ASMRM & ICMRI 2020
November 03 - 04, 2020 Virtual Congress http://2020.ksmrm.org
ASMRM Korean Society of Magnetic Resonance in Medicine

Advanced

SY09-3

Myelin water imaging

Alex MacKay

Radiology, University of British Columbia, Canada

It is well known that white matter tissue is spatially inhomogeneous at the level of any MR image voxel dimension. Thus, spatial inhomogeneity plays an important role in the behavior of MR signals from white matter. In particular, it is incorrect to assign a single T¬2 time to tissue in a white matter MR voxel.

100% of the MRI signal from white matter is from hydrogens in water molecules. However, the microscopic environment of water in white matter is not homogeneous; it can be separated into two reservoirs: water between myelin bilayers and water in the intra- and extra- cellular spaces. Water has different T1 and T2 times in these two environments. This difference has to be accounted for in any quantitative study of relaxation in brain. In myelin water imaging, the MR signal from water in myelin is separated from that in the intra and extracellular water spaces, thereby providing an in vivo measurement of myelin content.

This talk will introduce the technique of myelin water imaging covering measurement techniques, validation, limitations and applications. Speculation will be made about how myelin water imaging might one day fit in the clinic.

Keywords: T2 and T1 relaxation, myelin, myelin water imaging