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Bone marrow stem cell adherence into old anterior myocardial infarction: a scintigraphic study using Tl-201 and Tc-99m-HMPAO.

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Abstract

AIM:

The precise localization of bone marrow stem cells (SCs) into the necrotic tissue after intracoronary infusion (ICI) may be important for the therapeutic outcome. This study aims to examine the correlation between Tl-201 and Tc-99m-hexa-methyl-propylene-amine-oxime (HMPAO) images.

METHODS:

Thirteen patients, aged 36-62 years, with an old, nonviable, anterior myocardial infarction (MI) and reduced myocardial contractility (LVEF <40%), underwent ICI of selected CD133(+) and CD133(neg)CD34(+) SCs. One hour after the ICI, SPECT imaging with Tc-99m-HMPAO was performed in all patients and the acquired images were compared with the images obtained during the initial imaging for demonstration of viability (myocardial perfusion imaging with pharmacologic stress and Tl-201). Furthermore, two fused bull's eye images of Tc-99m-HMPAO and Tl-201 rest reinjection were created in six patients and regions of interest were set on Tl-201 and Tc-99m-HMPAO bull's eye images.

RESULTS:

The comparison of the two sets of images revealed an intense accumulation of the SCs in the infarcted area with absence of viability as assessed by Tl-201 reinjection images. In the subset of patients in whom fused bull's eye images were produced, the comparison demonstrated that the percentage of the infarcted area with SCs' adherence was $83.2 \pm 17\%$.

CONCLUSIONS:

Tl-201 images are complementary with the respective Tc-99m-HMPAO ones, revealing a precise localization of SCs in the infarcted area. Tc-99m-HMPAO labeling of SCs is a reliable method for cell monitoring after ICI in nonviable myocardium after an anterior MI.

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