

## **Chronic Brain Ischemia in Hypothyroidism**

**Rejabboev Oyatillo**

Fergana Medical Institute of Public Health, Department of Neurology and psychiatry

**Abstract:** Endocrinopathy is one of the significant risk factors for cerebrovascular diseases. The number of such patients is constantly increasing in all economically developed countries of the world. Hypothyroidism is one of the most common endocrine diseases and is also an important medical and social problem.

**Keywords:** Hypothyroidism, encephalopathy, levothyroxine sodium, MM SE scale.

**Introduction.** Endocrinopathy is one of the significant risk factors for cerebrovascular diseases. The number of such patients is constantly increasing in all economically developed countries of the world. Hypothyroidism is one of the most common endocrine diseases and is also an important medical and social problem. Hypothyroid neurological disorders have now become one of the most common and over the years are being promoted to one of the first places, and the improvement of their diagnosis and treatment has become one of the most urgent tasks of neurology.

**Materials and methods of research:** To achieve the set goal, 50 patients with hepatic encephalopathy of various etiologies were studied.

I. Clinical and neurological research methods.

II . Paraclinical research methods:

1) Neuroimaging research methods:

A ) Electroencephalography

III . Neuropsychological research methods (adapted neuropsychological tests)

1) Mental status assessment scale, MMSE ( FolsteinM . F. etal , 1975)

2) Battery of tests for assessing frontal dysfunction - BTLD (English: Frontal Assessment Battery - FAB)

3) Clock drawing test

4) SMIL (standardized multidisciplinary questionnaire for personality research)

5) Beck's Depression Inventory

6) Spielberger a - Khanin test to identify personal anxiety

7) ADL questionnaire

IV . Treatment methods and comparison of their effectiveness:

V. \_ Statistical research methods and statistical processing.

These studies were performed on the basis of the neurological and therapeutic departments of the FZhTI clinics, urban polyclinics of the city of Fergana.

**Research results.** Thus, in patients in the study groups, vertebrobasilar basin lesions were clinically noted in 100% of cases in the form of cochleovestibular and vestibulo -ataxic syndromes. The severity of neurological symptoms was determined by the stage of CNMC.

According to CT and MRI of the brain, in the studied groups of patients, more often than in the control groups, multiple small circulatory foci were detected , localized in the cerebral cortex, periventricular regions, in the basal ganglia, thalamus, pons, cerebellum; varying degrees of atrophic changes in the brain in the form of expansion of the ventricular system and cortical furrows; periventricular leukoaraiosis .

During MRI of the brain, anomalies of the craniovertebral junction (basilar impression, platybasia , Arnold- Chiari anomaly ) were detected in 20.83% of cases (10 people) in the studied groups of patients; in control - in 16.25% (8 people).

In the group of patients with stage II CNMC with hypothyroidism, mild disorders of higher nervous activity were diagnosed in 11 people (22% %); moderate - in 5 people (10%). In the control group of patients, mild disorders were detected in 3 people (12%); moderate - in 6 people (24%).

In patients with stage III CNMC with hypothyroidism, the following disorders of higher nervous activity were determined: moderate - in 18 people (36%); severe disorders reaching the degree of dementia - in 4 people (8%). In the control group of patients - in 2 people (8%) and 3 patients (12%), respectively.

Analysis of the results on the MM S E scale shows that impairments to higher cortical functions are more pronounced in patients with hypothyroidism. There were lower scores in tests for orientation in time and space, in tests for memory and perception, for concentration of attention and serial counting (  $p < 0.05$ ) compared with control groups. In the study of speech, disorders were detected in patients in the study and control groups, but patients with CNMC and hypothyroidism were more absent-minded and had difficulty concentrating.

In the study of tests on the "frontal dysfunction battery", violations of higher mental functions prevailed in groups of hypothyroid patients (  $p < 0.05$ ). When performing a test for fluency of speech, a pronounced disorder of voluntary reproduction of the material was noted when naming words starting with the letter "s" with eyes closed for 1 minute. Violations in the similarity test (conceptualization) were more often registered in patients with CNMC with hypothyroidism. In the study of dynamic praxis , more severe manifestations of spatial apraxia were observed in patients with CNMC and hypothyroidism.

