants. However, the continued use of VKAs and antiplatelet agents underscores the need for strategies to overcome barriers such as affordability, patient education, and infrastructure for long-term monitoring. Importantly, given the high thromboembolic and bleeding risk in this population, careful individualized risk stratification using CHA_2DS_2-VASc and HAS-BLED scores should be emphasized in clinical practice.

Conclusion

In this real-world cohort of atrial fibrillation patients from a North Indian tertiary care center, the majority were at high thromboembolic risk based on CHA_2DS_2-VASc scores. At the same time, nearly one-third also carried a high bleeding risk. Despite these challenges, oral anticoagulation was widely prescribed, with non-vitamin K oral anticoagulants (NOACs) preferred over vitamin K antagonists (VKAs), reflecting a shift toward guideline-directed therapy in Indian clinical practice. However, the continued use of VKAs and antiplatelet agents underscores the persisting influence of cost, availability, and clinician familiarity on prescribing patterns.

These findings highlight both the progress and challenges in implementing optimal anticoagulation strategies in India. Broader access to NOACs, greater physician awareness, and systematic risk stratification are essential to ensure effective stroke prevention while minimizing bleeding complications in AF patients.

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