

NEUROLOGY

Sofilkanych N. V.

COGNITIVE AND AFFECTIVE IMPAIRMENTS IN PATIENTS WITH TEMPORAL LOBE EPILEPSY

Uzhgorod National University, Ukraine

Abstract: This article deals with the results of cognitive and affective impairments treatment in 133 patients with temporal lobe epilepsy. These patients underwent cognitive-behavioral therapy, a combination of cognitive-behavioral therapy and pharmacotherapy, pharmacotherapy and surgical treatment. The most effective treatment methods and correction of cognitive and affective impairments in patients with temporal lobe epilepsy are antidepressant therapy and cognitive-behavioral therapy. None of these treatment methods resulted in increased attacks frequency which proves their safety. Antidepressants and cognitive-behavioral therapy result in affective impairments regression and cognitive impairments improvement.

KeyWords: temporal lobe epilepsy, cognitive impairments, affective impairments, neuropsychological testing.



INTRODUCTION

The spread of epilepsy among adult population makes up 0.05 - 0.1 per cent [9], in children epilepsy is observed in 0.05 - 0.1 per cent of cases [6]. According to other data there are about 50 million such patients in the world [10, 11].

In 2014 the International Antiepileptic League (IAEL) proposed a new clinical definition of this disease.

“Epilepsy is a cerebral disease which is determined by any of these states:

1. At least 2 unprovoked (or reflectory) attacks which occur at over 24 hours interval.
2. One unprovoked (or reflectory) attack and probability of further attacks similar to general relapse risk (at least 60 per cent) after 2 unprovoked attacks during further 10 years.
3. Epilepsy syndrome diagnosis.” [7]

The risk of relapse attack after the first one amounts to 37 per cent after the second one it increases to 73 per cent [7].

Epileptic attacks are well curable in most patients but, besides convulsions, the quality of their life is affected by cognitive, psychiatric and psychosocial aspects of this disease [7, 8].

2 PURPOSES, SUBJECTS and METHODS

2.1 Purpose

To assess effective diagnostic methods and to choose optimal treatment for cognitive and affective impairments in patients with temporal lobe epilepsy [5, 9].

2.2 Subjects & Methods

The study involved examination and treatment of 133 patients with temporal lobe epilepsy in 2012-2015. They were under observation of specialists of Neurology, Neurosurgery and Psychiatry Chair of Uzhgorod National University. The criteria for including patients into the investigation were: “temporal lobe epilepsy” diagnosis, age from 16 to 65, not less than 2 epileptic attacks a month, cognitive and affective impairments.

All tests and observations were held in Regional Clinical Centre of Neurosurgery and Neurology in Uzhgorod. Neuropsychological testing was held according to

Corresponding Author:

Nina Sofilkanych, MD, psychiatrist at Regional centre of Neurosurgery and Neurology, Uzhgorod National University, Ukraine. E-mail: ninzoloto@meta.ua

generally accepted methods: short scale assessment of cognitive functions (MMSE) - for defining patients' basic cognitive resource, test on 10 words retelling - for testing verbal memory index, Shulte tables to define attention, Hamilton Depression Rating Scale (HDRS) and Hamilton Anxiety Rating Scale (HARS) to assess depression and anxiety.

Our investigation structure is presented in Figure 1.

