METHODS OF PAIN SYNDROME ASSESSMENT USING SCALES AND QUESTIONNAIRES IN PATIENTS WITH TRIGEMINAL NEURALGIA IN THE POSTCOVID PERIOD

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Abstract. *In contrast to the pathogenetic mechanisms of damage to the PNS in acute COVID-19, virus-induced neuroinflammatory, prothrombotic, hypoxic, metabolic and apoptotic cascades play a significant role in the development of the "post-COVID syndrome". A number of studies have shown that abnormal humoral and cellular immune responses, systemic markers of inflammation such as interleukin-1, interleukin-6 and tumor necrosis factor (TNF), autoantibodies targeting cellular receptors may be involved in the systemic and neurological effects of COVID-19. Cranial neuropathy in the covid and post-covid periods can be isolated or occur within the framework of multiple mononeuropathy. Most often, the olfactory (I), trigeminal (V), facial (VII), pharyngeal (IX), optic (II) and vagus (X) nerves are involved.*

Keywords: *trigeminal neuralgia, pain syndrome, VAS scale, pain DETECT questionnaire, McGill questionnaire, Beck depression scale.*

As the data of numerous studies have shown, with COVID-19, any part of the nervous system can be involved in the pathological process. Neurological manifestations are characterized by variability, polysymptomicity and can persist for a long time in the post covid period. Symptoms such as headache, cognitive impairment, "fog" in the head, dizziness, disorientation, psychomotor agitation, impaired consciousness, sleep disorders, anxiety, depression, epileptic seizures are associated with central nervous system damage. This article presents the results of a study of pain syndrome in patients with severe stenosis of the carotid and vertebral arteries (group 1, 50 patients) and patients without stenosis (group 2, 50 patients) using scales and questionnaires. When evaluating the sensory, emotional, and evaluative components of the McGill questionnaire, it was revealed that the pain syndrome in the first group is more pronounced than in the second. A significant correlation was revealed between the results on the Beck depression (BDI) scale and visual analog scale, VAS, which shows that patients of older age groups with stenosis significantly experience pain syndrome more strongly.

The problem of trigeminal neuralgia (HTN) is one of the unsolved problems of modern neurology [1, 2, 6]. It is well known that HTN is characterized by severe paroxysmal pain paroxysms, usually unilateral, more often in the zone of the second and third branches and very rarely the first branch. Pain occurs spontaneously or as a result of irritation of trigger zones by non-painful irritants of the skin or mucous membrane of the oral cavity, teeth or tongue. The attack lasts from a few seconds to several minutes, repeating at short intervals. The course of the disease is remitting, and the duration of remissions decreases with age. Such a clinical picture is described in the literature as idiopathic, typical, true, classical, essential, cryptogenic HTN [3, 7, 9, 10]. Quantification of pain is an important and difficult clinical problem, relevant both for scientific research and for practical healthcare [4, 5]. To determine the intensity of pain syndrome in patients with trigeminal neuralgia, the VAS scale (visual analog scale) and a short McGill questionnaire

are used. To assess the severity of pain syndrome in patients with NTN, the following scales are most often used in clinical practice: the verbal descriptive pain assessment scale (Verbal Descriptor Scale), the modified facial pain scale (Faces Pain Scale), as well as the visual analog scale (Visual Analogue Scale) [8].

The purpose of the study. The study of methods for assessing pain syndrome using scales and questionnaires in patients with NTN in the post covid period.

Materials and methods of research. The study involved 50 patients with severe stenosis of the carotid and vertebral arteries, 50 patients without stenosis who had a history of coronavirus infection. A visual analog scale (VAS), the pain DETECT questionnaire and the McGill pain questionnaire were used to study and evaluate the pain syndrome, as well as for catamnestic examination.

