Abstract:

Abstract OBJECTIVE: The primary purpose of this study was to provide insight into the central changes that occur in amyotrophic lateral sclerosis (ALS) with a view to understanding how these could contribute to symptoms. MATERIAL AND METHODS: Seventeen patients with definite ALS and 17 control healthy volunteers were included in the study. Clinical examination, amyotrophic lateral sclerosis severity score (ALSSS) and TMS investigations including measurement of resting and active motor threshold (RMT and AMT), motor evoked potential (MEP), input-output curve, contralateral silent period, and transcallosal inhibition (CSP and TI, postulated markers of GABAb function) were measured for each participant. RESULTS: There were no significant differences in RMT or AMT in either hemisphere between patients and the control group. Despite this there was a significant negative correlation between ALSSS and RMT and AMT meaning that increased severity was associated with higher thresholds. MEPs were significantly smaller in ALS patients in comparison to the control group (P = 0.03). There was a significant decrease in the slope of the I/O relationship of MEP amplitude to TMS intensity in patients group in comparison to controls. ALS patients had a significant prolongation of CSP and TI for both hemispheres. There was a tendency for a significant negative correlation between left TI and ALSSS (P = 0.051). CONCLUSION: Measurements of cortical motor excitatory changes in ALS confirm the presence of corticospinal hypoexcitability. Additionally we found increased excitability of presumed intracortical GABAb circuits that correlated with the severity of ALS. We postulate that the disease results in an imbalance between excitation and inhibition in the cortex that can contribute to clinical symptoms.

Published In: