

spots and papules on the skin of the trunk and extremities. On the skin, when rubbing the elements, their reddening and blistering were noted, which indicated a positive Darier-Unna symptom.

The diagnosis was made on the basis of major criteria: characteristic clinical picture of the rash and positive Darier-Unne's symptom, as well as on the basis of laboratory tests: increase of total tryptase (20 ng/ml) in blood serum and data of instrumental methods of examination: increase of spleen. No manifestations of systemic mastocytosis were revealed. Clinical diagnosis: Mastocytosis, cutaneous form. Pigmented urticaria.

The child was prescribed antihistamines (zirtek drops 5 drops 2 times a day for 30 days), external treatment (emollients and root protectors - emolium cream, atopik, locobase ripea).

Recommendations: Dispensary observation by a pediatrician, allergologist-immunologist and dermatologist. Hypoallergenic diet: exclude cottage cheese, cheese, beef. Medical therapy: antihistamines for up to 1 month. The

treatment with emollients and root protectors.

**Conclusion:** Cutaneous mastocytosis is a rare disease with a relatively favorable prognosis in children. Due to low incidence, diagnosis is often difficult. Therefore, we present a clinical case of a child with the cutaneous form of mastocytosis. All children with mastocytosis should be registered by a pediatrician, an allergist and a dermatologist because of the possibility of transition to the systemic form at an older age.

## Reference

1. Kasikhina E.I., Kruglova L.S., Vashchenko M.O. [et al.] Analiz faktorov riska, vliyayushchih na techenie mastocitoza kozhi u detej: odnomomentnoe issledovanie [Analysis of risk factors affecting the course of skin mastocytosis in children: a one-stage study]. *Voprosy sovremennoj pediatrii* [Issues of modern pediatrics. 2020; 19 (6): 526-530 (In Russ.).] DOI: 10.15690/vsp.v19i6.2154
2. Belykh N.A., Pisnyur I.V., Ieshkina M.N. [et al.] Klinicheskij sluchaj kozhnogo mastocitoza v praktike vracha-pediatra [Clinical case of cutaneous mastocytosis in the practice of a pediatrician].

*Rossiiskij pediatrik. zhurnal* [Russian Pediatric Journal. 2022; 3(1): 56 (In Russ.).]

3. Potapenko V.G., Baykov V.V., Boychenko E.G. [et al.] Mastocitoz u detej. Prospektivnoe issledovanie 163 pacientov s pomoshch'yu distancionnogo anketirovaniya roditel' [Mastocytosis in children. Prospective study of 163 patients using remote questioning of parents]. *Rossiiskij zhurnal detskoj gematologii i onkologii* [Russian Journal of Pediatric Hematology and Oncology. 2021; 8(2): 13-25 (In Russ.).] DOI: 10.21682/2311-1267-2021-8-2-13-25

4. Shkurlatovskaya K.M., Orlova A.S., Silina E.V. [et al.] Molekulyarno-geneticheskie mekhanizmy mastocitoza [Molecular genetic mechanisms of mastocytosis]. *Patologicheskaya fiziologiya i eksperimental'naya terapiya* [Pathological physiology and experimental therapy. 2019; 63(3): 127-33 (In Russ.).] doi: 10.25557/0031-2991.2019.03.127-133.

5. Khaliulin Yu.G. Mastocitoz: klinicheskie proyavleniya, metody diagnostiki i taktika vedeniya pacientov [Mastocytosis: clinical manifestations, diagnostic methods and tactics of patient management]. *Lechashchij vrach* [The attending physician. 2012; 8: 12-14 (In Russ.).]

6. Chernavina K.M., Orlova A.S., Nikitin E.A. Lechenie pacientov s mastocitozom: obzor literatury [Treatment of patients with mastocytosis: a review of the literature]. *Klinich. Onkogematologiya* [Clinical oncohematology. 2021; 14(3): 1-9 (In Russ.).] DOI: 10.21320/2500-2139-2021-14-3-361-369

