



## ANALYSIS OF NEUROIMAGING AND NEUROPHYSIOLOGICAL INDICATORS IN PATIENTS WITH PARKINSON'S DISEASE

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### Relevance of the Topic

The role of MRI in diagnosing the disease was used only to exclude such changes as tumors, subdural hematomas, cerebral vascular disease, and hydrocephalus, which can cause secondary Parkinsonism. In the early stages of the disease, cortico-basal degeneration (CBD) provides little information. As the disease progresses, unilateral degeneration of the light pink hemisphere is observed on neuroimaging examination. In the pathogenesis of the disease, not only the colored substance of the basal ganglia is damaged, but also the white matter, which is part of it. The results of this examination supplement the clinical findings and help distinguish primary parkinsonism from secondary parkinsonism. For example, MRI examinations are used to determine the causes of lacunar strokes in the extrapyramidal nuclei, tumors, pathological conditions such as hydrocephalus and diseases, i.e., parkinsonism.

**Purpose of the Study:** to analyze neuroimaging and neurophysiological parameters in patients with Parkinson's disease.

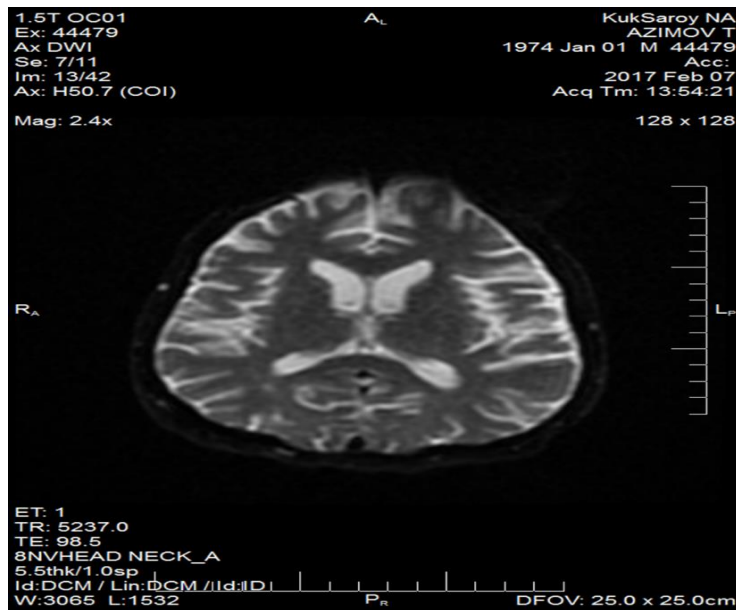
### Material and Applied Research Methods

136 patients (78 men and 58 women, mean age  $64.2 \pm 5.1$  years,  $2.6 \pm 1.1$  Hen-Yar score, duration of disease  $4.2 \pm 1.9$  years, UPDRS score  $47.2 \pm 13.6$ ) were selected. Brain MRI and electroneuromyographic (ENMG) examinations were used as methods of investigation.

### Results of the Examination

Currently, PC is not only a disease of the basal ganglia, but the degenerative process with Levi's corpuscles also spreads to the limbic system, cerebral cortex and leads to the development of profound dementia. According to some scientists, metabolic changes in the cortex and atrophy of the hippocampus can be observed as early stages of the disease. Regarding the analysis of MRI findings in the patient group, the MRI findings were mostly consistent with the literature data, the patients with PC had predominantly basal ganglia lesions. (pic. 1-2).





**Pic 1. Scalp atrophy on MRI analysis**



**Pic 2. Cortical atrophy on MRI scan**

Mild cerebral atrophy was observed in  $60.5 \pm 2.7\%$  of PC patients, flattening of the cerebral gate in  $17.6 \pm 1.14\%$  of PC patients, and moderate periventricular edema in  $49.7 \pm \%$  of patients. Focal cysts were observed in  $8.2\%$  of patients, and it is remarkable that these cysts were mainly located in the pale sphere. Ischemic changes in subcortical nuclei were observed in  $34.8\%$  of patients.

