Wednesday, July 11, 2019

11:30–13:10

Room Atlantic 2

Symposium 08

Temporal lobe epilepsy: from cells to molecules

Organizers: Ivan Spasojevic (Belgrade, RS) and Aleksandar Ristic (Belgrade, RS)

THE IMPORTANCE OF COPPER IN PATHOLOGY OF MESIAL TEMPORAL LOBE EPILEPSY

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More and more studies are identifying the regulation of metal homeostasis as one of the key points of central nervous system's well-being. Epilepsy is a particularly interesting neurological condition when viewed in terms of the correlation between the amount of metals and the development of a seizure. This lecture will present contribution of our group to the field of metal biology in epilepsy by mapping brain metals in sclerotic hippocampus resected from drug resistant mesial temporal lobe epilepsy (mTLE) patients as surgical therapeutic approach. Direct insight into this epileptogenic area, by two powerful techniques, optical emission and mass spectrometry, has led us to investigation of copper turnover. Namely, among the examined metals, we found the deficiency of copper in sclerotic hippocampus on two levels: (i) in whole structure (ii) and locally in the areas of neuronal loss, with significant correlation between copper concentration and neuron density. Furthermore, analysis of copper metalloproteins showed: (i) significant increase or decrease in levels of protein that is participating in copper transport into the cell (CTR1) depending on the degree of hippocampal neuronal loss; (ii) and lower activity of an enzyme in which copper is part of the active site, cytochrome c oxidase, in sclerotic hippocampi of patients compared to control tissue. In our further investigations it remained to be determined whether changes in copper concentrations and copper metalloproteins are causal to pathology of mTLE or they represent epiphenomenon.

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