

Clinical practices and treatment preferences in chronic coronary syndrome management among Indian physicians

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Abstract

Introduction: Chronic coronary syndrome (CCS) is a significant contributor to morbidity and mortality worldwide, particularly in India, where risk factors such as hypertension and diabetes are increasingly prevalent. Effective management of CCS typically involves lifestyle modifications, pharmacotherapy, and sometimes interventional procedures.

Methods: A digital questionnaire-based survey was conducted across multiple sites in India, involving cardiologists and consultant physicians. The survey comprised nine questions addressing the prevalence of CCS, preferred treatments, and factors influencing prescribing decisions for novel oral anticoagulants (NOACs).

Results: A total of 66 physicians were enrolled. Approximately 40.30% of physicians reported that more than 40% of their patients had CCS. The majority of physicians (57.81%) reported that dual antiplatelet therapy (DAPT) was most preferred treatment for CCS. Around 51% of physicians reported bleeding risk as the primary hindrance in prescribing rivaroxaban and aspirin for CCS patients. The majority of physicians (42.19%) preferred rivaroxaban with a prescription rate of 40%. Apixaban was most commonly prescribed at a rate of 30% by 33.87% of physicians, while dabigatran was typically prescribed at rates of 10% and 20% (41.82% each). Warfarin was prescribed for 10% of patients by 51.79% of respondents. In non-valvular atrial fibrillation cases, 73.13% preferred rivaroxaban primarily for its once-daily dosing advantage.

Conclusion: The present study reveals current trends in the management of CCS and the utilization of NOACs among physicians in India. It underscores the growing significance of NOACs, particularly rivaroxaban, in enhancing treatment outcomes for patients with CCS.

Keywords: CCS; Morbidity; Mortality; Hypertension; Diabetes

1. Introduction

Chronic coronary syndrome (CCS), encompassing various clinical manifestations of coronary artery disease (CAD), remains a primary contributor to global morbidity and mortality. [1, 2] In India, CCS poses a considerable challenge due to a growing prevalence of risk factors such as hypertension, diabetes, and lifestyle-related factors. [3] The symptoms of CCS such as chest discomfort, pain or dyspnea, are often associated with myocardial ischaemia resulting from

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coronary stenosis [2]. Diagnosing CCS involves evaluating these symptoms and assessing risk factors associated with CAD [4]. Medical therapy is the keystone in the management of patients with CCS, in order to improve both symptoms and prognosis [2]. The management of CCS involves a multifaceted approach encompassing lifestyle modifications, pharmacotherapy, and, in some cases, interventional procedures to alleviate symptoms and reduce cardiovascular risk [4]. Medications such as beta-blockers, antiplatelet agents, and innovative therapies like glucagon-like peptide 1 (GLP-1) agonists and sodium-glucose cotransporter-2 (SGLT-2) inhibitors play a crucial role in effectively managing cardiovascular risk factors and reducing adverse events [4].

Despite advances in therapy, patients with CCS remain at high risk for recurrent events, underscoring the importance of optimal medical therapy including antithrombotic and lipid-lowering treatments [5].

In recent years, the therapeutic landscape for CCS has expanded beyond traditional antiplatelet therapies and statins to include novel oral anticoagulants (NOACs). NOACs such as rivaroxaban, apixaban, and dabigatran, initially developed for stroke prevention in atrial fibrillation (AF), have garnered interest for their potential benefits in CCS management. Their ability to offer effective antithrombotic therapy with reduced bleeding risks compared to vitamin K antagonists presents a promising alternative for patients with CCS [6-9].

Thus, this study aimed to enhance current clinical knowledge by addressing gaps in understanding current practices and preferences among physicians regarding the use of NOACs in CCS management is crucial for optimizing patient care and improving treatment outcomes. This study presents findings from a digital questionnaire-based survey conducted across multiple sites in India, aimed at evaluating current clinical practices and treatment preferences among physicians in the management of CCS.

2. Materials and methods

2.1. Study design

This digital questionnaire-based survey was conducted across multiple sites in India. The survey exclusively involved the digital participation of cardiologists and consultant physicians.