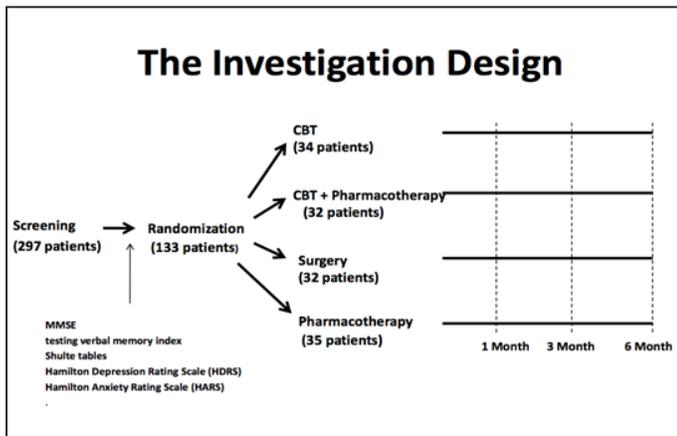


Fig.1 The investigation design

All patients were randomized according to the treatment methods into 4 groups. Patients included in group I underwent cognitive and affective impairments correction by means of cognitive-behavioral therapy (CBT), group II patients were administered antidepressants (preparation of SSRIs group and preparations affecting melatonin receptors). Group III patients received antidepressants in combination with CBT sessions, Group IV patients with refractory epilepsy underwent surgical treatment aimed at elimination of epileptogenic focus.

Testing was held at different periods: at screening stage, after the first month of treatment, after the third month and in 6 months.

All the above mentioned indices among the groups were compared by one-way disperse analysis (One-way ANOVA) with further post-shock analysis, Fisher function being used (Stat Soft

statistic 12). The index changes analysis was held within the group during different periods of time by means of disperse analysis according to Fridman.

Conflict of interests

There is no conflict of interests.

3 RESULTS AND DISCUSSION

We performed dynamics analysis of such important functions of higher nervous system, as memory and attention. The level of depression and anxiety in all 4 groups of patients was studied, too.

The dynamics of basic cognitive functions indices during the whole treatment period is shown on Figure 2.

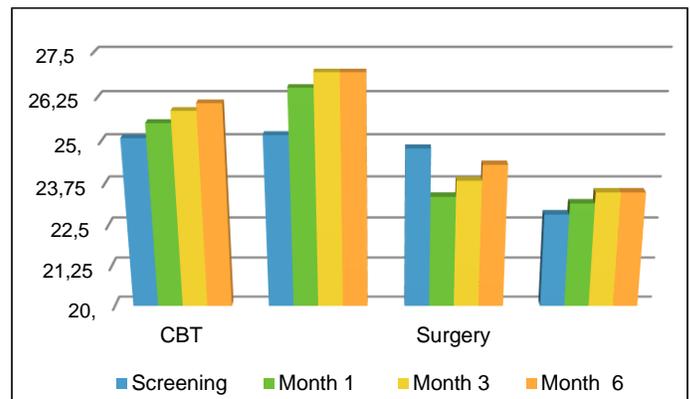


Fig.2 MMSE index dynamics in all 4 groups of patients

While analyzing the indices one should point out that in the patients' group who were on a cognitive-behavioral therapy the patients' condition improved, and the index increased from average 25.08 up to 26.08 during 6 months of treatment. This improvement was observed gradually during the whole treatment period. In the group where combined treatment with pharmacotherapy (antidepressants) and cognitive-behavioral therapy was carried out the index MMSE dynamics was less significant because the first cognitive deficit was negligible. The improvement was observed during the first three months, during the following months the MMSE index remained stable.

In the group of patients who were treated surgically the screening scale in-dex decreased from 24.7 to 24.3 during the operational period and up to six months after the treatment. The minimal index value was observed a month after operation which gradually up to the end of the six-month period reached its ini-tial screening level. In the group which was treated only with pharmacotherapy the given index increased from 22.8 to 23.5 during 6 months of treatment. The improvement was gradual like in the first group. Thus, we can come to the con-clusion that cognitive-behavioral therapy is the most effective for improving the general cognitive status of these patients. In case this kind of therapy cannot be done antidepressants treatment is also effective.

The dynamics of verbal memory index during the whole course of treat-ment is shown in Figure 3.

