# Rivaroxaban induced Thrombocytopenia

Nyein Chan Swe MD, Nay Min Tun MD, Richard W Pinsker MD, FACE, FACPM, Jose Cervantes MD
Department of Internal Medicine, Jamaica Hospital Medical Center, New York, NY

## Introduction

Factor Xa inhibitors (rivaroxaban and apixaban) are preferred agents in a patient with acute venous thromboembolism for long-term anticoagulation who are not pregnant women, severe renal insufficiency and active cancer.[1] The incidence of thrombocytopenia after initiating treatment with rivaroxaban are very rare. Herein, we report a case of a 39-year-old Hispanic female who developed severe thrombocytopenia after receiving rivaroxaban.

## Case Presentation

A 39-year-old Hispanic female with no past medical history presented to the ED after she had a near syncope episode at home. In the ED, vitals were within normal range. Initial labs showed WBC 13.6 x $10^3$/µl, hemoglobin 12.1 g/dl, hematocrit 37%, platelet count 111 x $10^3$/µl. Chemistry, electrolytes and liver function test were within normal range except for elevated troponin I (1.190 ng/mL). Arterial blood gas on room air showed pH 7.44/ $PaCO_2$ 31/ $PO_2$ 78/ $HCO_3^-$ 21.1 with A-a gradient 33 mmHg.

The patient underwent CT pulmonary angiogram which revealed extensive bilateral acute pulmonary embolism. She was treated with therapeutic dose of enoxaparin and was later bridged to warfarin. The patient was discharged home on oral warfarin with INR in therapeutic range. The CBC count one week after initiating warfarin showed platelet count of 279 x $10^3$/ µl.

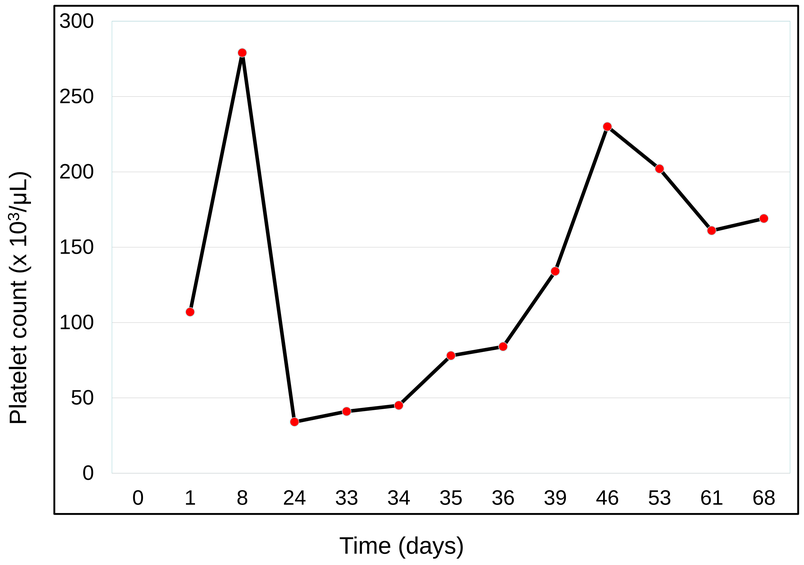


**Figure 1:**Trend of platelet count

The warfarin was switched to rivaroxaban by the PCP. The patient underwent hypercoagulopathy study which was all negative. The CBC done 6-weeks after taking rivaroxaban revealed that platelet count was 35 x $10^3$/µl. The patient was again admitted to hospital due to thrombocytopenia. Rivaroxaban was stopped and the patient was given heparin infusion.

The **fibrinogen level** was found to be **463 mg/dl** which ruled out consumption coagulopathy. **Heparin induced antibody was negative**. Heparin infusion was bridged to warfarin. Platelet count improved gradually upon discontinuing rivaroxaban. 4 days after discontinuing rivaroxaban, platelet count increased to 84 x $10^3$/µl from initial 34 x $10^3$/µl.

The patient was discharged on warfarin with INR in therapeutic range. Upon outpatient follow-up, patient's platelet count continued to improve to 134 x $10^3$/µl, 230 x $10^3$/µl, 202 x $10^3$/µl and 161 x $10^3$/µl on weekly CBC checks.

## Discussion

This patient had normal platelet count before rivaroxaban treatment. After 6-weeks of treatment with rivaroxaban, her platelet count decreased to critically low level, and platelet count recovered upon discontinuing rivaroxaban.

Other causes of thrombocytopenia, including consumption coagulopathy, HIT, were excluded. According to the George criteria for assessing drug induced thrombocytopenia, the patient met level of evidence II for DITP.[2] The incidence of drug induced immune thrombocytopenia (DITP) is about 10 persons per million annually.[3]

Six distinct pathogenic mechanism of DITP have been identified,[4] some involved production of antibodies against platelet. The mechanism of Rivaroxaban induced thrombocytopenia is unknown. Thrombocytopenia during anticoagulation therapy may lead to life-threatening hemorrhage. Close monitor of hemoglobin level and platelet count are crucial for early detection of thrombocytopenia and occult hemorrhage to avoid severe hemorrhagic complications.

## References

1. Pop M.K., Farokhi F., Iduna L., et al. Drug-induced thrombocytopenia after anticoagulation with rivaroxaban (2018) *American Journal of Emergency Medicine*, 36 (3) , pp. 531.e1-531.e2.
2. Arepally GM, Ortel TL. Heparin-induced thrombocytopenia. N Engl J Med. 2006;355(8):809-817.
3. Hirsh J, Bauer KA, Donati MB, et al. Parenteral anticoagulants: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th Edition). Chest 2008; 133:141S.
4. Van den Bemt PM, Meyboom RH, Egberts AC. Drug-induced immune thrombocytopenia. Drug Saf. 2004; 27:1243–52.