DIAGNOSTIC CRITERIA OF COGNITIVE IMPAIRMENTS IN PATIENTS WITH MIXED DEMENTIA COMPLICATED BY HALLUCINATORY-PARANOID DISORDERS

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Abstract

The study involved 72 patients with mixed dementia complicated by hallucinatory-paranoid disorders (main group) and 61 patients with mixed dementia not complicated by psychotic disorders (control group). It was established and proved that patients with mixed dementia complicated by psychotic disorders were characterized by more expressed cognitive impairments, which were manifested in impairments of praxis, gnosis, memory, skills of counting, attention process, thinking and orientation.

Key words: *mixed dementia, diagnosis, hallucinatory-paranoid disorders, cognitive dysfunctions.*

Introduction

An older age is a risk factor for cognitive impairment development with different levels of manifestation. The peculiarities of changes in cognitive functions in the age aspect and in neurological diseases are given considerable attention [1]. The changes in cognitive activity in the elderly persons may develop against a background of dementia [2]. According to the data from the WHO, there are around 35.6 million persons with dementia in the world, which is a significant burden for the health care system and economics, even in highly developed countries [3].

Dementia, despite a considerable amount of researches, remains one of the most problematic pathologies [1, 3, 4]. On the base of the data from various studies, it has been noted that cognitive impairments of a different severity are found in 40–70% of patients with mixed dementia (MD) [2, 5, 6]. The main causes of dementia are neurodegenerative processes (the first place among them belongs to Alzheimer's disease), brain vascular diseases and their combination [4, 7]. Based on the WHO data concerning a rising incidence of dementia, scientists are forced to review their previous strategies and to find new ways of solving the problem [3, 8]. However, no progress has been made in the recent years regarding a timely diagnosis and treatment of dementia and related cognitive impairments [5, 6]. Risk factors for dementia are being actively investigated, but there are no clear recommendations to prevent its development at the moment [2, 4, 7, 8]. Particular problems in this respect arise in situations where dementia is complicated by psychopathology of the psychotic level.

2. Purposes, subjects and methods:

2.1. Purpose of the study was to determine the peculiarities of cognitive impairment in the structure of neurodegenerative processes in patients with mixed dementia complicated by hallucinatory-paranoid disorders.

2.2. Subjects & Methods

The study of cognitive disorders was performed in 72 patients with MD (F00.1 (1–2); F01.3 (1–2)) complicated by hallucinatory-paranoid disorders (the main group). Sixty-one patients with MD without hallucinatory-paranoid disorders (HPD) (F00.1; F01.3) participated in the study as the control group.

To investigate the main cognitive impairments (memory, attention, psychomotor coordination, language, gnosis, praxis, counting, thinking, orientation, planning and control of higher mental

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activity) in patients with MD complicated by HPD, such methods were used: clinical-psychopathological method (a structured interview conducted within the framework of clinical-phenomenological and psychopathological approaches in psychiatry); elementary neuropsychological examinations of basic cognitive functions in patients with dementia (compilation of pictures, understanding of narratives and plot pictures, establishment of sequence of events, classification, elimination of redundant, determination of a significant features, search of analogies, definition and comparison of concepts, formation of artificial concepts, selection of words), conducted during the structured interview process; the Mini-Mental State Examination (MMSE) Mental Status Scale [9]; Montreal Cognitive Assessment Scale (MoCa) [10].

Standard statistics used for evaluating results of the study.

Conflict of interests

The authors of the article declare no conflict of interest.

3. Results

Analysis of results of the investigation, carried out using the scales MMSE, MoCa and elementary neuropsychological examinations, to study the main cognitive impairments in patients with MD complicated by HPD in comparison with patients with MD from the control group, is presented in *Table 1*.

According to the results presented in *Table 1*, in patients with MD complicated by HPD, as compared with patients with MD without psychotic disorders, predominated cognitive impairments were: impaired visual-constructional skills (58.3±6.7% of cases, p<0.05) and writing (41.7±4.7% of cases, p <0.05); difficulties in understanding of instructions (61.1±6.9% of cases, p <0.05); impairments of a serial counting (77.8±9.5% of cases, p<0.05); a decreased level of delayed reproduction related to impairment of encoding (83.3±10.4% of cases, p <0.05); decreased concentration (70.8±8.3% of cases, p<0.05); errors in the sentence repetition (69.4±8.1% of cases, p<0.05); impaired orientation in the own personality (31.9±3.7% of cases, p<0.05).