DOI 10.25789/YMJ.2023.81.33

УДК 616.858-008.6

L.I. Kopylova, T.Ya. Nikolaeva, Yu.E. Semenova,  
A.A. Tappakhov

## PARKINSON DISEASE AND ISCHEMIC STROKE (CLINICAL CASE)

Parkinson's disease (PD) – is a chronic neurodegenerative disease that ranks 2nd in prevalence in the world and has a steadily progressive course. It is clinically manifested by motor disorders in the form of hypokinesia, muscle rigidity and/or rest tremor. In addition, patients have non-motor symptoms, some of which may occur long before the development of typical motor manifestations. Cerebrovascular diseases are in the first place in terms of mortality and disability. A number of studies have revealed that PD reduces vascular risk factors due to low activity of the sympathetic part of the autonomic nervous system, disorders of the hypothalamic-pituitary-adrenal axis, as well as due to treatment with dopaminergic drugs. Contradictory results are expressed by a number of other authors, according to which PD is associated, on the contrary, with an increase in the risk of stroke. This article presents a clinical case of a patient with an established diagnosis of PD who has developed an ischemic stroke. The possible mechanisms of the combination of two diseases, the influence of the neurodegenerative process on the recovery processes and the timing of hospitalization are discussed.

**Keywords:** Parkinson disease, ischemic stroke, non-motor symptoms, cognitive impairment.

**KOPYLOVA Liliya I.** – Assistant of the Department of Neurology and Psychiatry of the Medical Institute, M. K. Ammosov North-Eastern Federal University, post-graduate student of 2 years of study, e-mail: kopylovalilya@mail.ru, ORCID: <https://orcid.org/0000-0003-3570-3403>, **NIKOLAEVA Tatiana Ya.** – MD, Professor, Head of the Department of Neurology and Psychiatry of the Medical Institute, M.K. Ammosov North-Eastern Federal University, e-mail: tyanic@mail.ru, ORCID: <https://orcid.org/0000-0002-4201-8570>, **TAPPAKHOV Alexey A.** – Candidate of Sciences in Medicine, Associate Professor at the Department of Neurology and Psychiatry of the Medical Institute, M.K. Ammosov North-Eastern Federal University, Senior Researcher in the Yakut Scientific Center for Complex Medical Problems (Yakutsk), e-mail: tappakhov@gmail.com, ORCID: <https://orcid.org/0000-0002-4159-500X>, **SEMENOVA Yulia E.** – neurologist of the Republican Hospital № 2-TSEMP, e-mail: j-kor87@mail.ru

**Introduction.** Parkinson's disease (PD) – is a chronic neurodegenerative disease associated with the loss of dopaminergic neurons in the striatum with the accumulation of Levi bodies [1, 2, 5]. Several factors play a role in the development of PD, including genetic predisposition and environmental factors [1, 2]. PD ranks 2nd in prevalence among neurodegenerative diseases after Alzheimer's disease, reaching 1% in the group of people over 60 years old and up to 4% in people over 75 years old [10]. It is clinically manifested by motor disorders (hypokinesia, muscle rigidity, rest tremor) and a wide range of non-motor symptoms

(affective, cognitive, sensory, vegetative, and others) [6, 8].

PD can occur in combination with other neurodegenerative and/or vascular diseases of the brain, including acute disorders of cerebral circulation (ONMC) [4, 9]. Stroke is the most important medical and social problem of the elderly, is in the first place in terms of prevalence, mortality and disability [3, 11]. The combination of PD and cerebrovascular diseases can vary from 8.6% to 12% [4]. There is a lot of contradictory data about the relationship between BP and ONMC. It has been established that PD reduces the activity of the sym-

pathetic part of the autonomic nervous system, thereby reducing the frequency of vascular risk factors, especially when treated with dopaminergic drugs [7]. According to G. Scigliano and colleagues (2006), the reduction in the risk of vascular catastrophes in patients with PD is explained by a violation of the hypothalamic-pituitary-adrenal axis [17]. In 2009, Scigliano Ji, Ronchetti and co-authors in a retrospective study revealed that taking levodopa drugs is associated with a decrease in vascular risk factors [18]. On the contrary, a 2013 study by the authors of Hong Kong University showed that PD is associated with an increased risk of ischemic stroke and higher stroke-related mortality [16]. Scientists from the UK came to similar results in 2020 [13]. Thus, both the risks of developing ONMC and the very course of stroke in patients with PD probably have their own characteristics. In this article, we present our own clinical observation of a patient suffering from PD for a long time, who developed an ischemic stroke.

**Clinical case:** Patient N., 78 years old, has been suffering from Parkinson's disease for the last 4 years. The disease began with a tremor of rest of the right hand, hypokinesia on the right. Considering the age of onset of the disease (after 70 years) drug therapy was started with levodopa preparations (levodopa / carbidopa) with titration up to 750 mg / 75 mg per day in three doses with a positive effect in the form of a significant reduction in tremor, hypokinesia. However, despite the therapy, the disease had a progressive course with the addition of symptoms on the left side.