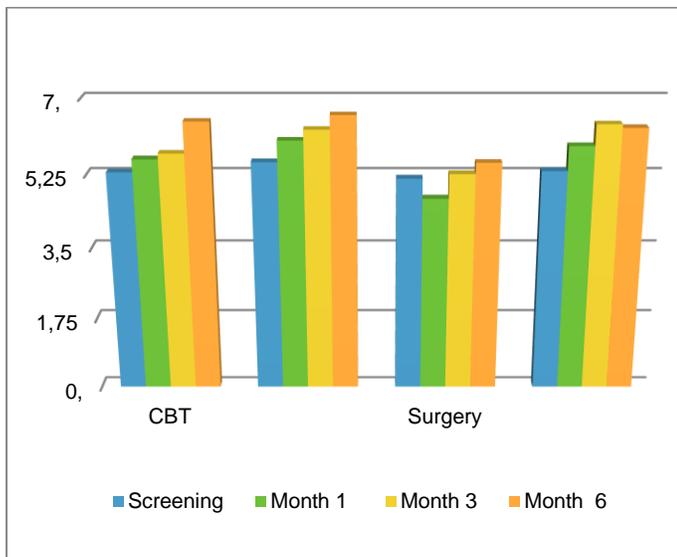


Fig.3 The dynamics of verbal memory index in all four patients' groups

The patients' group who underwent cognitive-behavioral therapy (CBT) increased their average verbal memory index from 5.3 to 6.4, which is the best result in all four groups. The verbal memory index improved gradually and turned out to be the fastest during the period between the third and the sixth months of CBT. The use of KBT and pharmacotherapy also appeared to be ef-

fective. During the whole treatment period - the verbal memory index increased from 5.5 to 6.6. In the group of patients who underwent surgical treatment the verbal memory index decreased from 5.1 to 4.6. Gradually this index was re-stored during 6 months and during the last control testing it proved to be better than during screening and was equal to 5.5. In the group of patients who were treated exceptionally with medicines the verbal memory index increased from 5.3 to 6.3. Thus, we can come to the conclusion that at the end of the treatment the best results were in the patients who were treated with cognitive-behavioral therapy.

The attention index during the six-month treatment is shown in Figure 4.

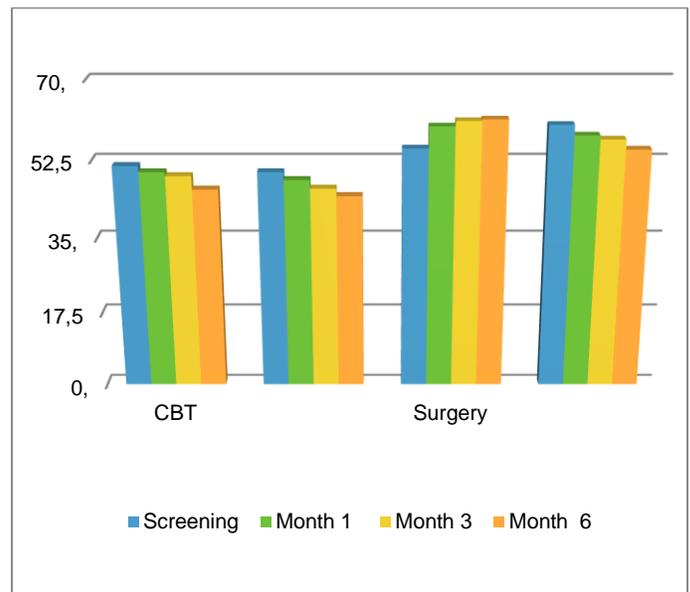


Fig.4 The dynamics of attention index in all four groups

According to these data we can conclude that the group of patients who underwent CBT gave positive treatment results and their attention index im-proved from 51.2c to 46.0c.

For the group of patients with combined form of treatment the results were similar and the attention index improved from 49.9c up to 44.5c. This index was the most vulnerable in the group of patients treated surgically. The average time necessary for testing increased from 55.1c to 61.4c. So, the attention was more vulnerable in the

patients who underwent surgical treatment which will need re-habilitation. The best results in attention correction occurred in the patients' group who underwent pharmacotherapy. This index increased in this group during 6 months of treatment from 60.2c to 54.9c. This kind of therapy can be recommended as the main attention correction therapy in the patients with temporal lobe epilepsy.

