The role of clinical and psychological research in epilepsy

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Abstract. This paper addresses the issue of interaction between psychological and clinical factors, their role and importance in integrated clinico-psychological study aimed at improving the life quality among patients with epilepsy. The paper’s objective is to look into the clinical and psychological components in the approach to epilepsy. The study surveyed 317 patients aged between 18 to 65 years old, with focal epilepsy. Verification of patients’ diagnosis was based on the findings of clinico-neurological, psychopathological, pathopsychological, electroencephalographic examinations and brain computer-assisted tomography (CAT). The authors also employed the psychodiagnostic technique "Personal profile of the crisis." The comprehensive clinico-psychological survey of patients with epilepsy allowed the authors to substantiate the selection of 3 groups of mental changes. Clinico-psychopathologically, in group I (38% of patients), cerebrasthenic disorders combined with psychopathic and cognitive impairments are dominant. Clinico-psychopathologically, in group II (35% of patients) the mental changes are dominated by cerebrasthenic disorders, a slight decrease in mnestic-intellectual functions, changes in behavior and activities. Clinico-psychopathologically, in group III the mental changes (27% of patients) corresponded mainly to secondary impairments of the neurotic level. The studied parameters reflected the adaptedness of the patient's personality, which manifests itself as reconstruction of personality’s functional structures and systems affected by the disease.

Keywords: personal profile · clinical aspects · psychological aspects · epilepsy

1. Introduction

The psychological component in clinical medicine is becoming a specific part of the therapeutic and diagnostic process. With its help, the role of mental factors in the etiology, pathogenesis, treatment of diseases, relapse prevention is substantiated. The findings revealed during clinical psychodiagnostics can be used by a doctor in making nosological and syndromic diagnoses, monitoring the dynamics of the patient’s condition during treatment, in various types of medical evaluations, in identifying the tasks and methods of psychotherapy.

Epilepsy is a common neuropsychic disease known throughout the world, an interdisciplinary phenomenon, including clinical, psychological, social, legal, economic and a number of other aspects. Subtle personality transformations in epilepsy are often the only early attribute of its distinctive diagnosis and are forerunners of the occurrence of typical changes in the cognitive area.

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The distinctive feature of this disease lies in a combination, in the clinical picture, of psychotic and non-psychotic types of disorders [1,2,3]. Therefore, patients with epilepsy are patients of neurologists, psychiatrists. In addition, the epilepsy is impacted by genetic, perinatal, environmental, and personality factors. In epilepsy clinical and psychological interactions are important as well [4,5,6]. An increased level of self-stigmatization is associated with low socioeconomic status [7], difficulties with employment, low level of medical literacy, failure to follow the prescribed treatment, concealment of the diagnosis, number of seizures [8]. The existence of intrapersonal conflicts, aggression, dysphoric disorder, depressive disorder in patients with epilepsy [9,10,11], causes the occurrence of frequent and regular conflict situations in the family and in the professional sphere of these patients, which naturally worsens their social adaptation in modern society, and requires professional intervention in the form of rehabilitation and psychocorrectional measures [12,13,14].

The psychological component, associated with the tasks of diagnosing epilepsy, follows its classical orientation to study patients' cognitive activity with an emphasis on important emotional and motivational characteristics. The aim of this paper was to study the clinical and psychological components in the approach to epilepsy.

2. Materials and Method

The survey engaged 317 people with focal epilepsy aged between 18 and 65 years old. The verification of the diagnosis was carried out taking into account the results of clinical and neurological, psychopathological, pathopsychological, electroencephalographic examination the brain. The study used the psychodiagnostic technique «Personal profile of the crisis» [15].

Statistical Methods. To divide patients according to neurobiological, clinical, psychopathological, pathopsychological and social characteristics into homogeneous groups, based on the values of some measure of similarity between objects, the cluster analysis was made using the k–means method. Other hierarchical methods employed in the research were the "nearest neighbor" method, the "furthest neighbor" method, pair-group method using arithmetic averages, and the centroid method. The final clusterisation was completed with the help of the k-means method, which implied breaking the totality of objects into a previously known number of clusters in order to minimize the sum of intraclass variances. The following values were used to describe the results: median (Me), the value of the lower and upper quartile (Q1 and Q3), 95% confidence intervals for medians (CI Me), medias difference (dMe) and 95% confidence intervals for medians difference (CI dMe). The differences were considered significant at $p < 0,05$. The practical implementation of the above methods was supplemented with applied statistical software package Statistica 10.0.

Ethical aspect. The research surveyed patients who gave consent and signed informed consent statement.

3. Results

The clinico-psychological analysis of patients with epilepsy revealed certain diagnostically important transformations of thinking, perceptual performance, and affective-personal qualities

The clinico - psychological study addressed the components of the internal picture of the disease, in particular, such areas as specifics of cognitive-analytical activity, specifics of emotional response, depressive disorders, changes in behavior and activity, as well as characteristic of functional problems. When examining cognitive-analytical activity, specificity of patients' attention, perception, memory and thinking were considered. The range of emotional response disorders was rather large and included such manifestations as anxiety, generalized emotional reactions in the form of anger, shame, guilt, blunted affect, faintheartedness, increased affection. The group of functional problems included disorders in vegetative system functions, cardiac activity, respiration, gastrointestinal tract, and sleep disorders. Application of the "Personal Profile of the Crisis" methodology within comprehensive clinical and psychological study made it possible to substantiate identification of 3 groups of patients' mental changes. The results are shown in Table 1.