A diagnostic neuropathic pain questionnaire (DN4) has been developed in France, intended for widespread use by practitioners (Didier Bouhassiraa, Nadine Attalaetal., 2005). It consists of two blocks: the first – of seven questions – is filled out based on the patient's survey, the second – of three questions – based on a clinical examination. The first block allows you to evaluate positive sensory symptoms, such as spontaneous pain (burning sensation; painful sensation of cold; feeling like electric shocks), paresthesia, dysesthesia (crawling sensation, tingling, numbness, itching). The second block allows the doctor to identify gallodynia and negative sensory symptoms. The calculation of the questionnaire points is very simple: the sum of points above 4 means that the patient is presumed to have neuropathic pain. The validity of the DN4 questionnaire has been confirmed by a corresponding study. It correctly identifies neuropathic pain in 86% of patients, and also has a high level of sensitivity (82.9%) and specificity (89.9%).

Visual analog scale (YOURS). This method of subjective pain assessment consists in asking the patient to mark a point on an ungraded 10 cm long line that corresponds to the severity of the pain.

The Pain Detect questionnaire was developed and validated in Germany during a multicenter study involving 392 patients with neuropathic and nociceptive pain, as well as back pain (Freynhagen, 2005, 2006). The questionnaire is designed to be filled out by a doctor and combines a pain disorder distribution scheme in the form of a picture with a VAS scale and a questionnaire aimed at identifying spontaneous and induced symptoms of neuropathic pain. Also, with the help of a drawing, the nature of the course of pain is assessed: constant, paroxysmal, constant with seizures, etc. The questionnaire most fully reflects all possible parameters of the pain and allows you to very clearly track the picture of the pain syndrome in dynamics. The McGill Pain Questionnaire (OBM) suggests that pain is determined by many factors. It includes sensory, emotional, and evaluative aspects. The OBM includes a digital scale of pain intensity, a set of descriptor words and a description of pain [11]. The Mc Gill Pain Questionnaire (MPQ) provides a qualitative description of pain. The questionnaire sheet consists of 78 pain descriptors, distributed into 20 subclasses, which reflect 3 main pain aspects (sensory, emotional and evaluative) and 1 mixed factor. All factors and subclasses are ranked according to a point system reflecting increased pain intensity. Each subclass contains from 2 to 5 descriptors describing the level of pain intensity in this subclass. The final value of the ORB (Pain Rating Index, PRI) is derived based on the summation of all selected descriptors from all 20 subclasses and varies from 0 to 78. The totals can also be calculated for each factor by adding the values of the descriptors corresponding to the subclass factor.

The test includes and describes the following scales:

SPR - sensory (1st-10th subclasses) Pain is characterized in terms of mechanical or thermal effects, changes in spatial or temporal parameters.

APR - emotional (11th-15th subclasses) reflects the emotional side of pain in terms of tension, fear, anger, or vegetative manifestations.

EPR is an estimated (16th subclass) expressing a subjective assessment of the intensity of pain by the patient.

MPR is a mixed (17th-20th subclass)

PR - rank pain index (total the amount)

NIB is a real feeling of pain intensity

PTS - The total number of selected words (description of pain)

The Beck Depression Inventory was proposed by A. T. Beck and his colleagues in 1961 [12] and developed on the basis of the authors' clinical observations, which made it possible to identify a limited set of the most relevant and significant symptoms of depression and the most common complaints made by patients. After correlating this list of parameters with the clinical descriptions of depression contained in the relevant literature, a questionnaire was developed that includes 21 categories of symptoms and complaints. Each category consists of 4-5 statements corresponding to specific manifestations/symptoms of depression. These statements are ranked as the specific contribution of the symptom to the overall severity of depression increases.