More manifested impairments of intellectual activities in patients with MD complicated by HPD were: impairments of generalization (79.2 ± 9.9% of cases, p<0.05), formal-logical operations (84.7 ± 10.6% of cases, p<0,05), making of conclusions (83,3 ± 10,4% of cases, p<0,05), motivational component of thinking (80,6 ± 10,0% of cases, p <0,05) and criticism (90.3 ± 11.1% of cases, p<0.05).

The analysis of informativeness of highlighted by, the main cognitive impairments, identified by means of MMSE, MoCa scales and elementary neuropsychological examinations, in patients from the main group with MD, as compared with patients with the MD from the control group, is presented in *Table 2* (values are presented in order of a decreasing level of informativeness).

According to the results of the statistical analysis presented in *Table 2*, in patients with MD complicated by HPD (the main group), the most informative cognitive function impairments were: impairments of a motivational component of thinking (heterogeneity, paralysis, inconsistency, disconnectivity, symbolism) (DC = - 2.14, MI = 0.34, p<0.0001); impairments of criticism (DC = - 1.85, MI = 0.29, p<0.00002); impairments of generalization (insufficiency of the level of generalization, its distortion) (DC = - 1.65, MI = 0.21, p <0.001); impaired orientation in the own personality (DC = - 2.48, MI = 0.17, p <0.03). Also, in patients with MD complicated by HPD, significant cognitive function impairments, which increased a level of diagnostic informativeness, were: an impaired making of conclusions (DC = - 1.38, MI = 0.16, p<0.002); impairments of praxis (impairments of writing) (DC = - 2.01, MI = 0.16, p<0.03); impairments of formal-logical operations (DC = - 1.34, MI = 0.15, p<0.002); an impaired concentration (DC = - 1.44, MI = 0.14, p<0.009); impairments of counting (DC = - 1.20, MI = 0.11, p<0.01); delayed reproduction impairments related to impairments of encoding (DC = - 1.15, MI = 0.11, p <0.006); impaired visual-constructional skills (DC = - 1.20, MI = 0.10, p <0.04); impairments of gnosis (difficulties in understanding of instructions) (DC = - 1.09, MI = 0.10, p <0.04); speech impairments (errors in repetition of sentences) (DK = - 1.22, MI = 0.10, p <0.02).

Therefore, in patients with MD complicated by HPD, more pronounced cognitive impairments were identified, in comparison with the patients with MD without psychotic disorders. These impairments were manifested as impairments of praxis, gnosis, memory, counting skills, attention, thinking, and orientation.

The revealed peculiarities of cognitive decline in MD confirm the data of other researchers that in these cases of the disorder there are specific cognitive impairments characteristic of diseases associated with frontal lobe dysfunction: this is a decrease in concentration, impaired ability to plan one's actions, and mental retardation works [13,

Table 1

Number of patients with mixed dementia complicated by hallucinatory-paranoid disorders, which had impairments of cognitive function (% ±m)

