A Case of Puerperal Pulmonary Embolism

Reshma V.P.[1]* and Rajeev Chatanath[2]

[1]Department of Obstetrics and Gynecology, NMC Speciality Hospital, Muscat, Oman

[2]Department of Internal Medicine, NMC Speciality Hospital, Muscat, Oman

Received: 15 December 2023

Accepted: 22 February 2024

*Corresponding author: reshmavp0@gmail.com

DOI 10.5001/omj.2026.26

Abstract

Venous thrombo embolism remains to be one of the leading cause of direct maternal death. Here, we have a case of puerperal pulmonary embolism presented on post-operative day 6 following an emergency caesarean section. She is a 33-year-old lady with history of anemia and was treated with low molecular weight heparin overlapped with warfarin. Even with 15 mg warfarin, desired INR (International Normalized Ratio) was not achieved. Hence, after detailed counselling and confirmation that she is not breast feeding, Direct Oral Anticoagulant (DOAC) Rivaroxaban was started. Patient's condition was symptomatically and radiologically improved. Lupus Anticoagulant was initially found positive and further to Rivaroxaban stoppage repeat test was found to be negative. The probable triggers for thrombosis in this case may be emergency caesarean and anemia. Regarding the safety of DOAC, as a maintenance treatment in puerperium in a non-lactating woman requires further studies. There can be false positive Lupus anticoagulant report while on Rivaraxoban. More Randomised control Trials are needed regarding safety of DOAC in puerperium.

Keywords: Pulmonary Embolism; Puerperium Anticoagulants; Warfarin; Heparin.

Introduction

Venous thrombo embolism remains as one of the leading causes of direct maternal death. Puerperium is the time of highest risk with estimates of relative risk approximately 20-fold.[1] Venous thrombo embolism during pregnancy and puerperium can be one of the presenting features of Anti Phospholipid Antibody (APLA) Syndrome. APLA syndrome in pregnancy and puerperium can give rise to diagnostic and therapeutic challenges.

Case Report

This is a case of 33-year-old lady, mother of two children, both born by emergency caesarean section. She was presented on post-natal day 6 following second caesarean with progressively increasing breathlessness (from 4th day post-partum) orthopnoea and an atypical chest pain.

During the pregnancy, she had nutritional Iron deficiency from 5th month onwards and was on Iron supplements. She was admitted with labor pains on the 38th week. During admission, there was single recording of high blood pressure with no impending symptoms and the blood investigations were normal except for hemoglobin 10 g/dL. Emergency cesarean section was done in view of fetal distress. No intra operative or post-operative complications were identified. Intra operative blood loss was about 200 mL. As patient was ambulant, she was discharged on post-natal day 3 with low molecular weight heparin prophylactic dose, hematinics and oral antibiotics.

When she was presented with breathlessness on post-operative day 6, her blood pressure was 160/90 mm of hg. She was given Amlodipine for the blood pressure. Her chest was clear and O_2 saturation was normal. ECG and Chest X Ray was normal, Troponin-I was negative and Echo showed mild to moderate pulmonary hypertension with normal biventricular function. CT pulmonary angiogram (CTPA) was done as V/Q (ventilation perfusion scan) was not available. CTPA showed thrombus 1.6 × 1 cm in left inferior lobar pulmonary artery extending in to left inferior lobar segmental branches [Figure1]. Venous Doppler of both lower limbs were normal.

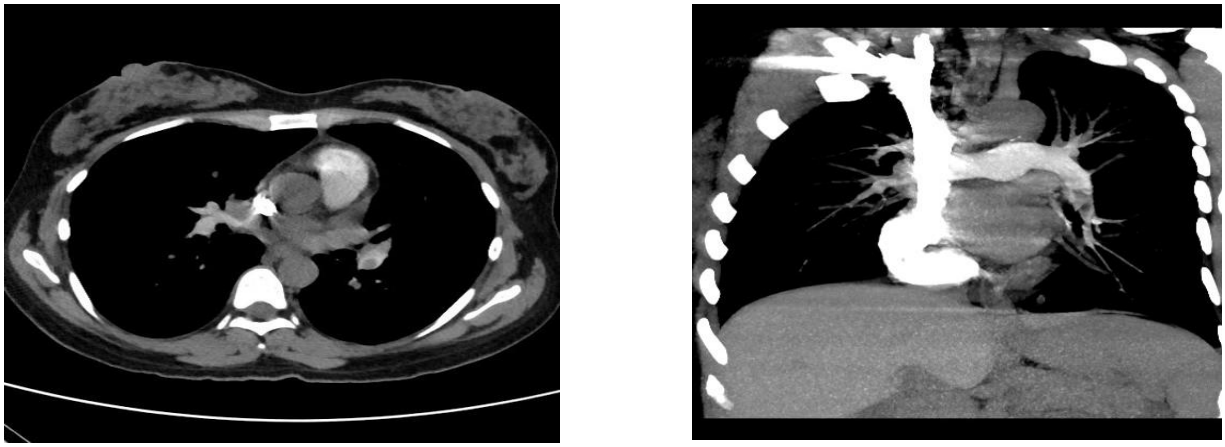

Figure 1: Axial section of CT pulmonary angiogram showing thrombus in left interior lobar pulmonary artery. MIP image, coronal section showing filling defect in left inferior pulmonary artery.

She was started with low molecular weight heparin according to body weight in therapeutic dose overlapped with warfarin 5mg. As the INR was persistently staying at 1.1, warfarin dose increased to 10mg and later to 15mg. Patient stopped breast feeding as the baby was refusing to suck breast probably due to nipple confusion as a result of early introduction of bottle feeds. Novel anticoagulant Rivaraxoban (Direct Oral Anticoagulant (DOAC) at a dose of 15mg twice daily was started after appropriate counselling.