On September 11, 2022, there was acute weakness and numbness in the left extremities. Within 3 hours after the onset of the disease, she was hospitalized in the Regional Vascular Center of the Republican Hospital №2 – the Emergency Medical Center of Yakutsk with ischemic stroke in the basin of the right middle cerebral artery.

**Chronic diseases:** a long-lasting persistent form of fibrillation-atrial flutter, tachysystolic variant. Sinus node weakness syndrome. Condition after implantation of an electrocardiostimulator (2017). Coronary heart disease. Angina pectoris of tension 2 FC. Hypertension stage 3. Arterial hypertension of the 3rd degree. Risk of MTR 4. Atherosclerosis of the arteries of the lower extremities.

**Constant medication:** rivaroxaban 20 mg, bisoprolol 2.5 mg, levodopa / carbidopa 750 mg / 75 mg per day in three doses.

**Neurological status upon admission:**

Clear consciousness. The contact is complete. The behavior is calm. The eye slits are equal, the pupils are equal. The movement of the eyeballs in full, there is no nystagmus. The exit points of the branches of the trigeminal nerve are painless. Sensitivity on the face is reduced on the left. The nasolabial fold on the left has been smoothed. The pharyngeal reflex is alive. The tongue deviates to the left. Left-sided hemiplegia. Muscle tone is higher on the left, increased on the right by the type of "gear wheel", oligobradycinesia, rest tremor on the right by the type of "coin counting". Tendon reflexes are alive, D>S. Babinsky's symptom on the left. The rigidity of the occipital muscles is negative, Kernig's symptom is 90 on both sides. Hyperkinesia is absent. Coordination tests on the left does not perform due to paresis, on the right performs well. Left-sided hemihypesthesia. Mild dysarthria.

NIHSS – 13 points, Com Glasgow scale – 15 b, Rankin scale – 4 points, Rivermead scale – 0 b.

**Neuropsychological status:** MoCA – 11/30 (decrease due to the test of drawing hours, visual-constructive skills, decreased attention, phonetic activity of speech, abstraction, memorization of 5 words). The drawing test of the clock is 1/3 points, non-abstract (a symptom of ignoring the left side). According to the hospital Anxiety and Depression Scale (HADS) test, the anxiety level is 8 points, the depression level is 8 points. The Epworth sleepiness scale is 0 points. The scale of non-motor symptoms of BP NMSQuest is 10 points (unexplained pain, unexplained weight fluctuations, decreased attention, memory, feeling of sadness, anxiety, falls, intense dreams, talking, unpleasant sensation in the legs).

Computed tomography of the brain at the arrival of signs of hemorrhage, ischemic changes were not revealed.

In the general blood test: leukocytes –  $9,3 \times 10^9/l$ , erythrocytes –  $3,6 \times 10^{12}/l$ , hemoglobin – 110 g/l, platelets –  $152 \times 10^9/l$ , ESR – 34 mm/h.

Lipid profile: cholesterol – 5.9 mmol/l; HDL – 1.49 mmol/l; LDL – 3.96 mmol/l; TG – 0.95 mmol/l.

Ultrasound of the brachiocephalic arteries revealed thrombosis in the bifurcation area of the common carotid and internal carotid arteries on the right. Stenosis in the bifurcation area of the common carotid artery on the left up to 27%, at the mouth of the internal carotid artery on the left up to 45%, at the mouth of the external carotid artery on the left up to 30%.

Taking into account the anamnesis of the disease, the clinic, computed tomog-

raphy data, thrombosis in the area of bifurcation of the common carotid artery, an ischemic stroke was diagnosed in the basin of the right middle cerebral artery from 11.09.2022, of unknown etiology according to TOAST.

Thrombolysis was not performed due to coagulogram parameters (APTT is higher than the reference values of 53.7 sec).

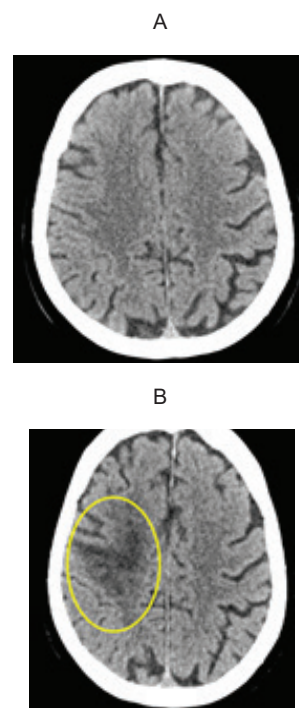
The patient had an attempt of thromboextraction.

