Motor Recovery After Ischemic Stroke:

Clinical And Diffusion Tensor Imaging Study

A thesis submitted for partial fulfillment

of MD degree in Neurology

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Abstract

Background: Stroke is the most common cause of long-term disability in adults throughout the world. Diffusion tensor imaging (DTI) is an emerging neuroimaging technique that allows measuring the integrity of corticospinal tracts (CSTs). **Aim of the work:** To compare the clinical scores and diffusion tensor parameters among the patients and controls at baseline and after 6 months follow up; to detect the correlation between diffusion tensor findings and clinical scores at baseline and after 6 months follow up; to assess the predictive value of DTI for motor outcome in patients presenting with acute ischemic stroke. **Patients and methods:** Thirty four patients with acute ischemic stroke subjected to clinical assessment using National Institutes of Health Stroke Scale (NIHSS), Modified Rankin Scale (mRS), Medical Research Council (MRC) score, Morticity Index (MI) score and DTI to detect the degree of reduction of fractional anisotropy (FA), and pattern of CSTs at baseline and after 6 months follow up. Seventeen age, sex matched controls underwent DTI assessment **Results:** There was statistically significant decrease in NIHSS, and MRS scores; increase in MRC scores for different muscles, and MI scores among cases after 6 months follow up. There was a statistically significant reduction in the baseline FA values of the CSTs on the affected sides compared to the contralateral sides and controls. There was statistically significant lower mean of both baseline FA lesion side, and FA ratio among the patients when compared to follow up disrupted CSTs. The patients with high baseline FA, rFA showed good recovery response with 0.483, 0.948 values respectively as the cut off values. There was statistically significant negative correlation between baseline FA on lesion side, FA ratio with both follow up NIHSS, and MRS scores and statistically significant positive correlation between baseline FA on lesion side, FA ratio with follow up MI scores. **Conclusion:** Patients with higher FA, rFA values were correlated with better motor recovery , baseline FA and rFA could predict the motor recovery in ischemic stroke patients.

Key words: Stroke, Diffusion tensor imaging, Corticospinal tract, Motor reovery, Prognosis.