World Academy of Science, Engineering and Technology
International Journal of Nuclear and Quantum Engineering
Vol:17, No:01, 2023

Based on MR Spectroscopy, Metabolite Ratio Analysis of MRI Images for Metastatic Lesion

Authors : Hossain A, Hossain S.

Abstract : Introduction: In a small cohort, we sought to assess the magnetic resonance spectroscopy's (MRS) ability to predict the presence of metastatic lesions. Method: A Popular Diagnostic Centre Limited enrolled patients with neuroepithelial tumors. The 1H CSI MRS of the brain allows us to detect changes in the concentration of specific metabolites caused by metastatic lesions. Among these metabolites are N-acetyl-aspartate (NNA), creatine (Cr), and choline (Cho). For Cho, NAA, Cr, and Cr_2, the metabolic ratio was calculated using the division method. Results: The NAA values were 0.63 and 5.65 for tumor cells, 1.86 and 5.66 for normal cells, and 1.86 and 5.66 for normal cells 2. NAA values for normal cells 1 were 1.84, 10.6, and 1.86 for normal cells 2, respectively. Cho levels were as low as 0.8 and 10.53 in the tumor cell, compared to 1.12 and 2.7 in the normal cell 1 and 1.24 and 6.36 in the normal cell 2. Cho/Cr_2 barely distinguished itself from the other ratios in terms of significance. For tumor cells, the ratios of Cho/NAA, Cho/Cr_2, NAA/Cho, and NAA/Cr_2 were significant. Normal cell 1 had significant Cho/NAA, Cho/Cr, NAA/Cho, and NAA/Cr ratios. Conclusion: The clinical result can be improved by using 1H-MRSI to guide the size of resection for metastatic lesions. Even though it is non-invasive and doesn't present any difficulties during the procedure, MRS has been shown to predict the detection of metastatic lesions.

Keywords : metabolite ratio, MRI images, metastatic lesion, MR spectroscopy, N-acetyl-aspartate
Conference Title : ICRPR 2023 : International Conference on Radiological Physics and Radiation
Conference Location : Bangkok, Thailand
Conference Dates : January 16-17, 2023