Clinical comparison of four minute IQ-SPECT imaging with conventional parallel hole collimated SPECT/CT

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Abstract

**Objectives** The objective of this study was to quantitatively compare attenuation corrected (AC) SPECT using IQ-SPECT performed in four min with conventional parallel hole collimated SPECT/CT performed in 15-20 min.

**Methods** 110 pts referred for indicated SPECT perfusion imaging with Tc-99m tracers were evaluated with AC SPECT. Imaging was performed with both parallel hole collimation using a Siemens Symbia T16 SPECT/CT and the same system with the IQ-SPECT modification employing SMARTZOOM collimators and cardio-centric orbits. Standard SPECT/CT was performed over 180° orbits at 3° increments for 15-20 sec per view into 128x128 matrices and 4.8 mm pixels. Study time was 15-20 min and images were AC using CT images acquired before SPECT with the integrated CT. IQ-SPECT images were acquired over 208° cardio-centric orbits with 17 views per detector for 9 sec per view to 128x128 matrices and 4.80 mm pixels, total study time of 4 min, and corrected for AC. Normal databases were created from 30 low likelihood normal males and 22 low likelihood females. Standard 17 segment scoring and blackout polarmap analyses were employed (Corridor4DM).

**Results** Images were scored from 0 - unacceptable to 4 - excellent. Image quality was similar for the two methods, p=NS. Among 13 low likelihood normals not included in the normal databases, 11 were normal with IQ-SPECT and 12 were normal with standard SPECT/CT (p=NS). There were 14 pts with document coronary heart disease (CHD). The summed stress scores were similar with IQ-SPECT and standard SPECT/CT (13.9±10.2 as 12.4±11.4 respectively, p=NS). Blackout polarmap analysis demonstrated similar results for IQ-SPECT and standard SPECT/CT (27.8±18.7 as 23.9±22.5 respectively, p=NS). Angiographic correlations were similar with a trend to increased sensitivity with IQ-SPECT, 12 versus 8 true positives, p=NS by SSS and 13 versus 9 true positives, p=NS by blackout analyses.

**Conclusions** Quantitative analyses of IQ-SPECT and standard parallel hole collimated SPECT/CT provides images of comparable quality, normalcy and sensitivity.