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Clinical and MRI Features of Myelitis at Onset in AQP4-Antibody and MOG-Antibody Disease

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Introduction:
Both aquaporin-4 antibodies (AQP4-Ab) and myelin oligodendrocyte glycoprotein antibodies (MOG-Ab) can cause severe attacks of myelitis. Determining if the onset attack indicates prognosis would be useful.

Methods:
Adult AQP4-Ab and MOG-Ab-positive patients, attending our specialist service, with myelitis at onset were identified. MRI scans were reviewed and associated with clinical outcomes.

Results:
56 patients were included (33 AQP4-Ab; 23 MOG-Ab). Lesion location and length did not differ. Long lesions (>3 segments) were most common and short lesions occurred in 15.2% and 22.7%, respectively. Those with MOG-Ab were more likely to have >1 lesion present at onset (p=0.016), brain lesions (p=0.017) and conus lesions (p=0.035).

Median nadir EDSS associated with total lesion length and was 7.5(range:3-9.5) in AQP4-Ab and 6(range:1-9) in MOG-Ab. Those with AQP4-Ab were more likely to have EDSS $\geq$6 at last follow-up (p=0.003). Residual disability in AQP4-Ab associated with onset age, nadir EDSS and lesion length. In MOG-Ab, the presence of a concurrent brainstem lesion was significantly associated with EDSS $\geq$3 at last follow-up (p=0.025). The only patient to reach EDSS 6 in the MOG-Ab cohort was the oldest (70 years old). The need for long-term catheterisation is associated with conus lesions across groups (p=0.009; OR=9.1).

Those in the AQP4-Ab group were more likely to have recurrent myelitis attacks (p=0.001), with 30% going on to have $\geq$3 episodes despite being on long-term immunosuppression. MOG-Ab myelitis was more likely to relapse with optic neuritis.

The mean EDSS improvement in MOG-Ab was greater with complete MRI resolution (p=0.011).

Conclusion:
MOG-Ab associated myelitis shows a better recovery of mobility, which appears to be associated with their younger onset age. The increased prevalence of conus lesions accounts for those MOG-Ab patients that require long-term catheterisation. AQP4-Ab myelitis is more likely to be followed by myelitis and MOG-Ab disease by optic neuritis.

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