Besides cognitive status the analysis of affective component of these patients' groups was performed. In Figures 5 and 6 the effects of anxiety and depression treatment of patients with temporal lobe epilepsy are shown.

of convulsions after the operation. This index showed a regression up to the end of the six-month period. The anxiety index decreased from 19 to 11.42 during the six-month treatment. The anxiety index regression in the group of patients who underwent CBT appeared to be the worst ones which can be accounted for the emotions resistant to psychotherapy related with unpredictable epileptic attacks. The anxiety index decreased from 20.4 to 13.1 during 6 months. Thus, one should recommend a combination of CBT and pharmacotherapy to correct anxiety. The dynamics of depression index in all four groups of patients is shown in Figure 6.

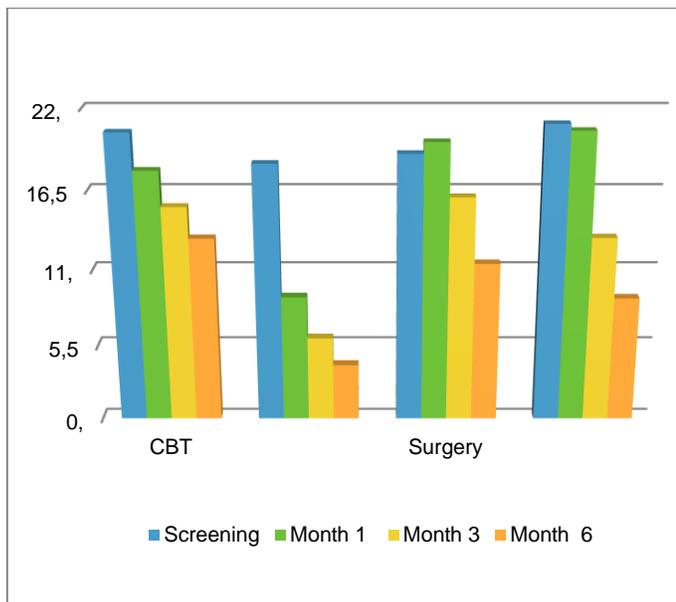


Fig.5 The dynamics of anxiety index in 4 groups of patients

While studying the anxiety dynamics the best results were found in the patients' group who underwent combined treatment. In this case the anxiety index decreased from 20.4 up to 13.1 during 6 months of treatment. Then followed the next effective group who underwent pharmacotherapy. In the group of patients who underwent surgery a definite increase of anxiety index was from 19 to 19.7 a month after surgery which is probably connected with the patients' excitement about restoration

