Comparison of HMGB1 levels between bone marrow and peripheral blood stem cell donation

F. Wenzel¹, V. Börger¹, J.C. Fischer¹, R. Sorg¹

Abstract

Introduction:
High Mobility Group Box chromosomal protein 1 (HMGB1) is a nuclear DNA-binding protein acting as a proinflammatory cytokine. It is released from necrotic cells, activated macrophages dendritic cells and platelets. HMGB1 can induce prolonged inflammation and organ failure. Due to the preparation technique haematopoietic stem cell products consist not only of CD34+ cells but also of a mixture of different cell types, e.g. after GM-GCSF stimulation of a high addition of granulocytes, showing storage induced alterations. Therefore we evaluated HMGB1 levels in apheresis- and bone marrow (BM)-derived stem cell products.

Material and Methods:
In healthy BM donors (n = 3) and peripheral stem cell (PBSC) donors (n = 3), HMGB1 levels were determined in plasma samples (anticoagulated by EDTA (1.8 mg/mL)) of peripheral blood (PB) as well as in the respective stem cell product immediately after preparation and 24h after storage. HMGB1 was measured by an commercially available ELISA-Kit.

Results:
In the peripheral blood, HMGB1 levels of BM donors were in a lower range (5.6 ng/mL ± 1 ng/mL) than the levels of PBSC donors (12.4 ng/mL ± 6.3 ng/mL). In contrast, BM-derived stem cell products showed immediately after preparation higher HMGB1 levels (212 ng/mL ± 93 ng/mL) in comparison to the respective PBSC products (74 ng/mL ± 26 ng/mL). After 24h storage an accumulation of HMGB1 could be observed in the stem cell products, independent on the preparation technique and leading to comparable HMGB1 concentrations (228 ng/mL ± 80 ng/mL (BM) vs. 247 ng/mL ± 74 ng/mL (PBSC)).

Conclusions:
During haematopoietic stem cell preparation clear alterations of HMGB1 levels could be observed. In the peripheral blood of GM-GCSF-stimulated PBSC donors HMGB1 levels were found within a higher range in comparison to BM donors. However, after storage of the stem cell products an accumulation of HMGB1 occured independently on the preparation technique.