International Journal of Research in Medical Sciences
Jain D et al. Int J Res Med Sci. 2023 Jul;11(7):2503-2507
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20232090

Original Research Article

Real-world clinical experience of ticagrelor in Indian patients with acute coronary syndrome after discharge from a tertiary setting

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Received: 12 April 2023
Revised: 11 May 2023
Accepted: 31 May 2023

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ABSTRACT

Background: To understand the usage pattern of ticagrelor in real-life clinical experience in Indian patients with the acute coronary syndrome (ACS) after discharge from a tertiary care setting.
Methods: A retrospective multicentric observational study conducted across Indian healthcare centers having medical records of adult patients with ACS. Patients prescribed with ticagrelor post-discharge for at least 1 month were included. The study endpoints were to determine the clinical effectiveness of ticagrelor in post-ACS patients and adverse events reported during the study period.
Results: A total of 1910 patients with ACS with a mean (SD) age of 58.2 (11.3) years were enrolled in this study. The median (IQR) duration of treatment was 30.0 (30.0-90.0) days. More than half of the patients (n=1115, 58.4%) were managed with interventional therapy. The most common comorbid conditions were type-2 diabetes mellitus (46.9%), followed by hypertension (36.8%). A total of 9.7% of patients reported complaints after treatment with ticagrelor. Among them, weakness, giddiness, and body pain were the most common (3.2%).
Conclusions: This real-world study revealed that ticagrelor had been used widely in patients who underwent different management strategies. History of diabetes and hypertension were the most common risk factors. There were no major adverse events reported during the follow-up, indicating ticagrelor is well-tolerated in Indian patients with ACS.

Keywords: ACS, Anti-platelet, Intervention, Ticagrelor

INTRODUCTION

The incidence of acute coronary syndrome (ACS) in India is rising at an alarming rate, substantially contributing to the disease burden. Particularly in India, ACS patients have a higher proportion of ST-segment elevation myocardial infarction (STEMI) as compared to developed countries.[1] Moreover, based on epidemiological data, India has one of the highest burdens of IHD in the world, contributing to 1.54 million death and 36.99 million disability-adjusted life years.[2] This suggests that ACS is associated with high rates of morbidity and mortality and its management remains challenging despite advances in treatment.[3,4] Oral antiplatelet therapy, including clopidogrel, ticagrelor, and prasugrel, remains a cornerstone for patients with ACS.

Ticagrelor, a reversible and direct-acting cyclopentyl triazolopyrimidines antagonist, inhibits P2Y12 faster than alternative agents. Ticagrelor binds to P2Y12 receptors reversibly and noncompetitively. The effectiveness of ticagrelor 90 mg twice daily has been demonstrated in randomized controlled trials in patients with ACS with a good tolerability profile.[5,6] The guidelines recommend ticagrelor or prasugrel over clopidogrel in patients with ACS who are undergoing percutaneous coronary intervention (PCI).[7,8]

In 2012, ticagrelor was approved for use in India.[9] Previous therapeutic studies of ticagrelor in Indian patients with ACS have compared the effectiveness of ticagrelor with either clopidogrel or prasugrel.[10-12] However, there has been limited retrospective analysis of available data in Indian hospitals.[13]

As a result, this study was designed to understand the usage pattern of ticagrelor in real-life clinical experiences in Indian patients with ACS after discharge from a tertiary care setting.

METHODS

Study design

This was a real-world, retrospective, multi-centric observational study conducted between January 2020 and December 2021 across Indian healthcare centers (n=1000) having medical records of adult patients with ACS who had received treatment with ticagrelor as an antiplatelet therapy for the prevention of cardiovascular events.

Study population

Retrospectively identified patients of either sex, aged 18 years or above with a diagnosis of ACS, and who had been prescribed ticagrelor upon discharge for at least 1 month were included. Data related to demographic characteristics, duration of treatment, comorbidities, any interventional or medical therapies, and complaints related to treatment were collected from medical records. The study endpoints were to determine the clinical effectiveness of ticagrelor in post-ACS patients and adverse events reported during the study period related to ticagrelor treatment.

