P303

Diffusion Tensor Imaging as a Solution to Problematic Brain White Matter Patches

Alaa Saleh[1], Sarmad Al Fahad[1], Heba Ali[2]

[1]Neurospinal Hospital, Dubai, United Arab Emirates
[2]Open Mr for Spine Surgery, Dubai, United Arab Emirates

Background: In daily practice, it is very common to encounter multiple brain white matter lesions and determining whether these lesions are due to a demyelinating etiology or other etiologies would be difficult. Depending on the fact that the demyelination is a diffuse brain process affecting all white as well as grey matter,dti was used to assess the normal appearing white matter (NAWM) and to verify whether it is affected favoring a demylinating process.
Methods: The study included 136 patients. All performed a brain MRI with DTI for the nawm. Fraction aniostropy (FA value) and apparent diffusion coefficient value (ADC) for symmetric points at the right and left hemispheres with nawm outside the evident brain patches were measured and comparison of the value of these two parameters in each pair of points was performed. The presence of discrepancy of the values between points of each pair was considered that the nawm shows affection and based on the prevalence of this discrepancy among the points which were at least 20 points (10 pairs) the diagnosis of demyelination was established. The gold standard for the diagnosis of demyelination was a lumbar puncture to calculate the IgG index and study the presence of oligoclonal bands in csfand in serum.
Results: Comparison of the results obtained from DTI and lumbar puncture revealed true positive results in 90% of the patients, false positive results in 2% of the patients, and false negative results in 7% of the patients. A list of diagnoses was also identified for the non demyelinating patches in which no obvious discrepancy between the points of the white matter pairs was found. It was established through performing a variety of tests including cervical and dorsal spine MRIs and angiography for the cerebral arteries.
Conclusions: This study highlights the importance of performing dti for the NAWM as a non invasive test in order to aid in diagnosing the etiology of brain white matter patches especially when the clinical and mr findings are not enough to establish a diagnosis.