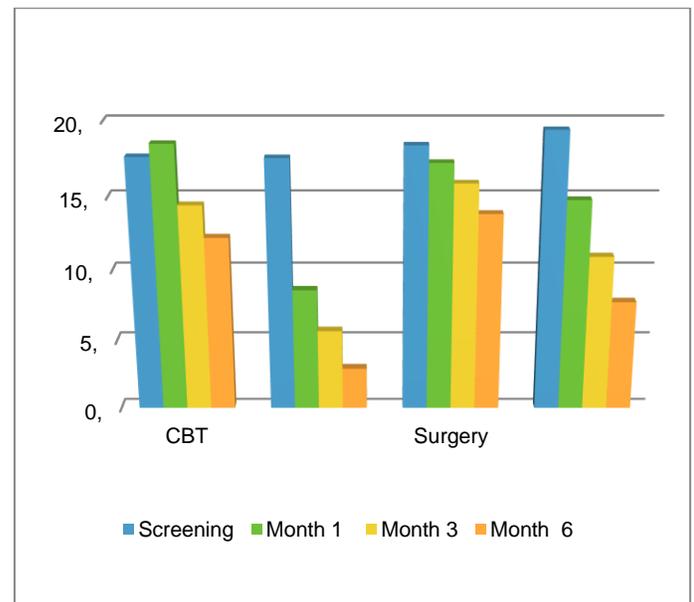


Fig.6 The dynamics of depression index in 4 groups of patients

According to depression index dynamics we can come to the conclusion that the most effective method of treatment was a combination of CBT and pharmacotherapy. The depression index during 6 months of treatment decreased from 17.5 up to 2.9. The following effective group was the one who underwent pharmacotherapy and their index during 6 treatment months decreased from 19.3 up to 7.7. In the group of patients who underwent only KBT the depression index decreased from 17.6 to

12.2. In the group of patients treated surgically the depression index during 6 treatment months gradually decreased from 18.2 up to 13.8. Thus, a combination of CBT and pharmacotherapy is the most effective in the treatment of depression.

4 CONCLUSIONS

The diagnostics of cognitive and affective impairments in patients with epi-lepsy is based on neuropsychological testing. Tests help to define the damaged domains during screening investigation and, assessing the dynamics, enable us to evaluate different treatment methods effectiveness.

The most effective methods of treatment and correction of cognitive and affective impairments in patients with temporal lobe epilepsy are antidepressant and cognitive-behavioral therapy. None of these kinds of treatment produced more frequent convulsions which proves their safety. Antidepressants therapy and cognitive-behavioral therapy result in affective impairments regression and cognitive impairments improvements. The patients who underwent surgery showed depression and anxiety indices regression in the postoperational period.

The only cognitive functions domain without significant positive dynamics in any group was memory. Cognitive rehabilitation is recommended for its improvement.

REFERENCES

1. Elger CE, Helmstaedter C, Kurthen M. (2004). Chronic epilepsy and cognition. *Lancet Neurol.* 3(11): 663-72.
2. Elger CE, Grunwald T, Lehnertz K, Kutas M, Helmstaedter C, Brockhaus A, Van Roost D, Heinze HJ. (1997). Human temporal lobe potentials in verbal learning and memory processes. *Neuropsychologia.* 35(5): 657-67.
3. Gleissner U, Helmstaedter C, Elger CE. (1998). Right hippocampal contribution to visual memory: a presurgical and postsurgical study in patients with temporal lobe epilepsy. *J Neurol Neurosurg Psychiatry.* 65(5): 665-9.

4. Helmstaedter C. (2002). Effects of chronic epilepsy on declarative memory systems. *Prog Brain Res.* 135: 439-53

5. Helmstaedter C, Pohl C, Elger CE. (1995). Relations between verbal and nonverbal memory performance: evidence of confounding effects particularly in patients with right temporal lobe epilepsy. *Cortex.* 31(2): 345-55.

6. Hommet C, Sauerwein HC, De Toffol B, Lassonde M. (2005). Idiopathic epileptic syndromes and cognition. *Neurosci Biobehav Rev.*

7. Penfield W, Jasper H. (1954). *Epilepsy and the functional anatomy of the brain.* Boston Little Brown & Co.

8. Scoville WB, Milner B. (2000). Loss of recent memory after bilateral hippocampal lesions. 1957. *J Neuropsychiatry Clin Neurosci.* 12 (1): 103-13.

9. Trenerry, M.R. (1996). Neuropsychologic assessment in surgical treatment of epilepsy. *Mayo-Clin-Proc.* 71/12: 1196-20.

10. Wieser HG. Selective amygdalohippocampectomy: indications, investigative technique and results. In Symon L. et al. (eds.) (1986). *Advances and technical standards in neurosurgery, Vol 13.* Vienna: Springer - Verlag; 39-133.

11. Engel J. (2004). Jr The goal of epilepsy therapy: no seizure, no side effects, as soon as possible. *CNS Spectr.* (2) 95 - 7).

Received: 11-Oct. - 2016

Accepted: 18-Dec. - 2016