Statistical analysis

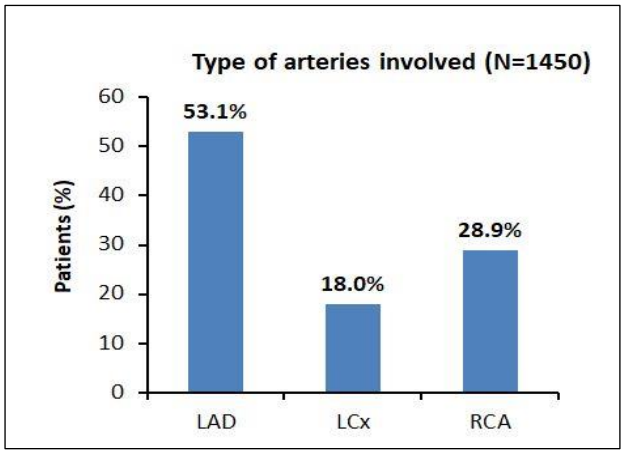
Considering the nature of the study, no formal sample size was employed. The data was collected in Excel Sheet, and the statistical analysis was performed using SPSS, version 23.0. Categorical variables were presented as numbers and percentages, whereas continuous variables were expressed as mean and standard deviation or median and interquartile range.

RESULTS

A total of 1910 patients with ACS were studied retrospectively. The mean (SD) age was 58.2 (11.3) years. Men had a higher incidence of ACS than women (75.7% vs. 24.3%). The median (IQR) duration of treatment was 30.0 (30.0-90.0) days. More than half of the patients (58.4%) were managed with interventional therapies, including PCI or percutaneous transluminal coronary angioplasty (PTCA) or coronary artery bypass graft (CABG). The remaining patients were managed with medical therapy (41.6%). Single or more than one stent was used in 23.4% of patients (Table 1). A total of 1450 patients were observed with the involvement of arteries. The majority of patients were observed with involvement of the left anterior descending artery (53.1%), followed by the right coronary artery (28.9%) and left circumflex artery (18.0%) (Figure 1).

Table 1: Demographic characteristics in ACS patients treated with ticagrelor.

Characteristics	Number of patients (N=1910)
Age (years), mean (SD)	58.2 (11.3)
Sex	
Men	1446 (75.7)
Women	464 (24.3)
Duration (days), median (IQR)	30.0 (30.0-90.0)
Interventional therapy	1115 (58.4)
Medical therapy	795 (41.6)
One or more than one stent	447 (23.4)
Data shown as n (%), unless otherwise specified. IQR, interquartile range; SD, standard deviation	



LAD, left anterior descending artery; LCx, left circumflex, RCA, right coronary artery

Figure 1: Arteries involved in patients with ACS.

The most common comorbid conditions were type-2 diabetes mellitus (46.9%), followed by hypertension (36.8%). Dyslipidemia (7.0%), peripheral vascular disease (5.3%), chronic kidney disease (3.8%), diabetic

foot (3.7%), and diabetic retinopathy (1.2%) were also reported in a small proportion of patients (Table 2).

Table 2: Associated comorbid conditions.

Comorbidities	
Type-2 diabetes mellitus	897 (46.9)
Hypertension	704 (36.8)
Dyslipidemia	133 (7.0)
Peripheral vascular disease	102 (5.3)
Chronic kidney disease	73 (3.8)
Diabetic foot	71 (3.7)
Diabetic retinopathy	23 (1.2)

Table 3: Complaints.

Complaints	Total (N=186)
Weakness, giddiness, and body pain	62 (3.2)
Chest pain	58 (3.0)
Breathlessness	41 (2.1)
Reduced appetite and sleep	24 (1.3)
Abdominal pain/ discomfort	10 (0.5)
Knees and limb pain	9 (0.5)
Sweating	9 (0.5)
Itching	5 (0.3)
Tingling sensation	5 (0.3)
Back pain	3 (0.2)
Jaw pain	2 (0.1)

A total of 186 (9.7%) patients reported complaints after treatment with ticagrelor (Table 3). The common complaints were weakness, giddiness, and body pain (3.2%), followed by chest pain (3.0%), breathlessness (2.1%), and reduced appetite and sleep (1.3%).

