Correlation between circulating angiogenic cell mobilizations and recovery of coronary flow reserve in patients with acute myocardial infarction

Hansaem Jeong¹, Soon Jun Hong¹, Jae Hyung Park¹, Jong Ho Kim¹, Seung Cheol Choi¹, Chul Min Ahn¹, Jae Sang Kim¹, Do-Sun Lim¹
¹Cardiovascular Center of Korea University Anam Hospital, Seoul, Korea

Background: Mobilization of circulating angiogenic cells in AMI would be still controversial. The correlations between circulating angiogenic cell mobilizations and improvement of microvascular integrity were investigated in patients with acute myocardial infarction during 8-month follow-up.

Methods: Coronary flow reserve (CFR) was measured at baseline and at 8 months with intracoronary Doppler wire. Serial changes in the absolute numbers of circulating angiogenic cells such as CD34+, CXCR4+, CD117+, CD133+ and C-met+ were measured at baseline, day 1, day 5 and at 8 months.

Results: The absolute numbers of circulating CD34+, CXCR4+, CD117+, CD133+ and C-met+ cells were significantly higher at day 1 than at baseline. Positive correlation was found between the numbers of circulating angiogenic cells for CD34+, CXCR4+, CD117+ and CD133+ cells at day 1 and the changes from baseline in CFR and also found in subgroup of LAD lesions. Cutoff value of changes of CFR at 8 months by ROC curve between circulating CD34+ cell at day 1 and changes of CFR at 8 months was 0. Late-loss showed positive correlation with C-met+ cell and negative correlation with CXCR4+ cell. AUC of ROC curve between late-loss and C-met+ and CXCR4+ cells were 0.825 and 0.962, respectively. Negative correlation was found between changes in hsCRP and sICAM-1 and changes in CFR at 8 months.

Conclusions: The recovery of microvascular integrity after acute ischemic injury was expedited by increases in circulating angiogenic cell mobilization together with greater decreases in inflammatory cytokines and could be predicted by measurement of CFR.