The next day after hospitalization (12.09.2022) there is no positive dynamics, left-sided hemiplegia persists.

On the CT scan of the brain from 12.09.2022, the appearance of a hypodensive area in the frontal-parietal region on the right is noted (Figure).

During the stay in the hospital, minimal dynamics is noted: minimal movements appeared in the left extremities. There were 23 bed days in the department. Taking into account the minimal positive dynamics, the increase in strength in the left extremities to 1.5 points was directed to the 2nd stage of rehabilitation. During his stay in the hospital, antiparkinsonian therapy was continued.

**Discussion.** A clinical case of a patient with ischemic stroke suffering from PD for a long time is presented. The cause of the stroke could be both car-



CT scan of the head of patient L.: A – structural changes are not detected in the images from 11.09.2022 (3 hours after the onset of symptoms); B – in the images from 12.09.2022, the zone of acute ischemia in the frontal-parietal region on the right is revealed

diogenic embolism and stenosis-thrombosis of the brachiocephalic arteries. In addition to increasing the length of hospitalization of patients with PD and stroke, they may have more frequent development of systemic complications and post-stroke cognitive impairment.

Given the increasing numbers of PD and stroke, meta-analyses were conducted to identify the relationship. The authors report that PD and stroke have common pathogenetic connections, as evidenced by age dependence, general mitochondrial dysfunction, and the fact that after a stroke, Parkinsonism syndrome occurs, as well as the disease itself [12]. In another cohort study, the authors found that PD affects the length of hospital stay, increases the risk of developing pneumonia, sepsis, reduces the risk of death in the short term, but leads to an increased risk 1 and 3 months after a stroke [15]. In a randomized large-scale study, it was revealed that PD has a significant causal relationship with ischemic stroke, namely with two types of stroke: cardioembolic and atherothrombotic variants [14].

Many aspects of the combination of PD and cerebrovascular diseases still remain open. For example, there is no consensus on the impact of PD on stroke risks, what are the exact mechanisms of the relationship between the two diseases. However, there is no doubt that in patients with PD, recovery will be worse and slower.

