Bleeding news

Coagulation management and transfusion in massive postpartum hemorrhage. Review.

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INTRODUCTION

Postpartum hemorrhage (PPH) is still the most common cause of maternal death. It has gone significantly down over the last 25 years, but it is still around 16-27%.

DEFINITION OF POSTPARTUM HEMORRHAGE (PPH)

It is defined by the **amount of blood loss**. The existing definitions are very heterogeneous (≥ 500 mL or ≥ 1000 mL or clinical signs of hypovolemia or depending on the mode of delivery).

PATHOPHYSIOLOGY OF PPH

The **late stages of pregnancy** entail a number of prothrombotic changes to prevent PPH: ↑ coagulation factors, mostly fibrinogen (3.7-6.2 g/dL) and ↓ fibrinolysis. In contrast, there is a somewhat low platelet count due to dilution caused by plasma expansion.

From a pathophysiological standpoint, **PPH is multifactorial, due to "the 4 Ts"**: uterine atony (**T**one), first trigger in 80% of cases, **T**issue (retention of conception products), **T**rauma (injuries in the delivery channel) and coagulation alterations (**T**hrombin). Furthermore, a number of factors favor it (multiparity, cesarean section, preeclampsia, and maternal age > 35).

It must be noted that early **coagulopathy due to a factor deficiency is highly uncommon in PPH**—except for cases of amniotic fluid embolism, placental abruption, preexisting.

GENERAL CONSIDERATIONS ON THE MANAGEMENT OF COAGULOPATHY

First, identifying the cause of bleeding and administering uterotonics. **Second**, treating **acidosis** (pH >7.2g/dL), **hypothermia** (>36.5°C), and **hypocalcemia** (>1.16mmol/L). Maintaining **Hb ≥ 8g/dL**, through a transfusion of packed red blood cells (PRBC) or autologous blood salvage (1C). Blood salvaging is mainly used in cesarean section deliveries.

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TRANEXAMIC ACID (TXA)

The effectiveness of TXA in the **treatment** of PPH was evidenced by the **WOMAN** clinical trial (2017), which showed a decrease in mortality due to bleeding. However, the **TRACES** clinical trial (2022) could to prove this. The purpose of this trial was to determine the optima dose of TXA (1g, 0.5g or placebo). It only proved a decrease of fibrinolysis with 1g of TXA.

The effectiveness of TXA in **prophylaxis** of PPH was evidenced by the TRAAP-2 trial (delivery by cesarean section, with a 100 mL decrease in bleeding!), but not by the TRAAP trial (vaginal delivery). This is why many guides do **not** recommend the **prophylactic** use of TXA.

TRANSFUSION

Generally speaking, it is recommended to maintain an **Hb of 7-9 g/dL and platelets of 75-100x10^9/L.**

The authors of this review recommend high transfusion ratios [4:4:1= CH:FFP (frozen fresh plasma):platelets] at the start of PPH. However, I believe **4:2:1** ratios may be considered, since factor loss is uncommon in the early stages of PPH.

ROLE OF VISCOELASTIC TESTS IN PPH

Validated to guide the administration of fibrinogen concentrate (FC). It should be administered when **FIBTEM A5 < 12 mm**, which is equivalent to fibrinogen < 2 g/L.

However, the value of EXTEM CT is not as validated to guide the administration of coagulation factors. The authors of this review recommend the administration of FFP (15-20 mL/Kg) when **EXTEM CT > 75 seconds.** I believe that the administration of prothrombin complex concentrate (PCC) may be considered instead of FFP, given it is faster and requires less volume, unless a pre-existing coagulopathy is suspected.

FIBRINOGEN

Low levels of fibrinogen are the most significant individual factor in the severity of PPH. Recent studies show that fibrinogen < 2 g/L implies a 12-fold increase in the odds of bleeding. The recommended dose of FC is 30-60 mg/Kg, considering that 0.5 g of fibrinogen increase the maximum clot strength in the viscoelastic test by 1 mm (patient weight: 70 Kg).

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FACTOR REPLACEMENT

The authors of this review advise against correcting coagulopathy with **PCC**, since there is little evidence in this context. However, sites in favor recommend doses of 20-30 UI/Kg and guiding the administration with a viscoelastic test.

The role of **factor XIII** is discussed as a clot stabilizer. Recent studies show that a decrease in its activity (< 50%) is connected to PPH. Therefore, some guides mention it may be administered in cases of massive bleeding (30 UI/Kg).

Recently, the European Medicines Agency has approved the administration of factor **VIIa** in PPH. They say it should be used on an individual basis, as a last resort (60-90 µg/Kg).

CONCLUSION

CORRECTION	ANTIFIBRINOLYTIC	DIAGNOSIS AND TRANSFUSION	TARGETS	REFRACTORY BLEEDING
Temp.>36.5 ºC pH > 7.2 Ca 2+ > 1.6 mmol/L Considering autologous transfusion	TXA 1 g	VISCOELASTIC test (VET) LABORATORY test (PL) 1st transfusion: 4:4:1 - 4:2:1 Following transfusions guided by VET and/or PL	Hb 7-9 g/dL Platelets 75-100x10^9/L Fibrinogen >2-2.5 g/L FIBTEM A5 > 12 mm EXTEM CT > 75 seg PT and/or aPTTP < 1.5 Factor XIII > 50%	Considering F VIIa