Monocyte subset distribution predicts survival in patients with acute heart failure

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BACKGROUND

Activation of the innate immune system contributes to the pathogenesis of acute heart failure (AHF). As key regulators of innate immunity, monocytes may play a crucial role in the development of this disease. Monocytes are a heterogeneous cell population that can be divided into at least three cell populations: Classical monocytes (CM; CD14++CD16−), intermediate monocytes (IM; CD14++CD16+CCR2+) and non-classical monocytes (NCM; CD14+CD16++CCR2−).

PURPOSE

The aim of this study was to analyze whether monocyte subset distribution is associated with 30-day survival in patients with AHF.

METHODS

We included 90 consecutive patients with AHF (33% with cardiogenic shock, 21% with acutely decompensated HF and 46% of patients suffered from AHF after cardiac arrest). Blood was taken at admission and after 72 hours and monocyte subset distribution was analyzed.

RESULTS

Mean age was 62.1 ± 16.0, 76.7% of patients were male and median NT-proBNP levels were 4986 (1525 – 23842) pg/mL. 30-day survival was 64.4%. At admission, no association between monocyte subsets and outcome was seen. However on day 4, increased levels of IM (9.4 (4.0-13.8) % vs. 4.3 (2.1-7.9) %; p=0.02, respectively) and lower levels of CM were predictive of 30-day mortality (86.8 (77.5 – 88.9) % vs. 90.5 (84.3 – 92.9), p= 0.02, respectively), while the NCM proportion was not associated with mortality. Risk of dying was increased 10.6-fold in the lowest tertile of CM and 9.5-fold in patients in the lowest IM tertile (p<0.05 for both).

CONCLUSION Circulating monocyte subsets are associated with 30-day mortality in patients with AHF requiring ICU admission. Activation status of the innate immune system as reflected by monocyte subset distribution may play a major role in pathophysiology and outcome in this patient cohort.