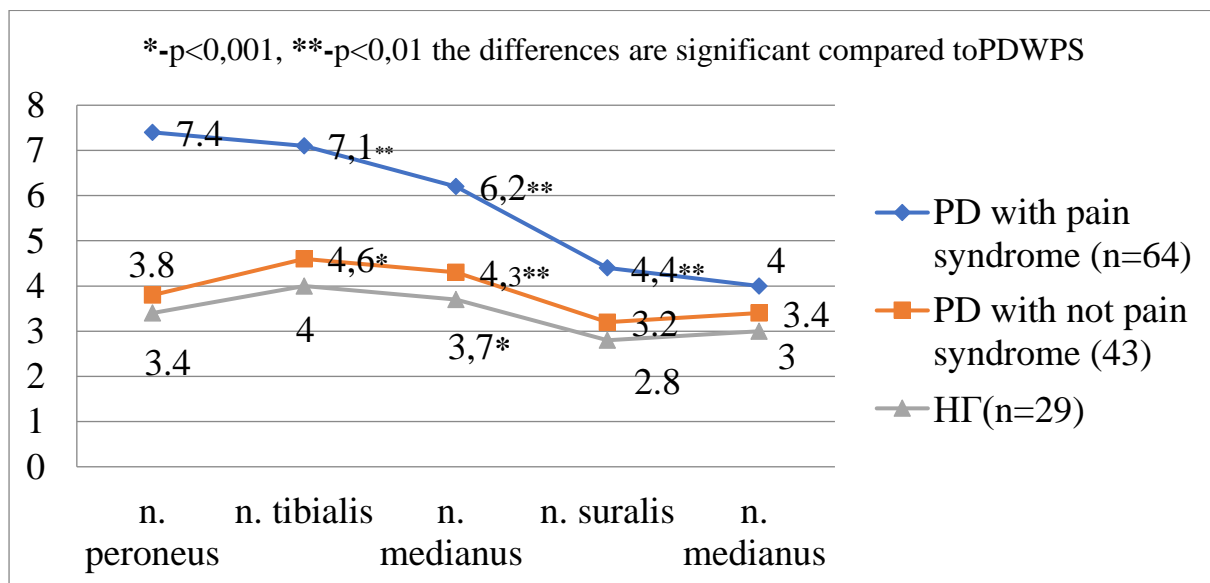


### Results of electroneuromyographic study (ENMG).

ENMG stimulation was performed on motor and sensory nerves: medial, greater tibia, and lesser tibia.

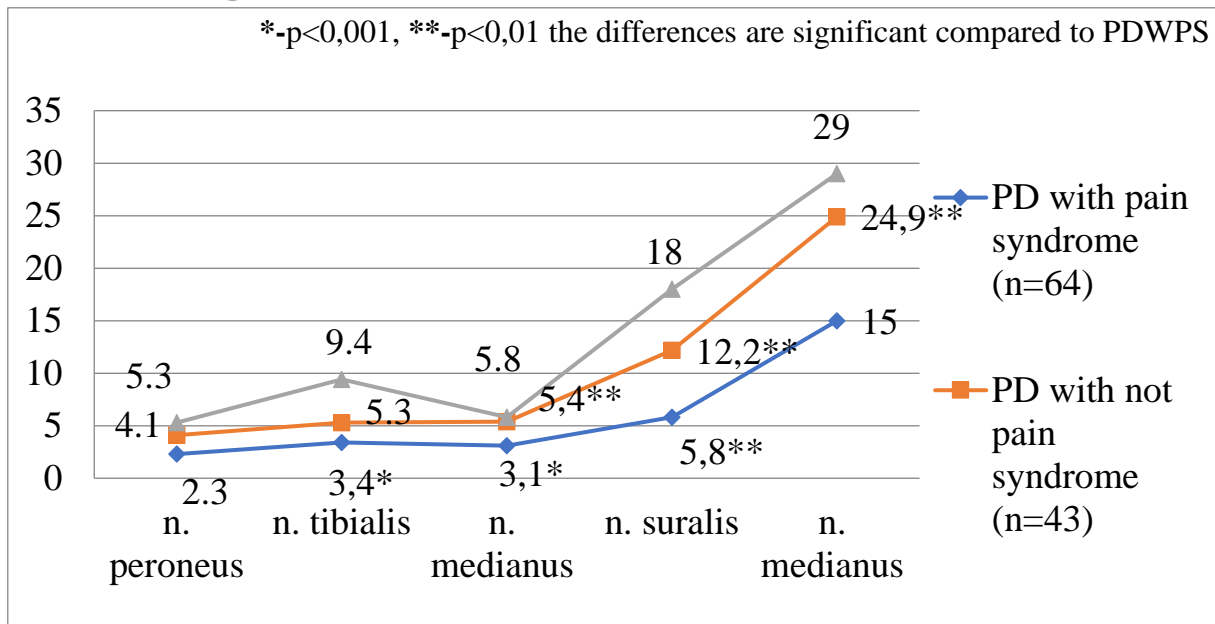
After ENMG, 19 patients showed signs of mixed polyneuropathy (mainly axonopathy) in motor and sensory fibers of median, peroneal, tibial and calf nerves on both sides. 1 point - change of ENMG control values up to 30%, light neuropathy was revealed in 8 patients; 2 points - change of ENMG control values from 30 to 50%, 7 patients with a moderate degree of polyneuropathy; 3 points - change of ENMG more than 50% of control values was revealed in 4 patients with severe neuropathy. The difference of average values of ENMG indices between the 1st and 2nd groups was true ( $p < 0,001$ ). Comparative analysis was carried out in the groups according to the parameters of neurophysiological examination method, latent time, amplitude, impulse transmission rate. The ENMG parameters of the examined groups of patients and healthy people are presented.