The test results are interpreted as follows:

• 0-13 — variations considered the norm
• 14-19 — mild depression
• 20-28 — moderate depression
• 29-63 — severe depression

Statistical data processing was performed using the statistical software package Statistical Package for Social Science (SPSS) 23.0 for Windows. The following indicators were used to represent the data: the average value, the standard error of the average, the standard deviation and percentages. For paired comparisons of nonparametric characteristics, a t-test with a two-sided 5% ($p < 0.05$) significance level was used. A comparison of the average values of the frequency of seizures in different age groups revealed a statistically significant ($p < 0.05$) lower frequency of seizures in the second group compared with patients from the first group of older age.

Results and discussion. The results of the studied groups according to scales and questionnaires are presented in Table 1.

Table 1

Indicators of the study groups according to scales and questionnaires.

Questionnaires and scales	group 1	group 2	The significance of the differences (p)
Questionnaire DN4	7±1,21	5,46±1,23	>0,05
VAS (verbal assessment scale)	2,98±0,62	2,46±0,61	<0,05
VAS (facial pain assessment scale)	7,6±1,89	5,84±1,8	<0,05

Pain DETECT Pain Questionnaire	24,14±3,54	21,68±4,72	<0,05
Beck depression scale	37,82±11,36	22,7±15,26	<0,05

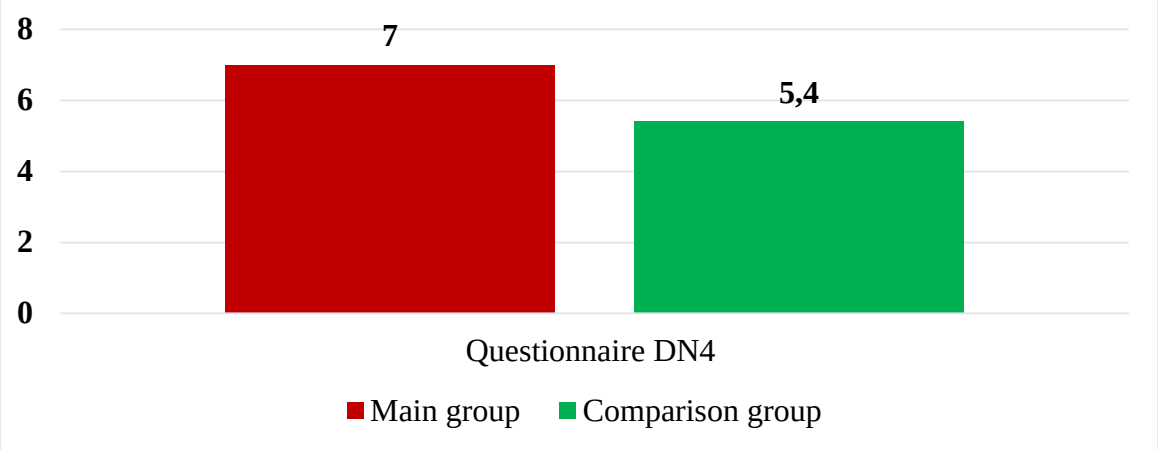

Fig. 1. The results of the indicators according to the DN4 questionnaire

As can be seen from Fig. 1, according to the questionnaire, DN4 in the main group of subjects was 7 ± 1.21 and in the comparison group 5.4 ± 1.23 points. The score indicated the presence of neuropathic pain. There were no significant differences between patients of different groups. The results of the compared groups on the verbal assessment scale are presented in Table 2.

Table 2

VAS (Verbal Assessment Scale)

Indicator	Main group (n=50)		Comparison group (n=50)	
	Number b-x	%	Number b-x	%
1-mild pain	-	-	1	2
2-moderate pain	10	20	27	54
3-severe pain	31	62	20	40
4-the most severe pain	9	18	2	4
Total	50	100	50	100

Table 3 shows the results of the observation groups on the mimic pain assessment scale.

Table 3

VAS (Facial Pain Assessment Scale)

Scores	Main Group (n=50)		Comparison group (n=50)	
	Number b-x	%	Number b-x	%
4	7	14	20	40
6	7	14	16	32
8	25	50	12	24
10	11	22	2	4
Total	50	100	50	100

The results of the Pain Detect pain questionnaire are shown in Table 4.

