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TP067

Comparison of absolute myocardial blood flow with 13N-NH3 cardiac PET determined by different compartmental models and softwares

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Aim: The absolute myocardial blood flow (MBF) can be determined from a dynamic acquisition that starts simultaneously with the injection of 13N-NH3. Activity in blood and in the myocardium as a function of time after injection serve as input functions to the compartmental model applied for the calculation of the MBF. Several softwares and compartmental models have previously been developed for the calculation. The aim of this study was to compare the MBFs from different softwares and compartmental models. The intraobserver variability was also evaluated. Methods: Five patients diagnosed with coronary artery disease were examined with 13N-NH3 at rest and in stress (10 cardiac PET studies). A listmode acquisition was performed after injection of 555 MBq 13N-NH3. A dynamic study with a duration of 10 minutes (12 images for 10s, 6 images for 30s, 2 images for 60s and 1 image for 180s) were reconstructed with OSEM from the listmode acquisition. The global MBF was determined by the deGrado, Hutchins and Krikovapich compartmental models in the Carimas software (Turku, Finland) and with the Hutchins compartmental model in the syngoMBF software (Siemens). Each evaluation was performed three times to assess the intraobserver variability (determined as (max-min)/mean for each cardiac PET study). Results: The mean value for the first of three evaluations of all patient studies was MBFdeGrado,Carimas=1.8ml/min-g, MBFHutchins, Carimas=1.9 ml/ml-g, MBFKrivokapich,Carimas= 2.3 ml/min-g and MBFHutchins,syngo =1.7ml/min-g. The intraobserver variability, reported as the mean of the percentual deviation, was 9% for deGrado,Carimas; 15% for Hutchins,Carimas; 7% for Krivokapich,Carimas and 8% for Hutchins,syngo.ConclusionsThe mean of the global myocardial blood flow varied between 1.7 and 2.3 ml/min-g for the compartmental models and softwares that were evaluated. The Krivokapich compartmental model in Carimas showed the smallest intraobserver variability but the mean myocardial blood flow deviated from the results from the other methods. The Hutchins compartmental model in syngo showed a smaller intraobserver variability than the same model in Carimas, whichmight be explained by a more automatic image processing in the syngo software.

TP068

Assessing left ventricular dysfunction by the use of three distinct molecular imaging techniques

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AIMS: Left ventricular dysfunction might be assessed using distinct molecular imaging modalities. The most relevant are first pass radionuclide ventriculography (FPRV), multigated radionuclide angiography (MUGA) and gated blood-pool SPECT (GBPS) and are very often used for monitoring chemotherapy-related cardiomyopathy. This work aims to correlate these three molecular imaging techniques. METHODS: 400mg of potassium perchlorate and 20 μg/kg of stannous agent were administered to a group of 30 patients (35-65 years old) 20 minutes before the iv bolus injection of 740-925 MBq of 99mTc. First pass images were acquired in anterior projection immediately after 99mTc injection, in a total of 1.500 frames with 25 msec/frame each. Fifteen minutes later, MUGA images were acquired in left anterior oblique projection for a minimum of 600 cardiac cycles using 24 bins/cycle. Finally, GBPS images were obtained using 24 bins/cycle and 20 cycles/projection in a total of 60 projections acquired over 180° in step-and-shoot mode. All images were acquired with a double-headed gamma camera, equipped with LEHR collimator. Left and right ventricular ejection fraction (LVEF and RVEF) as well as ventricular volumes were calculated. RESULTS: The first subgroup of 14 patients were analyzed. Global LVEF assessed by GBPS showed a good correlation with conventional planar methods (correlation coefficient = 0.87). The average LVEF obtained by planar techniques was 59.7 ± 9.7%, whereas for GBPS was 66.2 ± 10.4%. The correlation coefficient between MUGA and FPRV was 0.92. The average LVEF obtained by FPRV was 56.3 ± 7.5%. The correlation coefficient between FPRV and GBPS was 0.81. CONCLUSION: Results obtained so far suggest a better correlation for LVEF between FPRV and MUGA techniques in comparison to GBPS. Moreover, GBPS provides additional information, since it allows the assessment of RVEF and wall motion, which can be of value in patients with congestive heart failure. The work is still ongoing and the final subjects will be evaluated shortly, with their contribution for the results being added subsequently. Final results will be presented and discussed using the adequate statistical tools.