25 days after Rivaraxoban (on 45th day post-partum), repeat Echo showed no pulmonary artery hypertension and left ventricular function was found normal. Hence Rivaraxoban continued for 3 weeks (twice daily) and 20mg once daily thereafter. On 53rd day of post-partum, Anti phospholipid antibody (APLA) testing was done following positive result of ANA. APLA testing showed positivity for lupus anticoagulant and other antibodies were negative. Systemic Lupus Erythematosus (SLE) specific antibody Anti DsDNA was found positive. After 3 months of the first test, APLA testing was repeated after stopping Rivaraxoban for 2 weeks. Test result was negative including lupus anticoagulant. ANA and Anti DsDNA remained positive even though no other features of SLE.

Discussion

The absolute incidence of venous Thrombo embolism (VTE) in pregnancy is about 1 in 1000. Risk of VTE during pregnancy is 4-5 times higher than non-pregnant. Even though VTE can occur at any stage of pregnancy, puerperium is the time of highest risk.[2]

There are many risk factors for VTE including pre-existing risk factors, obstetric and transient risk factors. In this case, emergency cesarean section and nutritional anemia must have been the probable triggers for VTE. Patient was presented with symptoms of breathlessness. Even though clinical examination, ECG, chest X ray were normal, high index of suspicion and worsening of symptoms helped in clinching the diagnosis.

APLA syndrome is one of the acquired thrombophilia syndromes (leading to arterial, venous, or micro vascular thrombosis) or obstetric morbidities due to the presence of persistent anti phospholipid antibodies. Revised Sapparo

criteria (Sydney 2006) used for diagnosis of APLA syndrome needs one clinical and one lab parameters to be positive. Antibodies need to be retested after 12 weeks to confirm the diagnosis. In this case, even though initially lupus anticoagulant was positive while on DOAC, repeat testing after 3 months (after stopping DOAC for 2 weeks) showed it to be negative. So according to Sydney criteria, APLA syndrome was ruled out as a cause for pulmonary embolism.

In a review published in British journal of Hematology by Deepa R.J. Archillage,[3] Mike Laffran shares a possibility of Lupus anticoagulant estimation being false positive while on DOAC. (Merimann et al 2011). A possible method to detect Lupus anticoagulant in sample containing factor Xa inhibitor is Taipan snake venom/Ecarin clotting time combination as these tests are insensitive to factor Xa. (Archillage et al 2015). However these tests are not widely available.

The treatment of pulmonary embolism involves using low molecular weight Heparin dose titrated according to the body weight. In this case, patient was given 80mg twice daily. Maintenance treatment may be needed for at least 3-6months. In view of daily injections being difficult, Heparin was overlapped with Warfarin with an initial dosage of 5mg which was increased to 15mg progressively. Even with 15mg warfarin, desired INR was not achieved. According to a case control study[4] regarding warfarin dosage in post-partum period it is found that significantly higher doses of medicine and more number of days are required to reach the desired INR (RCOG GTG 37b). The probable cause may be altered coagulation parameters in pregnancy persisting in puerperium antagonizing warfarin. After discussing with patient regarding the advantages and disadvantages/uncertainties, novel anticoagulants Rivaraxoban was initiated at a dose of 15mg twice daily. Prior to starting Rivaraxoban breast feeding was stopped. Patient had her symptoms fully resolved with rivaraxoban in this case.

Warfarin is a drug with narrow therapeutic index requiring frequent INR monitoring with food and drug interactions. Rivaraxoban is an oral factor Xa inhibitor and a novel anticoagulant (DOAC) indicated for maintenance treatment following venous thrombo embolism in non-pregnant patients as an alternative to traditional Warfarin. Advantages of Rivaraxoban are fixed dose prescription, no requirement of monitoring anticoagulant effect, simplified preoperative management, reduction of major intracranial bleeding and fewer food drug interactions. But, latest RCOG green top guidelines and several recent papers published on Rivaroxaban is not recommending its use in pregnancy or non-lactating lady.[5] No recommendations came out regarding DOAC use in post-partum non-lactating lady. The reason for such uncertainties are lack of RCTS on effect of novel anticoagulants on altered pathophysiology of pregnancy and lactation, and its fetal and neonatal effects.

Conclusion

High index of suspicion is required in any post-partum patient presenting with symptoms of breathlessness. More RCTS and trials are needed regarding the use of direct thrombin inhibitors in puerperium in both lactating and non-lactating mothers. More researches are required in case of tests for diagnosing lupus anticoagulant in patients on DOAC. Further research regarding potential use of DOAC in single antibody positive thrombotic APS is also required.

Compliance with Ethical Standards

Conflict of interest we declare that they have no conflict of interest.

Human Rights Statement

There is no violation of human rights.

Informed Consent

Informed written consent for publication of this article was obtained from patient and her relative.

References

1. Greer IA. Thrombosis in pregnancy: updates in diagnosis and management. Hematology Am Soc Hematol Educ Program 2012;2012:203-207.

2. Jackson E, Curtis KM, Gaffield ME. Risk of venous thromboembolism during the postpartum period: a systematic review. Obstet Gynecol 2011 Mar;117(3):691-703.

3. Arachchillage DR, Laffan M. What is the appropriate anticoagulation strategy for thrombotic antiphospholipid syndrome? Br J Haematol 2020 Apr;189(2):216-227.

4. Brooks C, Rutherford JM, Gould J, Ramsay MM, James DK. Warfarin dosage in postpartum women: a case-control study. BJOG 2002 Feb;109(2):187-190.

5. RCOG Green top guideline 37a & 37b.