Table 4

Pain Detect Questionnaire

Points	Main group (n=50)		Comparison group (n=50)	
	Number b-x	%	Number b-x	%
13-18	6	12	12	24
≥ 19	44	88	38	76
Total	50	100	50	100

According to the multidimensional pain assessment (McGill questionnaire), all patients of both groups had sensory and affective disorders equally (according to the number of selected descriptors), with their significant severity.

The results of the values for both groups of SPR, APR, EPR, MPR and PRI are presented in Tables 5. The average value of the sensory component in the first group was 12.02±2.61, and in the second 10.8±2.17 points. The average value of the emotional component in the first group was 11.32±2.35, and 10.5±2.15 points in the second group. The average value for the mixed component in the first group was 7.86±1.94, and in the second 7.24±1.79 points. The rank index of pain in the first group was 33.56±7.07 points, and in the second 30.32±5.9 points.

Table 5

The value of the indicators according to the McGill questionnaire

Questionnaire scale	group 1	group 2	Significance of differences (p)
SPR	12,02±2,61	10,8±2,17	<0,05
APR	11,32±2,35	10,5±2,15	<0,05
EPR	2,54±0,95	2,32±0,71	<0,05
MPR	7,86±1,94	7,24±1,79	<0,05
PRI	33,56±7,07	30,32±5,9	<0,05
IHD	2,64±1,08	2,48±0,73	<0,05

Table 6 shows the results of a survey of patients in the study groups on the Beck depression scale. In the main group, 3 patients (6%) with mild depression scored from 10-15 points, and in the comparison group 26 patients (52%). Moderate depression was observed in 12 patients (24%) who scored from 16-19 points, and in the comparison group 16 (32%). Severe depression was noted in 35 (70%) patients of the main group and in 8 (16%) in the comparison group.

Table 6

Beck's Depression Scale

The scale of the questionnaire	Main group (n=50)		Comparison group (n=50)	
	Number b-x	%	Number b-x	%
Mild depression	3	6	26	52
Moderate depression	12	24	16	32
Severe depression	35	70	8	16
Total	50	100	50	100

Table 7 shows the correlation between the Beck depression scale and VAS in the observation groups.

Table 7

Correlation relations between the Beck depression scale and VAS

			Beck depression scale	VAS (mimic pain assessment scale)
Ro Spirman	Depression scale Beck	Correlation coefficient	1,000	0,738**
		Significant. (double-sided)	.	0,000
		N	100	100
	VAS (mimic pain assessment scale)	Correlation coefficient	0,738**	1,000
		Values. (double-sided)	0,000	.
		N	100	100

**. Correlation is significant at 0.01 (two-way)

As can be seen from Table 7, when analyzing the data obtained, we revealed a significant correlation between the results of the data obtained from the general population of the examined patients (n-100) according to the Beck depression scale and the VAS scale proposed by him. That is, we have identified a close relationship between the Beck depression scale and VAS, which is used to assess the intensity of chronic pain syndrome (Rs= 0.738((p<0.001)).

Conclusions.

1. Patients of different ages react differently to pain syndrome. We have proved on the basis of the data obtained that the intensity of pain syndrome can be judged by the Beck and VAS depression scale. The Beck depression scale and VAS used in our study do not reflect an objective picture of acute pain syndrome, especially in the comparison group. However, patients of older age groups, with concomitant diseases, and with stenosis of the vertebral arteries significantly experience pain syndrome more strongly.

2. Since the average values of SPR, APR, EPR, MPR and PRI in patients of the first group were higher than in the second group of patients, and had a direct effect on the severity of pain syndrome in patients with carotid and vertebral artery stenosis.

3. We have identified a correlation between the data obtained on the Beck depression scale and VAS in the examined population of patients with pain syndrome, which allows us to use these two methods separately in these patients.

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