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Smoking adversely affects MRI disease activity in progressive multiple sclerosis

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Background: Smoking is an established risk factor for progression in multiple sclerosis (MS).

Objective: To investigate the relationship between smoking and MRI disease activity in progressive MS.

Methods: We studied MRI data at baseline and after 48 weeks in 44 progressive MS patients who participated in a clinical trial comparing treatment with erythropoietin (N=23) with placebo (N=21) for 24 weeks. Patients were categorized as current smokers, former smokers or non-smokers. The number of active T2 lesions, brain volume change and change in normal-appearing white matter (NAWM) and cortical gray matter (CGM) volumes were measured with 3T MRI. The relationship between smoking and active T2 lesions was assessed by negative binomial models, and the effect of smoking on atrophy measures was analyzed by t-tests. Diffusion tensor imaging (DTI) and magnetization transfer ratio (MTR) data are analyzed at the moment, and will be presented at the meeting.

Results: Smokers, former-smokers and non-smokers comprised 50%/50%, 67%/33% and 48%/52% in the EPO/placebo group. The rate ratio (RR) for active T2 lesions was 2.2 (p=0.006) for smokers and 1.5 (p=0.18) for former smokers compared with non-smokers. The effect of smoking remained significant after correction for covariates. Atrophy rates were not influenced by smoking.

Conclusion: In progressive MS, smoking is associated with a higher active T2 lesion rate consistent with a proinflammatory effect of smoking.