MONOCYTE SUBPOPULATION COUNTS AND TNF ALPHA ASSOCIATIONS WITH CLINICAL OUTCOME POST ST ELEVATION MYOCARDIAL INFARCTION

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Background Monocytes are implicated in the initiation and progress- tion of the atherosclerotic plaque contributing to its instability and rupture. Although peripheral monocytosis has been related to poor
clinical outcome post ST elevation myocardial infarction (STEMI), only scarce information is available of mechanisms of this association. Tumour necrosis factor alpha (TNFα) is a key cytokine in the acute phase inflammatory response, and it is predominantly produced by inflammatory macrophages. Little is known about TNFα association with circulating monocyte subpopulations post STEMI.

**Method**
A total of 142 STEMI patients (mean age 62±13 years; 72% male) treated with percutaneous revascularization were recruited with blood samples obtained within first 24 hours from the onset and on day 10-14. Peripheral blood monocyte subpopulations were enumerated and characterized using flow cytometry after staining for CD14, CD16 and CCR2 and were defined as: CD14++CD16-CCR2+ (Mon1), CD14++CD16+CCR+ (Mon2) and CD14+CD16++CCR2- (Mon3) cells. Plasma levels of TNFα were measured by enzyme-linked immunosorbent assay (ELISA, Peprotec system, UK). Major adverse cardiac events (MACE), defined as recurrent STEMI, new diagnosis of heart failure and death were recorded at follow up, mean of 164±134 days.

**Results**
TNFα levels were significantly higher 24 hours post STEMI, compared to day 14 (paired t-test, p <0.001) with day 1 levels weakly correlated with total monocyte count as well as Mon1 (Spearman’s correlation, r=0.19, p=0.02 and r=0.22, p=0.01, respectively). There was no correlation between TNFα and Mon2 or Mon3 subpopulations. TNFα levels were significantly higher in patients with a recorded MACE (n=28, Mann-Whitney test, p<0.001) (figure 1).

**Conclusion**
In acute STEMI concentration of TNFα correlate with Mon1 subset count only and are higher in patients with MACEs. These data support the role of the ‘classical’ Mon1 subset in the inflammatory shift and negative outcome in STEMI. This also sheds light on the function of the newly described Mon2, which appears not to have an inflammatory role.

![Figure 1: TNFα levels in STEMI patients with and without MACE.](image-url)