Cognitive function and methods of their diagnosis	Main group	Control group
1	2	3
Impairments of praxis (impaired ability to acquire, retain and use various motor skills)		
Errors in creating alternate path (MoCa)	48.6 ± 5.3	39.3 ± 5.1
Visual-constructional impairments (MoCa and MMSE)	37.5 ± 4.3	37.7 ± 5.0
Impairments of visual-constructional skills (MoCa)	58.3 ± 6.7 *	44.3 ± 5.4
Impairments of writing (MMSE)	41.7 ± 4.7 *	26.2 ± 4.1
Gnosis impairments (impairments of the function of perception of information, its processing and synthesis of elementary sensory sensations into holistic images, inability to holistic perception, recognition)		
Errors in naming objects, animals, etc. (MoCa and MMSE)	44.4 ± 4.9	34.4 ± 4.7
Problems with understanding of instructions (MMSE)	61,1 ± 6,9 *	47,5 ± 5,7
Impairments of counting		
Errors in a serial subtraction (MMSE)	77.8 ± 9.5 *	59.0 ± 6.7
Memory impairments (impaired ability to absorb, store and reproduce the information needed for a current activity)		
Delayed reproduction impairments related to impairments of retrieval (MoCa)	88.9 ± 11.0	75.4 ± 8.2
Delayed reproduction impairments related to impairments of encoding (MoCa)	83.3 ±10.4*	63.9 ± 7.1
Impairments of attention		
Impairments of stability (mobility (distraction, inertness) and exhaustion) of attention (MoCa)	55.6 ± 6.2	45.9 ± 5.6
Impairments of concentration (MoCa and MMSE)	70.8 ± 8.3 *	50.8 ± 6.0
Language impairments (impaired ability to communicate by means of sentences)		
Errors in sentence repeating (MoCa and MMSE)	69.4 ± 8.1 *	52.5 ± 6.1
Impairments of the speech speed (MoCa)	65.3 ± 7.5	54.1 ± 6.2
Impairments of reading (MMSE)	48.6 ± 5.3	37.7 ± 5.0
Impairments of thinking		
Impairments of generalization: insufficiency of a level of generalization, its distortions (understanding of plot pictures, understanding of a series of plot pictures, tasks for classification)	79.2 ± 9.9 *	54.1 ± 6.2
Impairments of detection of similarities and differences (the exception task – redundant the third, classification of geometric figures)	61.1 ± 6.9	59.0 ± 6.7
Impairments of formal-logical operations (ending of a series of pictures, selection of analogies, tasks for classification, search for essential features)	84.7 ±10.6*	62.3 ± 7.0
Impairments of associative links (tasks to determine essential features, definition and comparison of concepts, comparison of analogies)	63.9 ± 7.2	60.7 ± 6.9
Impaired making of conclusions (understanding of stories and plot pictures, establishing of sequence of events, understanding of a figurative meaning of proverbs, metaphors, sayings)	83.3 ±10.4*	60.7 ± 6.9
Impairments of abstract thinking (MoCa, method of artificial concepts formation, relationships establishing)	73.6 ± 8.8	68.9 ± 7.6
Impairmentsof the dynamics of thinking: acceleration, deceleration, delay, lability / inertness, perseveration, inconsistency (clinicalpsychopathological method)	61.1 ± 6.9	62.3 ± 7.0
Impairments of a motivational component of thinking: heterogeneity, paralogism, inconsistence, disconnection, symbolism, autism, resonance (clinical-psychopathological method)	80.6 ±10.0*	49.2 ± 5.9
Impairments of criticism (clinical-psychopathological method)	90.3 ±11.1*	59.0 ± 6.7
Orientation		
Impairments of the time orientation (year, month, date, and day of the week) (MoCa and MMSE)	66.7 ± 7.7	65.6 ± 7.3
Impairments of space or locational orientation (country, city, street, institution) (MoCa and MMSE)	51.4 ± 5.7	42,6 ± 5.3
Impairments of orientation in the own personality (clinical-psychopathological method)	31.9 ± 3.7 *	18.0 ± 3.6

Symbols: * – differences are statistically significant at $p < 0.05$.

Table 2

Diagnostic coefficients and measure of informativeness of main cognitive impairments identified in patients with MD from the main group

Cognitive impairments	Manifestation (points)	DC *	MI**
Impairments of the motivational component of thinking	–	-2.14	0.34
Impairments of criticism	–	-1.85	0.29
Impairments of generalization (insufficiency of generalization, its distortion)	–	-1.65	0.21
Impairment of orientation in the own personality	–	-2.48	0.17
Impairments of making of conclusions	–	-1.38	0.16
Impairments of praxis (impairments of writing)	= 0	-2.01	0.16
Impairments of formal-logical operations	–	-1.34	0.15
Impairments of attention (concentration)	= 0	-1.44	0.14
Impairments of the counting (errors in a serial subtraction)	³ 1	-1.20	0.11
Memory impairments (delayed reproduction impairments related to impairments of encoding)	³ 1	-1.15	0.11
Impairments of praxis (impairments of visual-constructional skills)	³ 2	-1.20	0.10
Gnosis impairments (impairments of understanding of instructions)	³ 1	-1.09	0.10
Speech impairments (errors in repetition of sentences)	³ 1	-1.22	0.10
Total set of the signs		-20.15	2.14

Symbols: * – diagnostic coefficient; ** – Kullback measure of informativeness.

16, 17]. It has been noted by a number of authors that in mixed-type dementia, the greatest cognitive differences are observed in the visual-spatial sphere, working memory, but no significant differences in regulatory functions and episodic memory were found [14, 15, 17]. Violation of regulatory functions is considered an essential sign of the contribution of the vascular factor to the picture of cognitive decline in MD [14]. The results of a neuropsychological assessment of cognitive impairment in MD complicated by HPD obtained in this study show that cognitive impairment in this disorder is more pronounced.

Thus, the data obtained should be taking into account in the diagnosis and treatment of patients with MD complicated by HPD.

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