Latent time in the groups according to the ENMG parameter we observed a significant increase in latent time in patients with PWS compared to the other groups (Fig. 4).



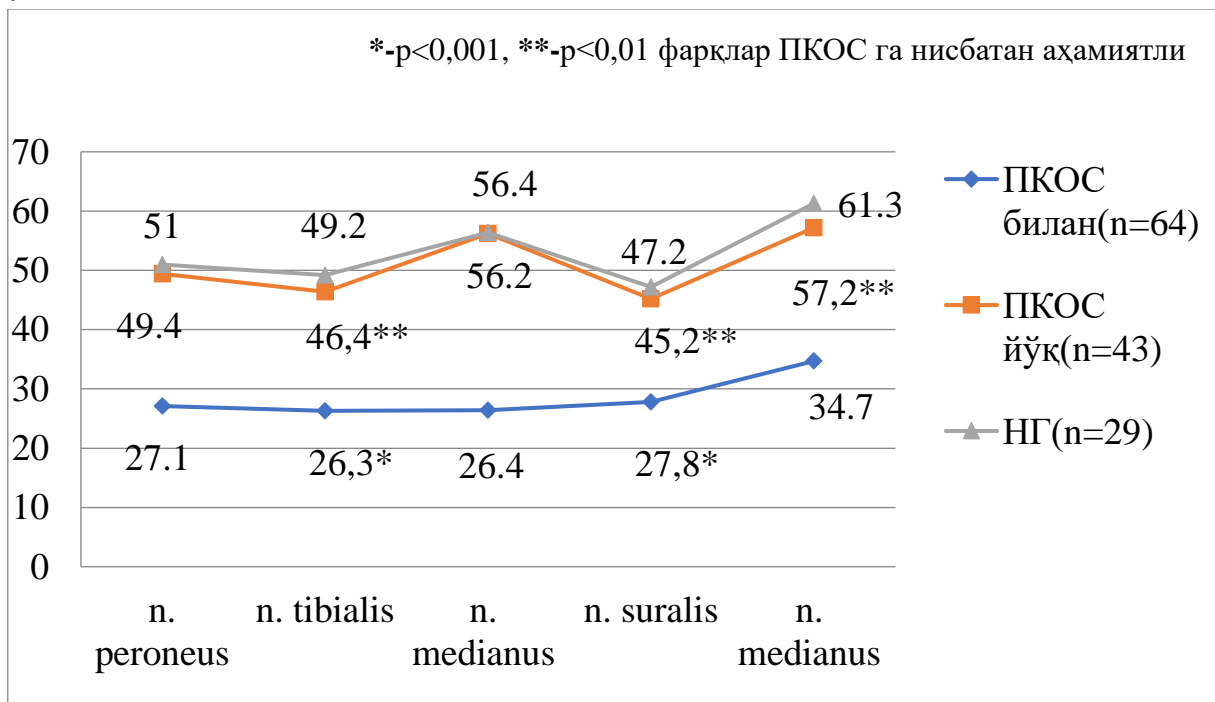
pic. 4. ENMG latency indices in the groups

ENMG results revealed a decrease in the amplitude of the neural M-response and an increase in the latent period, indicating axonopathy and myelinopathy in PC patients with signs of polyneuropathy ( $p < 0.001$ ) (pic. 5).



