

# Changes of Free Radicals in Early Progression of Multiple Sclerosis

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**Background:** Several factors can compromise the endogenous protective system of organism and accelerate the induction of free radicals that may influence the course of MS.

**Study purposed** to investigate the role of several possible risk factors in secondary progression of MS.

**Methods:** We investigated smoking, dietary patterns, alcohol intake, severe and chronic stress in 60 secondary progressive MS (SPMS) patients, 33 (first group) from refugees, 27 from general population (second group). Age at disease onset, disease duration, number of relapses, length of period until the secondary progression of disease and the Kurtzke Expanded Disability Status Scale (EDSS) scores were collected. Control comprised 15 healthy volunteers. Brain was visualized by Magnetic Resonance Tomography (MRT-1.5-Tesla). Mood examined by Beck Depression Inventory (BDI-II). Blood free radicals detected by Electron Paramagnetic Resonance Method (EPR). Statistics was performed by SPSS-11.0.

**Results:** First group developed SPMS in a shorter period compared to second group ( $7.2 \pm 2.1$  versus  $16.4 \pm 3.8$ ,  $p < 0.05$ ). Multiple logistic regression found the significance of smoking and depression for development of SPMS ( $p < 0.05$ ). Depression was found in 85% of first - and in 23% of second group (BDI > 9/10). Lypoperoxyradical ( $LOO^{\cdot}$ ) and superoxide anion ( $O_2^{\cdot-}$ ) were increased in first group as compared to second group and control. Positive correlation was established between BDI index and  $LOO^{\cdot}$ - and  $O_2^{\cdot-}$  data ( $r = +0.33$  and  $r = +0.19$ ,  $p < 0.05$ ).

**Conclusion:** Smoking and depression due to chronic social stress may contribute to the promotion of free radical pathology in MS and thus, can stimulate the neurodegeneration.