

Using mathematical package for modeling of sleep disorders in patients with traumatic brain injury

Alla Stolyarevska

The Eastern-Ukrainian Branch of the International Solomon University, Kharkov, Ukraine

Yuriy Kuznyetsov

Research Production Enterprise Hartron-Arkos, Kharkov, Ukraine

Natalia Shunina

Central Clinical Hospital of Ukraine Rail

Kharkov, Ukraine

Abstract

Mathematical packages are widely used for data processing and analysis, including processing of biomedical information. In this paper we consider the use of known mathematical packages for processing of biomedical data on patients who received a traumatic brain injury in order to determine the effect of injury severity on sleep. The importance of the problem is related primarily to the fact that persons, who have had a traumatic brain injury, also have and sleep disturbances. As a consequence, the quality of life and ability to work are declined.

Traumatic brain injuries include both medical and psychiatric symptoms, and frequent complaints of sleep disturbance. Special studies are required to determine the nature and extent of this disturbance. The researchers need to focus on the disclosure of specific types, causes and severity of traumatic brain injury, which often lead to problems of sleep disorders. The researcher builds its own “model of sleep disorders”.

The models allow uncovering the hidden relationships between measures of sleep disorders and their significance due to the severity of injury.

Algorithm, built on the basis of models, makes it possible a certain degree of confidence to identify the severity of traumatic brain injury patients, thereby determine the clinical determinants of quality of life in patients who have suffered traumatic brain injury with sleep disorders.

We used mainly R-package and Excel. R-package is an open source free software. It includes a lot of libraries which are created by users in different countries. I will compare the results obtained with using Statistica and Maple.

Keywords:

Mathematical packages, data analysis, traumatic brain injury, sleep disorders, quality of life.