

ABSTRACT

Neurorehabilitation is a multidisciplinary rehabilitation process used in patients with neurological diseases. These patients have not only movement disorders but also cognitive and neurobehavioral problems as well as aphasias. Their rehabilitation is a long term process and the results are often unsatisfactory. Neuroplasticity - physiological basis for neurorehabilitation induces functional restitution or recovery after secondary brain damage. Various neuroprotective substances (e.g. erythropoietin - EPO) are tested to empower mechanisms of plasticity after brain injury. Preclinical studies testing efficacy of those substances in animal brain damage models are essential to prepare clinical trials.

The aim of the study was to reveal the influence of EPO combined with rehabilitation on functional outcomes after global cerebral hypoxia. FIM (Functional independence measure) test was used for functional evaluation and Meilli test for visual memory of the patients who attended special program for rehabilitation in clinical part. Patients who came earlier had better prognosis than patients who came later.

In experimental part three-months old male Wistar albino rats were exposed to hypobaric hypoxia for 60 minutes in an experimental chamber, simulating an altitude of 8000 m. Half of the animals received one intraperitoneal injection immediately after the performance hypoxia/sham hypoxia. The spatial memory was tested by using Morris water maze. Rats housed in EE treated with EPO performed significantly better than rats living in standard housing.

Multidisciplinary neurorehabilitation could be supported by pharmacologic neuroprotective approaches. EPO seems to play an important role in this process.

Key words: neurorehabilitation, enriched environment, erythropoietin, global cerebral hypoxia, hypobaric hypoxia