2.2. Eligibility criteria

The survey questionnaire included a total of nine questions to evaluate the clinical practices and treatment strategies among physicians in the management of CCS and the use of NOACs. The questionnaire was designed to gather information on physicians demographics (specialty), the prevalence of CCS in clinical practice, preferred treatments for CCS, factors influencing prescribing decisions for NOACs (specifically rivaroxaban, apixaban, dabigatran, and warfarin), and the comparative advantages of rivaroxaban over apixaban in non-valvular atrial fibrillation (NVAf). Following the collection of all completed questionnaires, the data were reviewed and analyzed.

2.3. Study procedure

The study protocol, consent form, and questionnaire were shared digitally with physicians via an email. Physicians were requested to read the study protocol and the consent form and after reviewing, physicians who agreed to participate in the study were requested to sign the consent form digitally. The participation of physicians in this study was voluntary.

2.4. Statistical analysis

Data were analyzed using Microsoft Excel 2019. Descriptive analysis was used to present the study outcomes. Categorical variables were described as numbers and percentages.

3. Results

A total of 66 physicians were enrolled. Demographic characteristics of these physicians are represented in table 1. Physicians participated in the study were predominantly from Mumbai (34.85%), followed by Bengaluru (33.33%), and Nagpur (31.82%). Among the 67 physicians classified by specialty, 83.58% were cardiologists, and 16.42% were consultant physicians.

Table 1 Demographic characteristics of physicians

Parameters	Number of physicians (N=67)
Area	[n = 66]
Mumbai	23 (34.85)
Bengaluru	22 (33.33)
Nagpur	21 (31.82)
Specialty	
Cardiologist	56 (83.58)
CP	11 (16.42)
Data presented as n (%). CP, consultant physician.	

Approximately 40.30% of physicians reported that more than 40% of their patients had CCS. However, 25.37% of physicians reported for 30-40%. Majority of physicians (57.81%) reported that dual antiplatelet therapy (DAPT) was the most preferred treatment for CCS, while 35.94% of physicians preferred for single platelet therapy only 14.06% of physicians preferred the combination of rivaroxaban + aspirin (Table 2).

Table 2 Response to Survey

Parameters	Number of physicians (N=67)
Percentage of patients suffering from chronic coronary syndrome	
<10%	2 (2.99)
10-20%	9 (13.43)
20-30%	12 (17.91)
30-40%	17 (25.37)
>40%	27 (40.30)
Preferred treatment in chronic coronary syndrome patients	
Dual antiplatelet therapy	37 (57.81)
Single antiplatelet therapy	23 (35.94)
Rivaroxaban + Aspirin (Dual pathway inhibition)	9 (14.06)
Data presented as n (%).	

Table 3 represents the factors influencing prescribing practices of rivaroxaban and aspirin in patients with CCS. Around 51% of physicians reported bleeding risk as the primary hindrance in prescribing rivaroxaban and aspirin for CCS patients, followed by cost of treatment (38.81%), and evidence (14.93%). Moreover, multiple risk factors (33.33%) were reported to influence prescribing rivaroxaban in CCS patients, followed by guideline approvals (30.30%), large evidence (24.24%), and clinical experience shared by peers (12.12%).

Table 3 Factors influencing prescribing practices of Rivaroxaban and aspirin in CCS patients

Parameters	Number of physicians (N=67)
Percentage of prescribing Rivaroxaban + Aspirin in chronic coronary syndrome patients	
Bleeding	34 (50.75)
Cost of treatment	26 (38.81)
Evidence	10 (14.93)
Guidelines approval	9 (13.43)
Polypharmacy	7 (10.45)
Clinical experience	4 (5.97)
Response to prescribing Rivaroxaban in chronic coronary syndrome	
Multiple risk factors	22 (33.33)
Guideline approvals	20 (30.30)
Large evidence	16 (24.24)
Clinical experience shared by peers	8 (12.12)
Data presented as n (%).	

Majority of physicians (42.19%) preferred rivaroxaban with a prescription rate of 40%, followed by 30% (18.75%). Similarly, for apixaban the most common prescription rate was 30%, reported by 33.87% of physicians, with 22.58% prescribing at 20% and 19.35% at 10%. The most frequent prescription rates of dabigatran were 10% and 20%, each reported by 41.82% of physicians. Additionally, 14.55% of physicians prescribed it at a 30% rate, while 1.82% prescribed it at a 50% rate. The majority of physicians (51.79%) prescribed warfarin for 10% of their patients. However, 16.07% of physicians prescribing it at a 20% rate, and 10.71% at a 30% rate (Table 4).