*The authors declare that there is no conflict of interest.*

## Reference

1. Tappahov AA, Popova TE, Nikolaeva TYa, et.al. Geneticheskaya osnova bolezni Parkinsona [The genetic basis of Parkinson's disease]. Nevrologiya, neyropsihiatriya, psichosomatika [Neurology, neuropsychiatry, psychosomatics]. 2017;9(1): 96–100 (in Russ.).
2. Illarionov SN. Sovremennye predstav-
- leniya ob etiologii bolezni Parkinsona [Modern ideas about the etiology of Parkinson's disease]. Nevrologicheskij zhurnal [Neurological journal]. 2015;20(4): 4–13 (in Russ.).
3. Kovalenko EA, Bogolepova AN. Rol' ne-jrodegenerativnoj patologii v formirovanii postinsul'tnyh kognitivnyh rasstrojstv [The role of neurodegenerative pathology in the formation of post-stroke cognitive disorders]. Consilium Medicum [Consilium Medicum]. 2017; 19 2(1): 70–77 (in Russ.).
4. Bajborodina IV, Zavadovskaya VD, Zhukova NG, et. al. Kompleksnaya ocenka parametrov mozgovogo krovotoka i pokazatelej cerebrovaskulyarnoj reaktivnosti po dannym funktsional'nyh prob u pacientov s boleznyu Parkinsona i sosudistoj patologiej. [Comprehensive assessment of parameters of cerebral blood flow and indicators of cerebrovascular reactivity according to functional tests in patients with Parkinson's disease and vascular pathology]. Sibirskij medicinskij zhurnal [Siberian medical journal]. 2020; 35(2):140–148 (in Russ.). DOI:10.29001/2073-8552-2020-35-2-140-148
5. Levin OS, Fedorova NV. Bolezn' Parkinsona [Parkinson's disease]. M.: MEDpress-inform [M.: MEDpress-inform. 2012: 352 (in Russ.).]
6. Levin OS. Nedvigatel'nye (nemotornye simptomy) proyavleniya bolezni Parkinsona: diagnoz i lechenie [Non-motor symptoms of Parkinson's disease: diagnosis and treatment]. Bolezn' Parkinsona i rasstrojstvo dvizhenij. Rukovodstvo dlya vrachej po materialam 1 nacional'nogo kongressa [Parkinson's disease and movement disorder. Guidelines based on the materials of the 1st national congress. 2008:94-96 (in Russ.).]
7. Gerceev VN, Stoyanov AN, Mashchenko SS, et.al. Novye patogeneticheskie aspekty vzaimosvyazi nekotorykh faktorov riska cerebrovaskulyarnykh zabolevanij i bolezni Parkinsona [New pathogenetic aspects of the relationship between some risk factors for cerebrovascular diseases and Parkinson's disease]. Praktikum yushchij nevrolog [Practicing neurologist. 2019;7(109):37-41 (In Russ.).] DOI: 10.22141/2224-0713.7.109.2019.183011
8. Nodel M.R., Yahno N.N. Nedvigatel'nye narusheniya pri bolezni Parkinsona i ih vliyanie na kachestvo zhizni [Non-motor disorders in Parkinson's disease and their impact on quality of life]. Bolezn' parkinsona i rasstrojstvo dvizhenij. Rukovodstvo dlya vrachej po materialam 1 nacional'nogo kongressa [Parkinson's disease and movement disorder. Guidelines for doctors based on the materials of the 1st national congress. 2008: 92-93 (in Russ.).]
9. Ovsyannikova NA, Ar'ev AL, Zhulev NM. Cerebrovaskulyarnye zabolevaniya i komorbid-
- nye sostoyaniya – novye predstavleniya problem [Cerebrovascular diseases and comorbid conditions - new ideas of the problem]. Vestnik Sankt-Peterburgskogo universiteta [Bulletin of St. Petersburg University. 2011;11(2):147–154 (in Russ.)]
10. Razdorskaya VV, Voskresenskaya ON, YUdina GK. Bolezn' Parkinsona v Rossii: rasprostranennost' i zabolevaemost' (obzor) [Parkinson's disease in Russia: prevalence and incidence (review)]. Saratovskij nauchno-meditsinskij zhurnal [Saratov Scientific Medical Journal. 2016;12 (3): 379-384 (in Russ.).]
11. Skvorcova VI, Alekseeva GS, Trifonova NYu. Analiz mediko-organizatsionnykh meropriyatij po profilaktike insul'tov i reabilitatsii postinsul'tnykh sostoyanij na sovremennoy etape [Analysis of medical and organizational measures for the prevention of strokes and rehabilitation of post-stroke conditions at the present stage]. Elektronnyy nauchnyy zhurnal [Electronic scientific journal. 2013: 1(29) (in Russ.).]
12. Association Between Stroke and Parkinson's Disease: a Meta-analysis. Y Liu, L Xue, Y Zhang [et al.]. J Mol Neurosci. 2020;70(8):1169-1176. DOI: 10.1007/s12031-020-01524-9.
13. Becker C. Risk of stroke in patients with idiopathic Parkinson disease. C.Becker, S.S. Jick, C.R. Meier. Parkinsonism Relat Disord. 2010;16(1):31-5. DOI: 10.1016/j.parkreldis.2009.06.005.
14. Parkinson's Disease and Ischemic Stroke: a Bidirectional Mendelian Randomization Study. S Fang, X Hu, T Wang [et al.]. Transl Stroke Res. 2022;13(4):528-532. DOI: 10.1007/s12975-021-00974-6.
15. Parkinson's disease and patient related outcomes in stroke: A matched cohort study. J.A Perdomo-Lampignano, T.A Pana, I Sleeman [et al.]. J Stroke Cerebrovasc Dis. 2020;29(7):104826. DOI: 10.1016/j.jstrokecerebrovasdis.2020.104826
16. Parkinson's Disease Is Related to an Increased Risk of Ischemic Stroke-A Population-Based Propensity Score-Matched Follow-Up Study. Y.P Huang, L.S Chen, M.F Yen [et al.]. PLoS ONE.2013; 8(9). DOI: 10.1371/journal.pone.0068314.
17. Reduced risk factors for vascular disorders in Parkinson disease patients: a case-control study. G. Scigliano, M. Musicco, P. Soliveri [et al.]. Stroke. 2006; 37(5): 1184-8. DOI: 10.1161/01.STR.0000217384.03237.9c.
18. Sympathetic modulation by levodopa reduces vascular risk factors in Parkinson disease. Scigliano G, Ronchetti G, Girotti F [et al.]. Parkinsonism Relat Disord. 2009;15(2):138-43. DOI: 10.1016/j.parkreldis.2008.04.036.