Table 1 Monocyte subpopulations and correlation with ejection fraction

Monocytes mean florescence intensity (cells/μl)	Left ventricular ejection fraction (%) at 6 months post infarct		Left ventricular ejection fraction (%) at 6 months post infarct	
	β value	p Value	β value	p Value
Total Mon	0.31	p<0.001	0.36	0.009
Mon 1	0.02	0.02	0.07	0.62
Mon 2	−0.28	0.001	−0.42	0.002
Mon 3	−0.27	0.001	−0.18	0.21

Background Monocytes are implicated in the initiation and progression of the atherosclerotic plaque contributing to plaque instability and rupture. Little is known about the role of the three phenotypically and functionally different monocyte subpopulations in determining ventricular remodelling following ST elevation myocardial infarction (STEMI). Mon1 are the 'classical' monocytes with inflammatory action, whilst Mon3 are considered reparative with fibroblast deposition ability. The function of the newly described Mon2 subset is yet to be fully described.

Method STEMI patients (n=196, mean age 62±13 years; 72% male) treated with percutaneous revascularization were recruited within the first 24 h post-infarction. Peripheral blood monocyte subpopulations were enumerated and characterised using flow cytometry after staining for CD14, CD16 and CCR2. Phenotypically, monocyte subpopulations are defined as: CD14++CD16-CCR2+ (Mon1), CD14++CD16+CCR2+ (Mon2) and CD14+CD16++CCR2- (Mon3) cells. Transthoracic 2D echocardiography was performed within 7 days and at 6 months post infarct to assess ventricular volumes, mass, systolic, and diastolic functions as well as strain and strain rate.

Results Using linear regression analysis higher counts for Mon1, and lower counts for Mon2 and Mon3 were significantly associated with the baseline left ventricular ejection fraction (LVEF) within 7 days post infarct (table 1). At 6 months post STEMI lower counts of Mon2 remained positively associated with a decrease in LVEF at completion of remodelling (p=0.002).

Conclusion Peripheral monocytes of all three subsets correlate with LVEF after a myocardial infarction. High counts of the inflammatory Mon1 are associated with the reduced baseline ejection fraction post infarction. After remodelling, the convalescent ejection fraction was independently predicted by monocyte subpopulation 2. As lower counts depicted negative ventricular remodelling, this suggests a possible myofibroblast deposition and angiogenesis role for the newly described intermediate monocyte subpopulation Mon2 as opposed to the previously anticipated inflammatory role.

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MONOCYTE SUBPOPULATION COUNTS AND ASSOCIATIONS WITH LEFT VENTRICULAR EJECTION FRACTION POST ST ELEVATION MYOCARDIAL INFARCTION

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