Results from the CAMI1 Study: Selective CRP apheresis as a new treatment option in acute myocardial infarction

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Topic(s):
ST-Elevation Myocardial Infarction (STEMI)

Citation:
Background: Inflammation is increasingly recognized as an important pathogenic feature in cardiovascular disease. In patients with STEMI, C-reactive protein (CRP), the prototype human acute phase protein, is a marker of poor prognosis and independently predicts 30-day mortality. In STEMI, CRP may indeed be intimately involved in myocardial damage by activating the complement system in the ischemic tissue. In animal experiments, CRP removal after STEMI reduces infarct size and results in a significantly better left ventricular ejection fraction (LVEF). Recently, in the multi-center matched-control pilot study on CRP apheresis in Acute Myocardial Infarction (CAMI1), a newly designed CRP adsorber has been demonstrated to efficiently and selectively lower CRP plasma levels in humans. Here, we present preliminary data of the ongoing trial.

Methods: Up to the present day, 67 STEMI patients were enrolled in the study following complete coronary revascularization. 32 patients received CRP apheresis, whereas 35 patients treated by standard protocols served as controls. CRP apheresis started 24 ± 12 h and 48 ± 12 h after onset of symptoms. In case of a rapid increase in CRP plasma levels following the 2nd session, a 3rd session was carried out another 24 h later. In each apheresis session, 6000 ml plasma was treated via peripheral venous access. Primary study endpoint was myocardial infarction size as determined by Cardiac Magnetic Resonance Imaging (MRI) 5 ± 3 days after STEMI.

Results: Apheresis sessions were well tolerated with no relevant side effects. Peak CRP plasma levels after STEMI ranged from 12 mg/l to 279 mg/l. The peak CRP level after AMI can be calculated precisely with at 2-3 CRP quantifications during the first 24 h after the onset of symptoms. The regression coefficient for this analysis is 0.95. This mathematical step allows for the comparison of the CRP-apheresis group and the controls on the basis of their individual CRP peak levels. The statistical evaluation shows that the apheresis patients no longer correlate with the control with regard to the endpoints infarct size, LVEF, longitudinal strain and circumferential strain. They perform significantly better at all endpoints. The CRP apheresis reduced the development of myocardial damage.

Conclusions: Here, an unequivocal association between infarct size and CRP is demonstrated for the first time. CRP apheresis following STEMI is feasible and safe. Our preliminary results in a small cohort show a significant beneficial effect of CRP apheresis on myocardial infarction size and wall motion. Selective CRP apheresis may emerge as a new therapeutic approach in the treatment of acute myocardial infarction.
Abstract: Results from the CAMI1 Study: Selective CRP apheresis as a new treatment option in acute myocardial infarction

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