Influence of SPECT Wide Beam Reconstruction (WBR) in myocardial perfusion scan

Author Block: G. Cantinho[1], H. Pena[1], S. C. Shwartz[2], S. Figueiredo[1], P. Gomes[1], F. Godinho[1];
[1]Atomedical & IMN-FML, Lisboa, PORTUGAL, [2]UltraSPECT, Ltd, Haifa, ISRAEL.

Aim

The WBR™ technology (UltraSPECT, Ltd) is an iterative reconstruction method for resolution recovery. It is based on an accurate modeling of the emission - detection process, including the collimator geometry, detector distance to the patient and more. This optimization is designed to improve image resolution without enhancing noise and optimised specifically for short cardiac perfusion scans.

Our aim was to compare the conventional acquisition and FBP processing with a shorter acquisition and WBR processing.

Material & Methods

We evaluated 20 randomly chosen male patients (73±7kg;10 with myocardial infarction).

At rest and after pharmacological stress, the patients went through two sets of acquisitions by a dual head gamma camera. The conventional protocol(FBP) with 30 views of 40 sec/view was followed by a new SPECT scan of 60 views of 10 sec. Stress scans were gated in both conventional and short scans.

For visual analysis, we considered LV 9 segments. QGS and QPS by Cedar-Sinai was used for quantification scoring (SSS, SRS and SDS) and lesion area evaluation.

Qualitative image analysis was performed, using 4 degrees: very good(*VG*), good(*G*), sufficient(*S*) and bad(*B*) quality.

Statistical analysis with paired Student t-test was used to compare FBP/WBR in all parameters. Correlation coefficients(CC) were also obtained.

Results

Scores analysis(SSS and SRS) don't show statistical differences($p<0.01$) between FBP and WBR, with CC>0.94 for both stress and rest. CC for lesion area was >0.9 for stress and rest, mean values =9±11% and 11±12% for stress; 6.5±9.6% and 7.9±11.7% for rest(p NS), respectively.

Classification of image quality was: *VG*-2 pts, *G*-8 pts and *S*-10 pts for FBP. For WBR: *VG*-13 pts, *G*-7 pts. 5 studies were concordant.

Based on the visual analysis respecting lesions number, we obtained concordant final reports in 16 pts. In 4 pts, the discordant conclusions may be clinically relevant. These pts had AMI, with *S* and *G* image classification in FBP studies, with irreversible lesions and doubtful peri-necrosis ischaemia. In the WBR, all images were considered *VG*, reinforcing the interpretation as lack of ischemia in 3 pts and necrosis with ischemia in the other patient.

Conclusions

These preliminary results show that WBR with halved acquisition time supplies globally better image quality, with consequent increased confidence level in interpretation.

The lack of clinically important discrepancies in SPECT myocardial studies is a good indicator for a reliable method for routine use. And finally, a shorter acquisition time is an advantage for the patients and for us.