**Myleid cells as diagnostic and prognostic biomarker in abdominal aortic aneurysms**

Johannes Klopf

Background: The abdominal aortic aneurysm (AAA) is a disease that is often asymptomatic and can rapidly lead to death in the event of a sudden vessel rupture. Several risk factors are already known, such as age, sex, smoking behavior, genetic predisposition or metabolic disorders. Currently the diameter of the AAA is still the most important parameter in the decision making about the further medical treatment. A central component of AAA pathogenesis is inflammation, which is predominantly mediated by myeloid cells, especially monocytes and neutrophils.

Objective: In its entirety, the need for AAA biomarkers, both diagnostic and prognostic, is substantial. The hypothesis of this study was that the local inflammatory activity may be reflected in possible alterations in the frequency and distribution of circulating monocyte and neutrophil subsets. Therefore, it was aimed to measure monocyte and neutrophil subsets together with standard laboratory parameters in the blood of AAA patients during the course of disease and aneurysm repair.

Methods: Monocyte and neutrophil subsets were measured by flow cytometry in peripheral blood samples of 23 AAA patients before and after surgery and of 58 AAA patients without current indication for surgery. These patients were monitored at 6-month intervals with serial blood sampling and abdominal computed tomography angiography.

Results: Monocyte-platelet aggregates (*P*=0.008), circulating monocytes (*P*=0.003), and their distinct intermediate subset (*P*=0.007), as well as the combined population of CD16+ monocytes (*P*=0.039), were able to predict fast AAA growth. No significant alterations in the frequency and distribution of circulating myeloid cell subsets were found after elective AAA surgery, but neutrophil-platelet aggregates (*P*=0.009), and percent circulating neutrophils were significantly elevated (*P*=0.008) after the intervention.

Conclusion: This study indicates that local inflammatory activity in AAA patients induces alterations in the frequency and distribution of circulating myeloid cells, which may serve as prognostic biomarkers to predict rapid disease progression.