Table 4 Physician preferences for NOACS therapy

Parameters	Number of physicians (N=64)
Percentage on the basis of the prescriptions and preference for the various NOACs [Rivaroxaban]	
10	5 (7.81)
20	5 (7.81)
30	12 (18.75)
40	27 (42.19)
50	4 (6.25)
60	3 (4.69)
70	4 (6.25)
80	3 (4.69)
100	1 (1.56)
Percentage on the basis of the prescriptions and preference for Apixaban	

10	12 (19.35)
20	14 (22.58)
30	21 (33.87)
40	10 (16.13)
50	4 (6.45)
60	1 (1.61)
Percentage on the basis of the prescriptions and preference for Dabigatran	
10	23 (41.82)
20	23 (41.82)
30	8 (14.55)
50	1 (1.82)
Percentage on the basis of the prescriptions and preference for Warfarin	
10	29 (51.79)
20	9 (16.07)
30	6 (10.71)
40	5 (8.93)
50	2 (3.57)
60	2 (3.57)
70	1 (1.79)
80	1 (1.79)
90	1 (1.79)
Data presented as n (%). NOACS, novel oral anticoagulants.	

In cases of NVAf, 73.13% of physicians chose to prescribe rivaroxaban primarily because of its once-daily dosage advantage, while 11.94% of physicians reported efficacy and 5.97% reported that lower bleeding risk as the main reason for their choice. (Table 5).

Table 5 Response to prescribing rivaroxaban over apixaban in non-valvular atrial fibrillation

Options	Number of physicians (N=67)
OD dosage advantage	49 (73.13)
Efficacy	8 (11.94)
Less bleeding risk	4 (5.97)
Comorbidities	3 (4.48)
Both are equally effective	2 (2.99)
Not good	1 (1.49)
Data presented as n (%). OD, once daily.	

4. Discussion

The CAD results from atherosclerotic plaque buildup in coronary arteries, presenting variably from asymptomatic stages to ACS and to stable CCS [10]. This study provides a comprehensive overview of current practices and preferences among physicians regarding the management of CCS and the use of NOACs, focusing on rivaroxaban and apixaban in particular.

The objective of CCS therapy is to minimize the incidence of heart attacks, mortality rates, and acute clotting events, thereby preventing ventricular dysfunction [11]. The DAPT is the standard strategy in patients with CCS, while antiplatelet monotherapy is commonly prescribed for long-term prevention of cardiovascular events [12]. Moreover, the dual antiplatelet therapy (DAPT) study demonstrated a reduced risk of major adverse cardiovascular events (MACE), myocardial infarction (MI), and stent thrombosis with DAPT compared to aspirin in CCS patients following PCI [13]. Similarly in present study, majority of physicians reported that DAPT was the most preferred treatment for CCS, while 35.94% of physicians preferred for single platelet therapy.

In recent trial in primary prevention have yielded inconsistent benefits of aspirin in reducing CVD events, alongside an elevated risk of bleeding [14]. Furthermore, a meta-analysis conducted by Khan et al. demonstrated that the use of rivaroxaban reduced MACE but was associated with an increased risk of bleeding [15]. However, Bailey KR, et al observed that compared to aspirin alone, combining low-dose rivaroxaban (2.5 mg twice daily) with aspirin in dual pathway inhibition reduced the risk of stroke or cardiovascular death. This benefit was observed despite the increased risk of bleeding events in CCS patients, as highlighted in the Cardiovascular Outcomes for People using Anticoagulation Strategies (COPASS-PCI) study [16]. In consistent with these results, the present study showed that half of the physicians reported bleeding risk as the primary concern when prescribing rivaroxaban and aspirin for CCS patients. It highlights this combination reduces the risk of stroke or cardiovascular death compared to aspirin alone, concerns about increased bleeding risk remain significant among physicians, affecting treatment decisions in clinical practice.