DISCUSSION

A present, ACS is a leading cause of mortality and a primary reason for hospitalizations. A wide variety of antiplatelet agents have been used for decades to improve the outcome of patients with ACS for their antithrombotic and anti-inflammatory properties. The present study evaluated the clinical experience of ticagrelor prescribed in 1910 post-discharge patients with ACS. Recently, cardiology societies, including the American College of Cardiology, the American Heart Association, the European Society of Cardiology, and the European Association for Cardio-Thoracic Surgery, recommended ticagrelor as an alternative to clopidogrel for patients with ACS.[14,15] These recommendations are based on the Platelet Inhibition and Patient Outcomes (PLATO) trial, which demonstrated that ticagrelor was superior to clopidogrel in patients with ACS.[5] Based on PLATO and the revised guidelines, ticagrelor use increased rapidly worldwide.[16,17]

According to the European Society of Cardiology (ESC) guidelines, dual antiplatelet therapy (DAPT) with ticagrelor and prasugrel should be considered instead of DAPT with clopidogrel where contraindications do not exist.[18]

An observational study conducted in tertiary care hospitals across India in patients with ACS reported a high prevalence of STEMI (48.9%), NSTEMI (23.0%), and unstable angina (28.1%).[13] The use of ticagrelor and aspirin is indicated in the management of ACS (unstable angina, STEMI, and NSTEMI) as well as for secondary prevention of thrombotic events in patients who will undergo PCI or coronary artery bypass graft or medical management.[19,20] In line with this, nearly half of the patients in this study underwent medical management therapy, and ticagrelor was found to be effective in managing ACS in these patients.

The evaluation of risk factors for ACS patients was performed in this study. A history of T2DM and hypertension were reported as the most common comorbid condition. Similar findings were observed by Sawhney et al. where diabetes and hypertension were reported in >40% of patients with ACS who were prescribed ticagrelor upon discharge or ≤1 month.[13] In their study, smoking was the most common risk factor in patients <40 years of age. However, the present study could not evaluate smoking status.

In the median 30 days of treatment, 9.7% of patients reported adverse events. Among them, weakness, giddiness, body pain, and chest pain were the most common adverse events reported in these patients. The current study, however, did not report any clinical events of bleeding in this short period. However, previous studies found that patients treated with ticagrelor showed bleeding as a major adverse effect.[5,13] The PLATO trial found 11.6% of cases of major bleeding with ticagrelor, while the TREASURE study found two subjects who experienced PLATO major bleeding.[5,13] Even ticagrelor, compared with clopidogrel, showed no difference in Bleeding Academic Research Consortium (BARC) bleeding and in the unadjusted incidence of hospital major adverse cardiovascular events.[11]

The study has several limitations. Detailed information on the dosage of ticagrelor, concomitant medication, and diagnosis were not included. The unmeasured baseline characteristics may lead to residual confounding, such as confounding by indication in the observational study.

CONCLUSION

In conclusion, this real-world study revealed that ticagrelor had been used across ACS types and in different management strategies including medical management. Most of the patients underwent interventional therapy and a history of diabetes and hypertension were more prevalent. There were no major adverse events reported during the follow-up, indicating ticagrelor is well-tolerated in Indian patients with ACS.

ACKNOWLEDGEMENTS

Authors would like to thank Snehal Khanolkar from Sqarona Medical Communications LLP (Pune) for providing medical writing assistance.

Funding: Funded by USV Private Limited, Mumbai
Conflict of interest: Dr. Ashish Birla, Dr. Santosh Revankar and Dr. Shaijesh Wankhede are/were employees of USV Pvt Ltd. All other authors have no conflicts of interest to declare
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Jain D, Roy S, Srinivasan B, Kumar S, Wankhede S, Revankar S, Birla A. Real-world clinical experience of ticagrelor in Indian patients with acute coronary syndrome after discharge from a tertiary setting. Int J Res Med Sci 2023;11:2503-7.