

Advanced Magnetic Resonance Imaging in Differentiation of Neurocysticercosis and Tuberculoma

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Abstract : Background: Tuberculoma and neurocysticercosis (NCC) are two most common intracranial infections in developing country. They often simulate on neuroimaging and in absence of typical imaging features cause significant diagnostic dilemmas. Differentiation is extremely important to avoid empirical exposure to antitubercular medications or nonspecific treatment causing disease progression. Purpose: Better characterization and differentiation of CNS tuberculoma and NCC by using morphological and multiple advanced functional MRI. Material and Methods: Total fifty untreated patients (20 tuberculoma and 30 NCC) were evaluated by using conventional and advanced sequences like CISS, SWI, DWI, DTI, Magnetization transfer (MT), T2Relaxometry (T2R), Perfusion and Spectroscopy. rCBV,ADC,FA,T2R,MTR values and metabolite ratios were calculated from lesion and normal parenchyma. Diagnosis was confirmed by typical biochemical, histopathological and imaging features. Results: CISS was most useful sequence for scolex detection (90% on CISS vs 73% on routine sequences). SWI showed higher scolex detection ability. Mean values of ADC, FA,T2R from core and rCBV from wall of lesion were significantly different in tuberculoma and NCC ($P < 0.05$). Mean values of rCBV, ADC, T2R and FA for tuberculoma and NCC were (3.36 vs 1.3), (1.09×10^{-3} vs 1.4×10^{-3}), (0.13×10^{-3} vs 0.09×10^{-3}) and (88.65 ms vs 272.3 ms) respectively. Tuberculomas showed high lipid peak, more choline and lower creatinine with Ch/Cr ratio > 1 . T2R value was most significant parameter for differentiation. Cut off values for each significant parameters have proposed. Conclusion: Quantitative MRI in combination with conventional sequences can better characterize and differentiate similar appearing tuberculoma and NCC and may be incorporated in routine protocol which may avoid brain biopsy and empirical therapy.

Keywords : advanced functional MRI, differentiation, neurocysticercosis, tuberculoma

Conference Title : ICNN 2017 : International Conference on Neuroengineering and Neuroimaging

Conference Location : Venice, Italy

Conference Dates : June 21-22, 2017