There was a notable rise in the prescription of NOACs, which constituted more than 50% of all oral anticoagulation (OAC) prescriptions by 2015. Overall, the study findings showed that rivaroxaban prescription has increased from 3.3% in 2015 to 28.9% in 2020, which substantiates previous findings in the published literature [17-19]. Among NOACs, rivaroxaban was the most frequently prescribed, followed by apixaban and dabigatran [20].

Rivaroxaban 20 mg dose showed superior efficacy among patients with NVAF compared to other strengths, indicating potential benefits in clinical practice [21]. The present study also indicated a higher preference for rivaroxaban at a 40% prescription rate, highlighting a potentially broader acceptance of this regimen in clinical practice. Moreover, in Xarelto for prevention of stroke in patients with atrial fibrillation (XANTUS) study, 15% of AF patients without renal impairment received 15 mg once daily, while 36% of those with renal impairment and requiring dose reduction were prescribed 20 mg of rivaroxaban daily. The results further showed that the 15 mg once-daily dose was associated with higher incidence rates of major bleeding, all-cause death, and combined thromboembolic events including stroke, systemic embolism, transient ischemic attack, and myocardial infarction compared to the 20 mg once-daily dose [22]. These findings suggest that 20 mg dose of rivaroxaban demonstrates a superior efficacy for patients with CCS compared to other dosages, suggesting it may be more beneficial in clinical practice.

Initial data from a Danish national registry of atrial fibrillation patients in 2011 indicated minimal utilization (2-3%) of dabigatran [23]. Additionally, previous research has indicated that dabigatran has consistently shown lower initiation rates compared to rivaroxaban and apixaban, with trends suggesting that over time, prescriptions of dabigatran plateau and are surpassed by both rivaroxaban and apixaban [19, 24]. In parallel with this findings, the present study showed that dabigatran was prescribed at rates of 10% and 20%.

The present study revealed that most physicians prescribed to only 10% of their patients. This finding aligns with the results of the Randomized Evaluation of Long-Term Anticoagulation Therapy (RE-LY) and Apixaban for Reduction in Stroke and Other Thromboembolic Events in Atrial Fibrillation (ARISTOTLE) trials which demonstrated the superiority of dabigatran and apixaban, respectively, over warfarin in reducing stroke and other thromboembolic events in atrial fibrillation [25, 26]. Additionally, a retrospective study involving more than 41,000 medicare beneficiaries with AF showed a notable reduction in warfarin prescription rates with increasing age and the presence of multiple comorbidities [27].

In previous study clinicians tend to prefer prescribing rivaroxaban over dabigatran for DOACs, likely due to two primary reasons. Firstly, rivaroxaban offers once-daily dosing, which is simpler compared to dabigatran's twice-daily regimen. Secondly, there is a perception that dabigatran carries a higher bleeding risk than rivaroxaban, influenced by several

post-marketing FDA case reports [28]. According to Jeong HK, et al., rivaroxaban administered once daily is expected to achieve higher peak and lower trough serum levels than when administered twice daily [29]. A recent study using the pharmacy quality alliance adherence measure found that patients prescribed once-daily rivaroxaban showed better adherence compared to those prescribed twice-daily apixaban [30, 31]. In present study, 73.13% of physicians reported that once-daily dosage advantage was the primary reason for prescribing rivaroxaban over apixaban.

Limitations

The studies exclusively focused on rivaroxaban, apixaban, dabigatranas the primary NOACs examined may restrict the breadth of its findings and their applicability to broader treatment strategies. By considering of other relevant NOACs or alternative anticoagulant options used in managing CCS, the study potentially overlooks important treatment variations that could impact clinical outcomes. This limitation underscores the need for a more comprehensive assessment that includes a wider array of available therapies to provide a treatment preferences and efficacy in CCS management.

5. Conclusion

This study highlights current trends in CCS management and NOAC utilization among physicians in India. The findings underscore the growing role of NOACs, particularly rivaroxaban, in optimizing treatment outcomes for CCS patients. This study provides valuable insights into the clinical practices and treatment decision-making processes concerning CCS among Indian physicians, aiming to improve patient outcomes.

Compliance with ethical standards

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Disclosure of conflict of interest

Amit Gupta, and Neeta Keertane are employees of USV Private Limited, Mumbai. All other authors have nothing to disclose.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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