**pic. 5. ENMG amplitude indices in the groups**

In the group with pain syndrome in PC there was revealed a significant decrease ( $r<0,001$ ) in the rate of impulse conduction along motor and sensitive fibers of peripheral nerves, indicating a decrease in the number of nerve fibers innervating the muscle and providing transmission of afferent impulses from proprioceptors (pic.6).



**pic. 6. ENMG pulse transmission velocity indices in the groups**



## Conclusion

According to the results, Parkinson's disease was diagnosed in 38% of patients with lacunar infarction of the basal ganglia. The neuropathy of mild severity was revealed in 41,1% of patients with changes of the basic ENMG parameters up to 30% of control values; in 36,8% of patients the average level of the basic ENMG parameters varied from 30 to 50% of control values; in 21,1% of patients with severe neuropathy the basic ENMG parameters changed by more than 50% of control values.

## Bibliography:

1. Ollanova S. S., Abdullaeva N. N., Isanova S. T. CLINICAL AND NEUROLOGICAL MANIFESTATIONS OF PAIN SYNDROME OF PARKINSON'S DISEASE //Web of Scientist: International Scientific Research Journal. – 2022. – Т. 3. – №. 3. – С. 687-698.
2. Олланова, Ш., Абдуллаева, Н., & Утаганова, Г. (2022). ПАТОГЕНЕТИЧЕСКИЕ МЕХАНИЗМЫ И КЛИНИЧЕСКИЕ ВАРИАНТЫ БОЛЕВОГО СИНДРОМА ПРИ ПАРКИНСОНИЗМЕ. Журнал вестник врача, 1(1 (98), 144–146. <https://doi.org/10.38095/2181-466X-2021981-143-145>
3. Mamurova M. M. et al. Хронические цереброваскулярные заболевания, обусловленные артериальной гипотензией, у пациентов молодого возраста //Здобутки клінічної і експериментальної медицини. – 2019. – №. 3. – С. 101-105.
4. Олланова, Ш., Абдуллаева, Н., & Утаганова, Г. (2022). ПАТОГЕНЕТИЧЕСКИЕ МЕХАНИЗМЫ И КЛИНИЧЕСКИЕ ВАРИАНТЫ БОЛЕВОГО СИНДРОМА ПРИ ПАРКИНСОНИЗМЕ. Журнал вестник врача, 1(1 (98), 144–146. <https://doi.org/10.38095/2181-466X-2021981-143-145>
5. Олланова Ш., & Джурабекова, А. (2018). Результаты клиничко-неврологического и электронейромиографического обследования больных с сосудистым паркинсонизмом. Журнал проблемы биологии и медицины, (1(99), 85–88. извлечено от [https://inlibrary.uz/index.php/problems\\_biology/article/view/2238](https://inlibrary.uz/index.php/problems_biology/article/view/2238)
6. Эшимова Ш.К., Хакимова С.З., Джурабекова А.Т. Оценка эффективности антитреморных препаратов у больных эссенциальным тремором // Инновационная наука. 2016. №1-3
7. Эшимова, Ш., Джурабекова, А., Олланова, Ш., & Касимов, А. (2018). Динамика клинических проявлений болезни паркинсона на фоне лечения тидомет форте. Журнал проблемы биологии и медицины, (2.1 (101), 142–144.





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8. Олланова Ш., Эшимова, Ш., Мамурова, М., Джурабекова, А., & Абдуллаева, Н. (2016). Частота и течение хронического болевого синдрома у больных с болезнью паркинсона. Журнал проблемы биологии и медицины, (2 (87), 71–74.

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9. Эшимова, Ш., Олланова, Ш., Хакимова, С., & Джурабекова, А. (2016). Оценка двигательных нарушений и темп прогрессирования заболевания у больных с эссенциальным тремором. Журнал проблемы биологии и медицины, (2 (87), 147–150.

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