Intracortical lesions by 3T magnetic resonance imaging and correlation with cognitive impairment in multiple sclerosis.

BACKGROUND: Accurate classification of multiple sclerosis (MS) lesions in the brain cortex may be important in understanding their impact on cognitive impairment (CI). Improved accuracy in identification/classification of cortical lesions was demonstrated in a study combining two magnetic resonance imaging (MRI) sequences: double inversion recovery (DIR) and T1-weighted phase-sensitive inversion recovery (PSIR).

OBJECTIVE: To evaluate the role of intracortical lesions (IC) in MS-related CI and compare it with the role of mixed (MX), juxtacortical (JX), the sum of IC + MX and with total lesions as detected on DIR/PSIR images. Correlations between CI and brain atrophy, disease severity and disease duration were also sought.

METHODS: A total of 39 patients underwent extensive neuropsychological testing and were classified into normal and impaired groups. Images were obtained on a 3T scanner and cortical lesions were assessed blind to the cognitive status of the subjects.

RESULTS: Some 238 cortical lesions were identified (130 IC, 108 MX) in 82% of the patients; 39 JX lesions were also identified. Correlations between CI and MX lesions alone (p = 0.010) and with the sum of IC + MX lesions (p = 0.030) were found. A correlation between severity of CI and Expanded Disability Status Scale was also seen (p = 0.009).
CONCLUSION: Cortical lesions play an important role in CI. However, our results suggest that lesions that remain contained within the cortical ribbon do not play a more important role than ones extending into the adjacent white matter; furthermore, the size of the cortical lesion, and not the tissue-specific location, may better explain their correlation with CI.

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