Haemostasis during pregnancy, labour and postpartum haemorrhage

AKADEMISK AVHANDLING

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Avhandlingen baseras på följande delarbeten:

I. Karlsson O, Sporrong T, Hillarp A, Jeppsson A, Hellgren M.
Prospective longitudinal study of Thromboelastography and standard hemostatic laboratory tests in healthy women during normal pregnancy.
Anesth Analg 2012;115:890-8.

II. Karlsson O, Jeppsson A, Hellgren M.
A longitudinal study of Factor XIII activity, fibrinogen concentration, platelet count and clot strength during normal pregnancy.
Thromb Res 2014;134:750-752

III. Karlsson O, Jeppsson A, Hellgren M.
Major obstetric haemorrhage: monitoring with thromboelastography, laboratory analyses or both?
Int J Obstet Anesth 2014;23:10-17.

IV. Karlsson O, Jeppsson A, Thornemo M, Lafrenz H, Rådström M, Hellgren M.
Fibrinogen plasma concentration before delivery is not associated with postpartum haemorrhage: a prospective observational study.
Submitted

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ABSTRACT

Background: Haemostatic disorders are common in obstetric complications and may result in more severe complications if not detected. There is limited knowledge about viscoelastic methods, fibrinogen and Factor XIII and how they are related to each other during pregnancy and postpartum haemorrhage. The aims of this thesis were (I) to obtain knowledge about physiological changes in thromboelastography (TEG®) variables and how they relate to haemostatic laboratory methods during normal pregnancy and 8 weeks postpartum, (II) to describe changes in Factor XIII activity, fibrinogen concentration, platelet count and their respective associations to clot strength during normal pregnancy, (III) to compare TEG® and laboratory analyses during major obstetric haemorrhage and (IV) to assess whether fibrinogen concentration at admission, before labour, is associated with severe postpartum haemorrhage.

Methods: In two prospective observational studies, TEG® and haemostatic laboratory analyses were studied longitudinally during normal pregnancy and postpartum. In one prospective study, the same methods were used during postpartum haemorrhage. Finally, fibrinogen concentration was determined before delivery and postpartum in order to assess whether there was any association to bleeding postpartum.

Results: TEG® demonstrated increased coagulability and decreased fibrinolysis during pregnancy. Factor XIII activity and platelet count were lower during pregnancy, while fibrinogen concentration was higher. Clot strength was higher and correlated with fibrinogen concentration and platelet count, but not with Factor XIII activity. During major obstetric haemorrhage (>2000 mL), impaired haemostasis was demonstrated with both TEG® and laboratory analyses. TEG® provided faster results, advantageous in the setting of ongoing obstetric haemorrhage. Fibrinogen concentration did not decrease during normal labour. Fibrinogen concentration at admission, before labour, did not predict the severity of postpartum haemorrhage. Excessive postpartum bleeding was mainly due to obstetric complications.

Conclusion: During normal pregnancy, increased coagulability and decreased fibrinolysis were observed. During postpartum haemorrhage, haemostasis was rapidly impaired. Prepartal fibrinogen concentration did not predict bleeding postpartum. Monitoring haemostasis in cases of obstetric complications is fundamental for providing good obstetric care.

Keywords: pregnancy, labour, postpartum haemorrhage, thromboelastography, haemostatic laboratory analyses, fibrinogen, Factor XIII

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