

Summary

Improvement in Accuracy for Quantitative Assessment of the Regional Cerebral Blood Flow with ^{99m}Tc -ECD

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Mean cerebral blood flow (mCBF) in the slice including the basal ganglia (reference slice) is necessary for the quantification of regional CBF using Patlak plot and BUR methods on ^{99m}Tc -ECD cerebral perfusion SPECT. The mCBF was calculated from the mean counts of this slice. A region of interest (ROI) has been manually set on the reference slice to obtain the mean counts (manual ROI method). However, there was large variability observed in the value of rCBF in this method. We developed a 3DSRT method for improving the accuracy of the mean counts in the reference slice and evaluated the difference between the value of rCBF on manual ROI method and that on 3DSRT method in consecutive 11 patients with cerebral vascular disease.

Difference in the value of mean counts of the reference slice was distributed within the 2 standard deviations (SD) with Blant-Altman analysis in 9 of 11 patients. Significant difference in the value of mean counts between two methods was observed in 2 of 11 patients. 3DSRT method is superior accuracy to the manual ROI method in the evaluation of the counts in the ROI. Lower accuracy in manual ROI method, therefore, results in the difference of the value of mean counts.

3DSRT method provides high accuracy with the various quantitative methods for the evaluation of rCBF using ^{99m}Tc -ECD.

Key words: ^{99m}Tc -ECD, Lassen correction, mCBF, rCBF, 3DSRT.