

## **Automated Quantitation of Infarct Size and Potential Myocardial Salvage Following First Myocardial Infarctions.**

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Infarct size is an important determinate of cardiac prognosis and clinical outcome following a myocardial infarction (MI).

**Objectives:** We investigated the ability of an automated analysis method (3D-MSPECT) to quantitate myocardial infarct size (IFsz) from predischarge rest perfusion images as compared to total peak creatine kinase (CK) enzyme release.

**Methods:** Patients (n = 19) presenting with their first MI entered the protocol and underwent, 1) dipyridamole stress perfusion imaging (DYP) performed within 48 hrs of the onset of chest pain and then 2) submaximal exercise predischarge testing (SMX) using gated  $^{99m}\text{Tc}$  sestamibi imaging (same day protocol). The stress DYP images defined the relative area at risk (AR) for MI and the rest SMX images were used to determine the IFsz. Images were semi-quantitatively scored by two independent observers. Scores were summed by each observer to define the defect score (SDS) for each study. Quantitation of AR and IFsz were determined from the perfusion defect extent and were expressed in grams of myocardium determined from the end-diastolic left ventricular mass. Peak CK enzyme leak, a marker of infarct size, was compared to the automated IFsz using regression analysis. Correlations between each observers SDS and the automated quantitation were determined. Potential salvage of the myocardium was calculated as AR-IFsz and this comparison was made for both the visual and automated methods.

**Results:** The mean CK value for all patients was  $1361 \pm 296$  IU. Quantitated mean AR and IFsz was  $55.2 \pm 9\text{g}$  and  $35.2 \pm 7\text{g}$  respectively, for all patients. SDS for both observers were significantly correlated with the quantitated defects sizes ( $R = .74$  &  $.73$ ;  $p = .0003$  &  $.0005$ ). Infarct size by CK was significantly correlated with the AR and IFsz using the automated method ( $R = .54$  &  $.64$ ;  $p = .017$  &  $.003$  respectively). A good correlation ( $r = .73$ ;  $p = .0005$ ) also was present between the visual and quantitated potential myocardial salvage assessments.

**Conclusion:** Automatically quantified infarct size was directly correlated with the amount of CK leak, a known marker of infarct size, and was also similar to visual assessment of infarct size.