Table 1. Characteristics of patient groups derived from K-means cluster analysis

Scale	Me			Q1; Q2			95% CI Me			p
	1	2	3	1	2	3	1	2	3	
Functional problems	6	8	7	5; 12	6; 18	6; 12	5; 7	7; 9	6; 8	0.001
Impairments of cognitive-analytical activities	12	10	5	8; 24	8; 12	4; 8	10;14	9; 11	4; 6	0.014
Emotional response disorders	5	4	6	4; 8	2; 9	1; 10	4; 6	3; 5	5; 7	0.004
Changes in behavior and activities	4	7	4	3; 9	6; 9	3; 6	3; 5	6; 8	3; 5	0.032

Note: 1, 2, 3 – groups; p − levels of significance of differences between the obtained centers for each of the variables; 95% CI – 95% confidence interval

Clinico-psychopathologically, in group I (n=120, 37,9%), cerebrasthenic disorders dominate and are characterised by alternation of emotional calmness and intemperance, fatigue, impaired concentration, sleep disorder with frequent night awakenings.

Cerebrasthenic disorders combine with psychopathic manifestations in the form of dysphoria with predominance of fatigue, tiredness, hostility to everything around, feelings of discontent, deep anxiety, a drop in energy and activity, curbing of interests, uniformity of behavior, importunity with manifestations of apathy to the happening moments, meaninglessness, uselessness, loss of health, negative visions, prospects and attitudes to life and people nearby. The above disorders are accompanied with cognitive impairments: decrease in mnestic-intellectual functions (Me=12, Q1=8, Q3=24, p=0.014), functional problems (Me=6, Q1=5,Q3=12, p=0.001), changes in behavior and activity(Me=4,Q1=3,Q3=9, p=0.032).

Clinico-psychopathologically, in group II (n=111, 35,0%), cerebrasthenic disorders dominate, manifested by emotional incontinence, fatigue, frequent headaches of varying intensity, dizziness, impaired concentration, sleep disturbance with frequent night awakenings, irritable reactions to bright light, color, loud and sharp sounds. Typical is a slight decrease in mnestic-intellectual functions (Me=10,Q1=8,Q3=12, p=0.014), changes in behavior and activity: preoccupation with the problem (Me=7,Q1=6, Q3=9, p=0.032),, availability of functional problems: impaired functioning of gastrointestinal tract, dysfunction of the vegetative system, cardiac abnormalities, sleep problems(Me=8,Q1=6,Q3=18, p=0.001), disorders of emotional response (Me=4,Q1=2,Q3=9, p=0.004).

Clinico-psychopathologically, in group III the mental changes (n=86, 27,1%) corresponded mainly to secondary impairments of the neurotic level in the form of affective lability, represented by mood swing, normative cognitive parameters (Me=5,Q1=4,Q3=8, p=0.014), depressive tendencies (Me=6,Q1=1,Q3=10, p=0.004), functional problems (Me=3,Q1=1,Q3=6, p=0.001), changes in behaviour and activities (Me=7,Q1=6,Q3=12, p=0.032). The differences between the groups are shown in Table 2.

Table 2. K-means cluster analysis: estimation of differences between groups

Scale	p U Test	IQR	95% CI	IQR

	1-2	1-3	2-3	1-2	1-3	2-3	1-2	1-3	2-3
Functional problems	0.0000	0.1	0.009	2	1	2	1;3	0; 2	0; 3
Impairments of cognitive-analytical activities Impairments of cognitive-analytical activities	0.0000	0.0000	0.0000	3	7	4	2;5	6; 10	4; 5
Emotional response disorders	0.06	0.9	0.6	1	0	0	0;2	-1; 1	-2;1
Changes in behavior and activities	0.0000	0.1	0.0000	3	3	1	2;4	3; 4	0; 1

Note: 1-2 estimation of differences between groups 1 and 2, 1-3 − 1 and 3, 2-3 − 2 and 3; IQR – interquartile range; 95% CI IQR – 95% confidence interval of IQR

Based on the calculations of CI for medians, medians differences and CI for medians difference, as well as the results of the Mann-Wehitney U test for independent samples, the following indicators were obtained.

1. Functional problems prevail in the 2nd group of patients, compared with the 1st group (95% Cl:1-3). Calculation using the Mann-Whitney test reveals statistically significant differences between the levels of functional problems in patients of the 2nd and 3st groups (p=0,009), even when adjusting thr p-values by using Bonferroni correction.

2.According to the CI dMe and verification of hypothesis using the Mann-Whitney U test Impairments of cognitive-analytical activities differ in all groups of patients.

