

Postpartum blood transfusion and hemorrhage as independent risk factors for venous thromboembolism

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The Swedish thromboprophylaxis guideline for pregnancy.

Riskpoints for venous thromboembolism (VTE) are added to form a total riskscore

Riskscore 1 = 5 fold increased risk, riskscore 2 = 25-fold etc..

Riskpoints			
1p	2p	3p	≥4p ^b High risk
Het FV Leiden mutation	Prot S def	Hom FV Leiden	Prior VTE
Het protrombin mutation	Prot C def	Hom Protrombin	APS utan VTE
Age >40 år	Immobilization ^d	Dubble mutation	(OHSS ^e)
Obesity (BMI ≥30) ¹			
Heredity for VTE ^c			
Inflammatory bowed disease			
Hyperhomocysteinemia ²			Very high risk ^b
Other large risk factor			cont anticoagulation
Preeclampsia ^f			Antitrombine def
Abruptio ^g			repete VTE
Cesarean section ^f			APS with VTE
RBC transfusion^f			

Het = Heterozygot, Hom = Homozygot, VTE = venous thromboembolic event

APS = Antiphospholipid syndrome, Prot = protein, FV = faktor V, # Only postpartum

RBC = Red blood cell

Conclusion:

We found RBC transfusion, but not postpartum hemorrhage alone, to be an independent risk factor for postpartum venous thromboembolic event and propose that it should be included in the thromboprophylaxis algorithm during pregnancy. We have included postpartum red blood cell transfusion in the Swedish national thromboprophylaxis algorithm for pregnancy.

Introduction:

The risk of venous thromboembolism (VTE) is increased by a factor 5 to 10 during pregnancy, and by a factor of 20 during the postpartum period, compared to non-pregnant women. Profuse postpartum hemorrhage (PPH) and red blood cell (RBC) transfusion have been suggested to be associated with VTE. The aim of this study was to determine if postpartum hemorrhage and red blood cell transfusion are independent major risk factors for VTE.

Methods:

Women who gave birth in the Stockholm area between 1999 and 2002 were included, i.e., before the implementation of guidelines for thromboprophylaxis in pregnancy. In this population-based cohort study data from the Swedish Medical Birth Registry was linked to the National Discharge Registry and to the Stockholm transfusion database. Cases with VTE were identified as well as the patient's transfusion history. The main outcome was an assessment of RBC transfusion and PPH as independent risk factors for postpartum thrombosis, analyzed in logistic regression models.

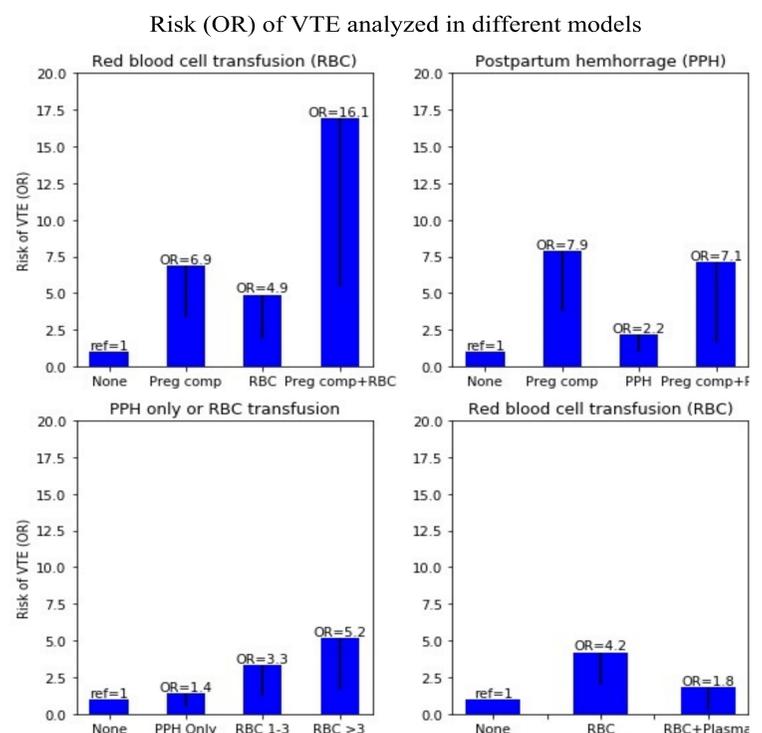


Figure 1 Odds ratios (OR) and minus 95% confidence interval for the different regression models (1,2,4,5 in manuscript) in analyzing risk factors for postpartum venous thromboembolic events (VTE). Ref = reference, Preg com = Pregnancy complication (preeclampsia and/or abruptio placentae).

Results:

Out of the 82,376 deliveries, 56 cases of postpartum VTE were identified (0.7‰). Compared to the control group, the risk of VTE increased with the number of RBC transfusions: 1 to 3 units (OR = 3.3, 95% CI 1.2–8.9) and > 3 units (OR = 5.2, 95%CI 1.7–16.1), but PPH alone was not found to be a major risk factor (OR = 1.4, 95% CI 0.5–3.5).

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The authors declare no conflict of interests



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