TURUN YLIOPISTO
Läketieteellinen tiedekunta

KIUGEL, MAX:

Dimeric [^{68}Ga]DOTA-RGD Peptide Targeting $\alpha_v\beta_3$ Integrin Reveals Extracellular Matrix Alterations after Myocardial Infarction

Syventävien opintojen kirjallinen työ
Kliininen Fysiologia ja Isotooppilääketiede
Huhtikuu 2017

Purpose: We evaluated a dimeric RGD-peptide, [^{68}Ga]DOTA-E-[c(RGDfK)]$_2$, for positron emission tomography (PET) imaging of myocardial integrin expression associated with extracellular matrix remodeling after myocardial infarction (MI) in rat.

Procedures: Male Sprague-Dawley rats were studied at 7 days and 4 weeks after MI induced by permanent ligation of the left coronary artery and compared with sham-operated controls.

Results: In vivo imaging revealed higher tracer uptake in the infarcted area than in the remote non-infarcted myocardium of the same rats both at 7 days (MI/remote ratio, 2.25±0.24) and 4 weeks (MI/remote ratio, 2.13±0.37) post-MI. Compared with sham-operated rats, tracer uptake was higher also in the remote, non-infarcted myocardium of MI rats both at 7 days and 4 weeks where it coincided with an increased interstitial fibrosis. Standardized uptake values correlated well with the results of tracer kinetic modeling. Autoradiography confirmed the imaging results showing 5.1 times higher tracer uptake in the infarcted than remote area. Tracer uptake correlated with the amount of β_3 integrin subunits in the infarcted area.

Conclusions: Our results show that integrin-targeting [^{68}Ga]DOTA-E-[c(RGDfK)]$_2$ is a potential tracer for monitoring of myocardial extracellular matrix remodeling after MI using PET.

Avainsanat: integriinit, sydäninfarkti, PET, RGD