3. Scale levels Emotional response disorders do not differ significantly in 3 groups of patients.

4.Changers in behavior and activities are more common in patients of the 2nd group, less evident in the 1st and 3rd groups of patients.

As a result of the K-means cluster analysis, indicators of the personality profile of the crisis were obtained, which are presented in Figure 1.

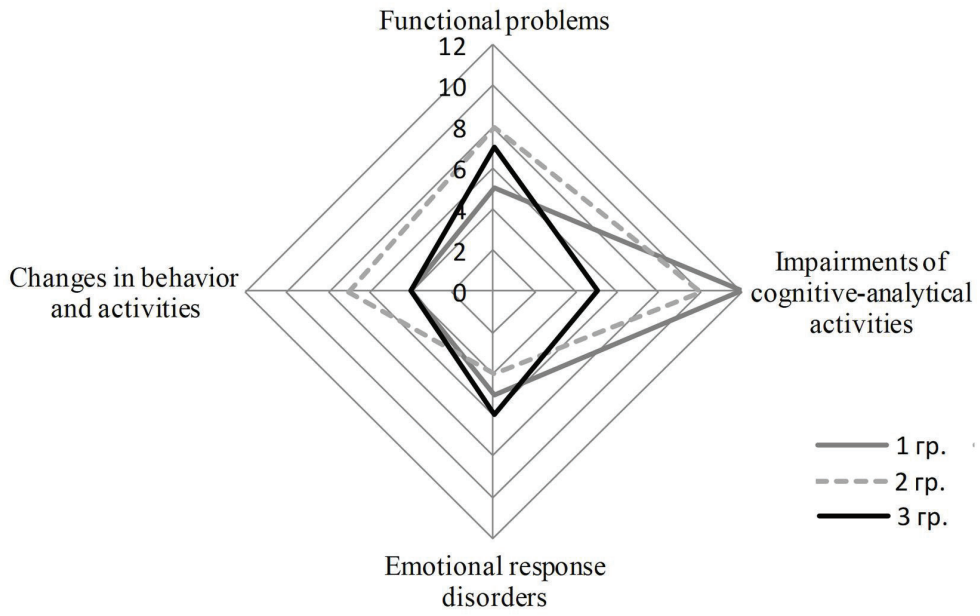

Figure 1. Diagram of indicators of the personality profile of the crisis in 3 groups, derived from K-means cluster analysis

Therefore, it can be noted that the patients of the 2nd group have the greatest distinctive features: they have a higher level of Functional problems and Changes in behaviour and activities than patients of the 1st and 3rd groups. But at the same time, in patients of the 1st group, the indicators on the scale Impairments of cognitive-analytical activities are higher than in patients of the 2nd and 3rd groups.

4. Discussion

Epilepsy is a disease that greatly affects the quality of patients life. Clinically in behavior, an important role is assigned to the study of psychological and social factors. This paper attempts to comprehensively assess the state of patients with epilepsy with an emphasis on the psychological component. The results of the study allowed us to identify 3 groups/scenarios of mental changes in the studied group of patients, taking into account the peculiarities of the internal picture of the disease, which are characterized by heterogeneous clinic-pathopsychological characteristics.

In case of unfavorable course of epilepsy, gross affective disorders, psychopathic behavior are detected clinically and psychopathologically; pathopsychological research reveals a larger severity of indicators on the scales of depression, anxiety, phobias and psychoticism, which is manifested in the prevalence of anxiety-depressive symptoms, dysphoria, suicidal tendencies, decrease in mental activity with cognitive manifestations of depression, the presence of evading/avoiding, isolated lifestyle. Among social indicators there is a high percentage of disability among the surveyed patients, a low percentage of people with higher education and a rather low professional level.

The most favorable scenario (group III) of mental changes in patients with epilepsy, predominantly reveals neurotic picture of mental changes manifested as affective lability, normative parameters of the cognitive sphere, depressive tendencies.

In group II, against the background of cerebrasthenic disorders, a slight decrease in intellectual/mental functions, changes in behavior and activities, and functional problems prevail.

In the worst scenario I, cerebrasthenic disorders combined with psychopathic and cognitive impairments are dominant.

The results of the clinico-psychological study of above options greatly complement the available findings on the epilepsy's internal picture and open up new possibilities in the differential diagnosis and in shaping a plan of treatment and rehabilitation process.

5. Conclusion

The studied indicators reflect the adaptedness-disadaptedness continuum of the patient's personality, which manifests itself as the restructure of functional structures and personality systems affected by the disease. Therefore, clinically, the psychological component becomes a significant part of the therapeutic and diagnostic process in epilepsy. Given to this component, the role of mental factors is highlighted in the therapeutic and diagnostic process, in the prevention of relapses. The findings obtained during clinical psychodiagnosis should be used by the doctor to confirm the diagnosis, serve as a criterion for the dynamics of the patient's state during treatment, delivery of psycho-correction and psychotherapy, implementation of various types of examinations and also contribute to the identification of target factors, the account of which is essential for the development of rehabilitation programs for patients with epilepsy.

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