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Case Study

Rivaroxaban: Management of Coronary Artery Thrombosis in a Patient Presenting with Anterior Wall Myocardial Infarction

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ABSTRACT

Coronary artery thrombosis is one of the most common clinically manifested arrhythmias that if not treated timely leads to morbidity and mortality particularly stroke or myocardial infarction. Anticoagulants are already the first line of treatment that are adopted for the prevention of coronary artery thrombosis however, there is need of a novel and potent anticoagulant that could help to reduce the frequency of coronary or atherothrombotic events in patients presenting with coronary diseases. **Case Summary:** We present a case of anterior wall myocardial infarction (AWMI) driven by coronary artery thrombosis. The patient upon diagnosis was also found to have a clot in proximal left anterior descending artery (LAD). The patient was treated and discharged on anticoagulation therapy. We examined and report the effectiveness of anticoagulation therapy via a novel oral anticoagulant. i.e. Rivaroxaban for managing the risk of coronary artery thrombus associated with AWMI within our patient. Onset of coronary artery thrombosis is associated with the mortality in myocardial infarct patients, regardless of its timing. This calls out for the need to manage the disease by adopting strategies that would prevent the frequent onset of these events in myocardial infarct survivors. Treatment with Rivaroxaban has emerged as a promising oral anticoagulant that could potentially serve as a long-term anticoagulant for managing coronary artery thrombosis in patients with heart complications.

INTRODUCTION

Anterior wall myocardial infarction is a common cause of death around the world. AWMI is defined as an irreversible necrosis of heart muscle in which the blood supply to the anterior wall of heart is decreased as a result of coronary artery blockage [1]. In developing countries such as South Asia and Eastern Europe there is a rise in the cases of myocardial infarction (MI) due to poor health care system as compared to developed countries. Moreover, prevalence of MI in men of all age-groups is reported to be higher as compared to women [2]. With the increasing prevalence of coronary artery thrombosis, there is a need of an efficacious yet a safe intervention for the treatment and management of this chronic disorder. Rivaroxaban has emerged as a potential novel oral anticoagulant (NOAC) or dual oral anticoagulants (DOAC) that has been reportedly found to decrease the incidence of thromboembolism or coronary thrombus events in patients with Atrial Fibrillation (AF) by more than 50% [3]. Rivaroxaban is a direct oral factor Xa inhibitor that reversibly binds and inhibits both free and clot bound factor Xa. High bioavailability and ease of administration makes it a good choice NOAC for treatment of NVAF leading to coronary thrombus [4]. Previous use of rivaroxaban has been in the treatment of Atrial Fibrillation (NVAF), pulmonary embolism and deep vein thrombosis [5]. However, use of rivaroxaban to treat coronary artery thrombosis has not

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been reported before. Here we highlight the importance of Rivaroxaban as a new and improved NCOC/DOAC over the conventional anticoagulants (Vitamin K) and its usage for treating and managing coronary artery thrombosis in patients with coronary complications and MI.

CASE PRESENTATION

A 34-year old man (resident Wazirabad, district Gujranwala) was presented at Wazirabad Institute of Cardiology (WIC) on 23rd June, 2021, with a complaint of epigastric pain for past 3 days. He was diagnosed with AWMI however the patient was found to be late for streptokinase therapy. He underwent angiography through right radial artery on 26/6/2021. Angiography revealed the presence of a clot in proximal LAD (Left Anterior Descending Artery). He was discharged on Rivaroxaban 10 mg (once a day for 2 weeks) along with antiplatelet drugs and anti-ischemic therapy. He then came to Mayo Hospital, Lahore on 1/7/2023 after 1 week of 1st angiography where patient underwent coronary angiography through femoral artery with an intent to PCI to LAD if coronary thrombosis persisted. However, map view indicated recanalized vessel with mild proximal disease and thrombus so the procedure was abandoned. The patient was discharged on Xcept (Rivaroxaban) of 10 mg dosage.

Table 1: The above table indicates Thyroid functional test with a value indicating a normal thyroid function within our patient.

Special Chemistry Report			
Thyroid Functional Test			
Test	**Result**	**Reference Value**	**Unit**
TSH	3.437	<0.34 Hyperthyroidism	µLu/ml
		0.34-5.60 Euthyroid	µLu/ml
		>5.60 Hypothyroidism	µLu/ml

Figure 1: A, B and C indicates coronary angiography of patient

DISCUSSION

The incidence and prevalence of coronary artery thrombosis is on the rise hence justifying the term global epidemic. Several reports highlight the susceptibility of patients to other coronary and non-coronary diseases within the first six months of diagnosis being made on coronary artery thrombosis [6]. Individuals with coronary artery thrombosis are at high risk of developing several complications like AWMI [1]. With the increasing prevalence, more proactive methods are required to manage AWMI and its associated complications. Keeping this in view, Rivaroxaban has emerged as an alternate treatment option for AWMI to dissolve coronary thrombosis which has been previously reported to treat heart complications such as atrial fibrillation, pulmonary embolism and deep vein thrombosis [7]. Previous studies reported a reduced rate of MI in patients with AF when treated with Rivaroxaban [8]. Another case study reported the effective use of Rivaroxaban, a direct factor-Xa inhibitor, to treat patient presenting with acute coronary syndrome caused by widespread non- occlusive thrombotic foci in coronary artery due to genetic mutation [9]. However, reports on treatment of coronary artery thrombosis in patients with anterior wall myocardial infarction with Rivaroxaban are absent. Here we report the dissolution of thrombosis after 2 weeks or 10 days upon administration of 10mg/day Rivaroxaban in patient with coronary artery thrombosis. Therefore, Rivaroxaban may provide an additional therapeutic choice for treatment of AWMI patients with coronary artery thrombosis via Xa inhibition.

CONCLUSIONS

The multitude advantages of Rivaroxaban as a DOACs which include stable pharmacokinetics, shorter half-life, lower drug dosage and rapid elimination of effect after discontinuation makes it a good drug of choice for long-term anticoagulant therapy in managing AWMI. However, safety and effectiveness of DOACs like Rivaroxaban further needs to be verified through high quality research data that involves conducting large sized Randomized control trials.

CONCLUSIONS

Conceptualization: AT
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All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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