Prevalence of Minor Beta Thalassemia (MBT) in Patients with Multiple Sclerosis (MS) in Southern Iran

Masood Nomovi¹, Maryam Sharifian Dorche¹, Alireza Nikseresht¹

¹Clinical Neurology Research Center, Department of Neurology, Shiraz University of Medical Sciences, Shiraz, Iran

Background: Multiple sclerosis (MS) is a chronic demyelinating disease of the central nervous system (CNS). Minor beta-thalassemia (MBT) is a common genetic disorder in the Mediterranean countries with a reported genetic distribution frequency as high as 5-10% of the normal population in some countries such as Iran. MBT proposed to increase the risk of developing autoimmune disease.

Objective(s): Our aim in this study was to examine the prevalence of MBT among MS patients in a referral center in Fars Province, southern Iran.

Method(s): MBT frequency was investigated in MS patients who were referred to our center as a referral center in Fars Province. The patients, who had Mean Corpuscular Volume (MCV) lower than 80 fL, Mean Corpuscular Hemoglobin level (MCH) less than 27 pg/L according to complete blood count (CBC) considered as MBT. Patients with history of other hematological disorders, patients with Pure Iron deficiency anemia and patients who received medications with effects on RBCs were excluded. The frequency of patients with MBT in MS patient group was compared with the prevalence of MBT in normal population of Fars Province (with the same Method(s) of screening as the Method(s) of our study).

Result(s): 863 MS patients were included (698 Females and 165 Males). According to inclusion criteria; 147(17%) patients had MBT (126 Females and 21 Males). Prevalence of MBT was significantly higher among MS patients than normal population of Fars Province. Prevalence of MBT among Female and Male patients was 18% and 12% which was significantly different.

Conclusion: MBT is associated with an increase in serum level of homocysteine. Elevated serum homocysteine levels exert its neurotoxic properties through different mechanisms. Moreover patients with MS have global cerebral hypo-perfusion which may be due to the reduced axonal activity. In the healthy individuals with MBT the mean hemoglobin level is on average 15% lower than normal persons of the same sex and age without beta-thalassemia. Accordingly, it could be hypothesized that MBT due to related Elevated serum homocysteine, anemia and hypoxemia may be related with MS plaque formation.