

Informational Technologies for Data Processing Regarding Epilepsy

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Abstract: In the paper the objectives and present status of an informational technology development for remission study of epileptic patients with psychological disorders, new knowledge discoveries regarding epilepsy and setting a new original method effective for treatment of this disease are related.

Keywords: epilepsy, informational technology.

1 Introduction

The task of treatment of epileptic patients with psychological disorders became drastically a global problem. Many neurologist and psychiatrist doctors are more and more preoccupied with this problem and the obtained results became more important and precious. Recent statistical data show an increase of up to 10.2 persons per 1000, while in developed countries from West Europe, US and Canada are related data of 2.4-7.2 persons per 1000. People with epilepsy need not only appropriate treatment, but the social-psychological support and they require mandatory society understanding and moral support. Every day, scientists and practitioners in the area of epileptology, make great efforts for finding outstanding remedies involving experts from other areas with scope to solve an important task as treatment of epilepsy with psychological disorders.

The number of patients in Republic of Moldova with revealed epilepsy increases from year to year, even in conditions of massive migration, fact proved by increased number of complains from population and in particular from young persons to neurologists and psychiatrists.

The epilepsy is a multidisciplinary problem. The success in epilepsy treatment requires collaboration of high qualification experts from different areas as: neurologists, psychiatrists, geneticists, pediatricians, mathematicians, immunologists, neurophysiologists, neuropharmacologists, artificial intelligence specialists.

Impressive discoveries from last years in the areas of genetics, immunology, neurophysiology, practical research and artificial intelligence encourage that in the near future the medicine will overcome the dogma of incurability of epilepsy.

2 The project development stages

Based on a complex analysis on research material, methods of treatment for resistant types of epilepsy, development and implementation of intelligent support system for diagnosis and treatment of epilepsy will be attempt to develop for the first time in our republic an intelligent support system for treatment and diagnosis of epilepsy.

We propose a new project composed of *six stages*, which unifies the expertise in the area of medical science, physiology, decision support systems and artificial intelligence. Our research combines the development of: an expert system for diagnosis of epilepsy patients, a support system for doctor assistance during program process development for epilepsy patients treatment, selection and data results classification regarding patients with epilepsy remission, database development based on medical histories of epilepsy patients with remission, analysis of these data from database and retrieval of knowledge regarding the effect of remission of these data, expert system development to forecast the new patient with remission group with symptoms of epilepsy, developing a distance learning system of epilepsy and prophylaxis of this disease.

The first stage of the project is to develop *an expert system* for diagnosis of epilepsy patients. The system is planned to assist doctors from Moldova clinics and abroad. The system will provide a higher level of medical diagnosis from provinces and respectively, a smaller quantity of errors in diagnosis. The expert system is projected to be used in the training process in Medical Universities. It also could be used to support remote diagnosis process of patients with symptoms of epilepsy and to be used for population information on epilepsy and prophylaxis of this disease.

The second stage of the project is planned for development of a support system for doctor's assistance within the process of development of patient epilepsy treatment. The system will be developed following specialty classifiers.

The third stage of the project consists in data selection and systematization based on patients with remission of epilepsy, database development regarding medical histories of epilepsy patients with remission. In present there are found over 100 former epilepsy patients and brought with contribution of a new treatment (non-conventional) methodology into remission of the disease. Data regarding medical reports of these groups of patients will be prepared according to requirements of Data Mining technology for preparing data base of patients' peculiarities (age, social group, diagnosis, etc.).

The fourth stage of the project will consist of database knowledge retrieval. Knowledge will be collated into groups of patients according to diagnosis and degree of remission. Our experience of treating patients with epilepsy and bringing on remission status allows us to distinguish the following classes of patients with remission:

1. *patients with therapeutic remission* – patient is maintained in this condition on a background of daily therapeutic treatment;
2. *patients with therapeutic remission with stable compensation* – no drug is prescribed to patient;
3. *patients with spontaneous remission* – after a short period of anti-epileptic drugs prescription (3-6 months);
4. *post anti-epileptic drugs prescription* (6-12 months);
5. *patients judged by differential diagnosis with other diseases* (early metabolic disorders, deficiency of Mg ions, Ca etc.);
6. *cured patients, with diverse long term remission and intermission;*
7. *patients, who eventually are diagnosed and then cured.*

The fifth stage of the project – development of an expert system for prognosis of a new patient with epilepsy symptoms within remission group.

The sixth stage of the project – development of a distance learning system on epilepsy and an information system of population regarding epilepsy and prophylaxis of this illness. As result of performed investigations we intend to promote and implement a series of original and differentiated programs of family and social rehabilitation, epilepsies prophylaxis through information and education, provisions and suggestions for epilepsy prophylaxis and treatment.

At the moment are developed:

- an expert system for diagnosis of epilepsy patients [1, 2] according to Classification [4];
- an electronic textbook in epilepsy [1];
- a support system for development of epilepsy treatment programs [3].

3 Conclusion

It was narrated a new informational technology project for remission study of epileptic patients with psychiatric disorders and proposal of new innovational methods for treatment of this disease.

It was reported the actual status of development of this project.

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