Region of Interest based Multi-parametric Quantitation of Perfusion Weighted MR Images

Pauliah Mohan[1,2], Vipin Saxena[2], R.K. Gupta[1]

[1]Department of Radiodiagnosis, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Luckow,
[2]Department of Computer Science, BBAU Central University, Lucknow

Abstract

The in-vivo tissue characterization and differentiation of regions of interest (ROI) is an essential constituent of Medical Imaging system. Magnetic Resonance (MR) perfusion imaging is a promising tool for in-vivo study of cerebral hemodynamic perturbations. Analyzing the tracer dynamics and its kinetic distribution offers insight into tissue microcirculatory changes that aid in reflecting the underlying pathophysiology. In our study, we aimed to evaluate region of interest based quantitative measurements of the voxel based derived perfusion indices on stroke and glioma patients and their clinical implications. The resultant information revealed that the hemodynamic variability's on the temporal profile of ischemia can be assessed. The in-house developed software tool employing the algorithm shows the delineation of tumor margin with visible microvascular hotspots and heterogeneity. Thus potentially unravels tumor behavior than is available from feature based extraction of ROI whereby improving diagnostic accuracy and plan of management.

Key words: Region of Interest, rCBV, rCBF, Perfusion Weighted Imaging, Voxel, Algorithm, Microvascular hotspots, Quantitation, Software.