High platelet activity in hypothermic patients with acute ST-elevation myocardial infarction

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On behalf: Group Irene Lang

Topic(s): Thrombosis, Bleeding

Citation: Cardiovascular Research (2018) 114 (Supplement 1), S49

Introduction

Myocardial infarction (MI) is one of the leading causes of death and morbidity worldwide. Therapeutic hypothermia (TH) is used in patients with cardiac arrest and infants suffering from birth asphyxia. Cardioprotective mechanisms of TH in MI are in discussion.

Effects of TH on platelets and hemostasis in-vivo are still to be clarified, especially in MI patients.

Purpose

In this study, platelet function and hemostasis under TH in myocardial infarction patients have been evaluated.

Methods

The STATIM (Strategic TArget Temperature management In Myocardial Infarction) study investigated the impact of TH during STEMI, aiming at a temperature below 35°C during reperfusion. All patients received prasugrel and acetylsalicylic acid. 120 patients underwent a 1:1 randomization and biological samples were immediately processed for laboratory multiplate, ELISA and flow cytometry analysis.

Results

Platelet multiplate analysis revealed increased responsiveness (TRAP-test) of platelets from cooled patients. Plasma levels of ADP, an important in-vivo platelet stimulus, were found to be significantly elevated in patients receiving TH.

We observed significant longer bleeding times in TH patients, which were accompanied by more clinical bleedings, whereas platelet count and fibrinogen were not affected by TH.

In patients treated with TH, mean platelet volume was identified as an independent predictor of bleeding events.

Conclusion

Our in-vivo study of MI patients revealed that TH leads to high platelet responsiveness and clinical bleeding events, which can be predicted by the mean platelet volume. Correlation with outcome data will identify the clinical importance of these findings regarding ischemia and cardiac function.
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