

Evaluation of Longitudinal Relaxation Time (T1) of Bone Marrow in Lumbar Vertebrae of Leukaemia Patients Undergoing Magnetic Resonance Imaging

Authors : M. G. R. S. Perera, B. S. Weerakoon, L. P. G. Sherminie, M. L. Jayatilake, R. D. Jayasinghe, W. Huang

Abstract : The aim of this study was to measure and evaluate the Longitudinal Relaxation Times (T1) in bone marrow of an Acute Myeloid Leukaemia (AML) patient in order to explore the potential for a prognostic biomarker using Magnetic Resonance Imaging (MRI) which will be a non-invasive prognostic approach to AML. MR image data were collected in the DICOM format and MATLAB Simulink software was used in the image processing and data analysis. For quantitative MRI data analysis, Region of Interests (ROI) on multiple image slices were drawn encompassing vertebral bodies of L3, L4, and L5. T1 was evaluated using the T1 maps obtained. The estimated bone marrow mean value of T1 was 790.1 (ms) at 3T. However, the reported T1 value of healthy subjects is significantly (946.0 ms) higher than the present finding. This suggests that the T1 for bone marrow can be considered as a potential prognostic biomarker for AML patients.

Keywords : acute myeloid leukaemia, longitudinal relaxation time, magnetic resonance imaging, prognostic biomarker.

Conference Title : ICMPS 2014 : International Conference on Medical Physics and Medical Sciences

Conference Location : Singapore, Singapore

Conference Dates : September 11-12, 2014