**Table . The results of testing on the MMSE scale in patients with CNMK II and CNMK III stages**

MM8E tests	Patients with HNMK II stage with hypothyroidism and without hypothyroidism		Patients with stage III CNMC with and without hypothyroidism	
	IG	KG	IG	KG
Total score	24.6 ± 0.4*	26.9±0.5	21.3±0.5*	23.8±0.3
Time Orientation	4.8±0.1	4.9±0.2	4.3±0.2	4.4±0.1
Orientation in place	4.9±0.1	4.9±0.08	4.5±0.1	4.5±0.3
Perception	2.6±0.08	2.7±0.1	2.3±0.07	2.4 ± 0.2
concentration and counting	3.3±0.2*	3.8±0.2	2.6±0.2*	3.2±0.1
Memory	2.2±0.08*	3.2±0.1	1.8 ± 0.1*	2.7 ± 0.09
Speech features	6.8±0.1*	7.4 ± 0.09	5.8 ± 0.08*	6.5±0.2

Note: \*  $p < 0.05$  - significance of differences in relation to the control group; IG - study group; CG - control group.

The test for memorization of 5 words (visual memory test) made it possible to evaluate delayed reproduction, the effectiveness of categorical prompts and recognition (Table 3). In patients in the study groups with severe manifestations of CNMC, reproduction, especially delayed, recognition decreased, and semantic (categorical) prompts did not bring the proper positive result.

When conducting psychometric testing, disturbances in the emotional and volitional sphere were revealed in all patients with CNMC and hypothyroidism in the form of decreased mood, irritability, inability to relax, increased fatigue, lethargy, rapid exhaustion after minimal exertion, general weakness, and in the early stages of CNMC in the study groups. patients, a critical attitude of patients to their condition was noted.

According to the evaluation of the results of the hospital scale of anxiety and depression, it was noted that anxiety and depressive disorders were clinically more pronounced in patients with hypothyroidism ( $p < 0.05$ ) and prevailed in the studied groups of patients in the early stages of CNMC (Table 4).

Conducting a survey using the Beck questionnaire made it possible to identify a measure of the depth of depression (Table 4). In patients with HNMC and hypothyroidism, a mild level of depression was noted in 62.5% of observations (315 people); severe depression - in 30% (15 people) and the absence of depressive tendencies, a good emotional state - in 7.5% of observations (3 people). In the control groups of patients, similar figures were 35% (8 people), 18.75% (4 people) and 46.25% (11 people), respectively.

When testing on the Spielberger self-assessment scale, the subjective level of personal and situational anxiety was revealed (Table 4). Patients with a high level of anxiety prevailed in the groups of patients with CNMC with hypothyroidism - 34 patients (69%), in the control groups - 6 patients (25%). Moderate anxiety was detected in 11 patients (22%) in the study groups and in 5 patients (22.5%) in the control groups. A low level of anxiety was more often detected in patients without hypothyroidism - 13 people (52.5%) compared with hypothyroid patients - 4 people (9.16%).

**The effectiveness of levothyroxine sodium in the examined group of patients** The results obtained on the MMSE scale (Fig. 8) indicate the absence of cognitive dysfunctions before the start of treatment in 45% of patients; 33% had mild cognitive impairment; 11% have moderate pre-dementia cognitive disorders; 11% had mild dysmnestic dementia. After treatment, the absence of cognitive impairment increased by 10% and was observed in 56% of patients; mild cognitive impairment decreased by 11%; the percentage of moderate cognitive impairment and mild dysmnestic dementia did not change, amounting to 11%, which may indicate the irreversibility of the consequences as a result of long-term decompensation.

### **Conclusion.**

- 1) In all patients with CNMC with hypothyroidism with multiple focal lesions and brain atrophy, violations of several higher cortical functions (memory, praxis, gnosis) were revealed. The degree of their severity corresponds to the stage of chronic cerebrovascular insufficiency and prevails in comparison with the control group of patients.
- 2) Psychoemotional disorders in patients with chronic cerebrovascular insufficiency with hypothyroidism are detected in the early stages of the disease in 100% of cases, anxiety and depressive disorders prevail in multiple focal lesions and brain atrophy.
- 3) The appointment of thyroid drugs significantly affects the regression of emotional-volitional and cognitive disorders and helps to reduce the severity of neurological symptoms.

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