



FEATURES OF P-300 INDICATORS IN YOUNG PEOPLE WITH POST-COVID SYNDROME

J. A. Nazarova

Center For The Development Of Professional Qualifications Of Medical Workers, Uzbekistan

G.G. Urinova

Andijan State Medical Institute, Uzbekistan

ABSTRACT

This article discusses the features of P-300 indicators in young people with post-COVID syndrome. In a comprehensive clinical examination of patients, the generally accepted clinical examination of the somatic status, laboratory research methods, instrumental research methods (electroencephalography (EEG), cognitive evoked potentials of the brain (CEP) were used.

KEYWORDS: Features of P-300 indicators, post-COVID syndrome, clinical examination, somatic status, laboratory research methods, instrumental research.

INTRODUCTION

After the completion of the acute phase of COVID-19, the subsequent course of the disease and the dynamics of its clinical manifestations differ. Changes in the mental and physical components of health are closely related to each other, while cognitive impairment is largely independent of other manifestations of PCS. It can be assumed that there are differences in the mechanisms of formation of manifestations of PCS, which will ensure the stratification of patients and the implementation of personalized rehabilitation measures (1.4).

Purpose of the study. To analyze the parameters of P-300 in young people with post-COVID syndrome, depending on gender.

MATERIAL AND RESEARCH METHODS

The study included 87 young patients aged 18 to 44 years (mean age 31.9 ± 12.1 years) with post-COVID syndrome (PCS). The patients were divided into two groups: group I consisted of 36 women (41.4%), group II - 51 men (58.6%), the gender index was 1.4:1.0. The control group (CG) included healthy individuals comparable with those of the main group in terms of sex and age characteristics ($n=20$; mean age 32.4 ± 7.3 years; gender index 1.0:1.2).

The diagnosis of post-COVID syndrome was included in the International Classification of Diseases (ICD-10), heading code U09.9 "Post-COVID-19 condition, unspecified", which also includes post-COVID state (5). Patients were observed in the conditions of the neurological and therapeutic departments in the regional hospital of the city of Andijan.

In a comprehensive clinical examination of patients, the generally accepted clinical examination of the somatic status, laboratory research methods, instrumental research methods (electroencephalography (EEG), cognitive evoked potentials of the brain (CEP) were used.

Statistical significance of the results was assessed using Student's test of significance (t) for parametric distribution and Fisher's test (F) for nonparametric data distribution. Differences were considered significant at 95% confidence interval ($P \leq 0.05$).

RESEARCH RESULTS

In addition to clinical and neurological studies, the research program included, in addition to EEG recording, studies of indicators of cognitive evoked potentials (P300) [2,3]. Cognitive evoked potentials (CEPs) allow you to evaluate the phenomena that occur in the brain, which are associated with the recognition and memorization of stimuli that the researcher activates. We carried out neurophysiological studies in patients with PCS. The results of these studies were compared with the indicators of the CG. These data are presented in table 1.

From the table, it can be seen that the STM indicators in patients with postcooid syndrome (PCS) and the control group (CG) had some distinctive features. There were significant differences in the latency of the P300 indicator.

For the rest of the analyzed indicators, the differences were not significant. When comparing the STM values in patients with PCS and controls, we found a noticeable lengthening of the latency values in all leads. The differences in the indicators were significant when comparing the indicators between the CG and groups I and II, the differences in the indicators of the first group and the CG were unreliable.

Table 1
STM indicators in patients with CVI and CG

Method P300	Latency Options (ms)			
	perception	identification	making decisions	RAM
Examined groups	N1	P2	N2	Ampl N2/P3
I group	235,5±1,3	347±2,1	109±1,9	19,8±0,9
II group	242,5±1,3	354±2,2	110,3±2,4	18,1±0,5
CG	233,6±1,6	333,7±2,1	104,8±2,6	20,7±0,8

Thus, the study of cognitive functions in the examined patients revealed the following: the sex of patients with PCS correlated with more pronounced cognitive impairment. Therefore, the



determination of cognitive evoked potentials provides an opportunity to obtain additional information about the cognitive status of patients with PCS.

According to the results of other researchers, vascular dementia occurs more often in males than in females, especially in the age group up to 75 years [1,4]. This regularity, most likely, is also characteristic of the early - pre-dementia forms of vascular cognitive disorders, in particular the syndrome. Distinctive characteristics of CR in patients with PCS of different sexes can be explained by their initial features of the morphofunctional organization of the brain, as a result of which men have better visuospatial abilities compared to women, and women have better speech abilities and verbal memory [1].

When comparing P-300 values in patients with PCS compared with the control group, depending on gender, the following results were obtained. Table 3.12 clearly demonstrates the differences in the main STM indicators for women and men. Thus, there were significant differences in the latency of P300. In men, this indicator was 397.85±63.21 ms, while in women it was 368.75±53.01 ms.

Table 2

Parameters of P300 evoked potentials in examined patients with PCS depending on sex

Options	Leads	I group	II group	CI
Latency P3, ms	C3	368,75±53,01 *^	397,85±63,21 *	351,9±24,3
	C4	367,62±52,63 *^	389,25±61,34 *	341,8±26,3
Amplitude N2/P3, µV	C3	7,50±3,30	7,81±3,29	5,2±3,28
	C4	7,59±3,0	7,6±2,9	5,6±2,91
Latency N2, ms	C3	255,81±34,14	285,91±39,1	268,4±41,7
	C4	251,18±32,67	271,18±22,7	269±47,2
Latency N3, ms	C3	460,40±77,82	465,40±78,27	457,2±54,3
	C4	461,86±79,84	465,68±74,48	451,7±60,3
Amplitude N3/P3, µV	C3	6,98±4,41	6,83±4,18	6,1±6,37
	C4	6,84±3,76	6,84±3,69	8,25±6,89

Note: significant difference * - between CG - men and men;

^ - between CG - women and women.



For the rest of the studied parameters, the differences were not significant. When comparing the indicators in the study of STM in patients with PCS, an increase in latency in all leads was noted (Table 2).

CONCLUSION

Neuropsychological examination and cognitive evoked potentials are important methods for assessing the state of higher mental functions in patients with PCD and allow assessing the degree of involvement of the affected brain regions in the pathological process, as well as the functional state of the brain as a whole. The study showed differences in neuropsychological parameters depending on gender; in the group, men had significantly more pronounced CI and a lower rate of conduction of evoked cognitive potentials in the brain, in contrast to women. Moreover, the indicators on the MMSE scale in the group of women with PKS were also significantly higher than the corresponding indicators of the examined men with PKS. It should be assumed that the presence of post-covid syndrome triggers an early and accelerated process of cerebral ischemia, and males are at risk.

REFERENCES

1. Bachinskaya N.Yu. (2010) Syndrome of moderate cognitive impairment. *NeuroNews*,2(1): 12–17.
2. Gnezditsky V.V., Shamshinova A.M. (2001) Experience in the use of evoked potentials in clinical practice. Antidor, Moscow, 473p.
3. Gordeev S.A. (2007) Application of the method of endogenous event-related brain potentials P 300 to the study of cognitive functions in normal and clinical practice. *Human Physiology*, 2(33): 121–133.
4. Ternovykh I.K., Topuzova M.P., Chaikovskaya A.D. Neurological manifestations and complications in patients with COVID-19. *translational medicine*. 2020; 7(3): 21-29. DOI: 10.18705/2311-4495-2020-7-3-21-29.
5. Emergency use ICD codes for COVID-19 disease outbreak (англ.); Summary of ICD coding for COVID-19 // Статья от 21.01.2021 г. South African WHO-FIC Collaborating Centre.

