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## **OBSERVATION OF VEGETATIVE DISORDERS IN PATIENTS WITH CHRONIC TENSION HEADACHE AND MIGRAINE**

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**Abstract:** The article covers the effects of chronic tension headaches and migraines, which is one of the most urgent issues in neurology today. The Kerdo index and the Hildebrant factor were used to examine the dynamics of vegetative illnesses, and the findings of the examination were given.

**Keywords:** chronic tension headache, migraine, kerdo index, Hildebrant factor, sympathicotonia, normotonia, parasympathicotonia.

### **Introduction**

The most frequent type of headache is chronic tension headache (CTH), however it is less well understood by professionals than migraine [3-5]. This is because the majority of CTH sufferers never see a doctor and instead rely on over-the-counter analgesics. The CTH, on the other hand, is a huge medical and societal issue. Despite the fact that there has been relatively little scientific research on the mechanisms and treatment of headache, it is feasible to successfully treat such individuals, despite the fact that no significant advances in novel medicines have been produced in recent years [10]. Since the original classification, the diagnostic criteria for CTH have remained unchanged. The only difference is that the CTH is now divided into three groups, each with a different frequency of the CTH. The first classification proposed the episodic and chronic divisions, which were retained unmodified. Chronic kind is a “severe” disease that causes a significant drop in quality of life, a significant percentage of impairment, and large socioeconomic costs. Patients with uncommon or frequent bouts of hypertension had different disability and pathophysiological aspects in the episodic subgroup. In the second classification, it was decided to separate.

Episodic tension headaches occur once a month or more frequently, up to 15 times a month in rare instances. A rare type of tension headache has essentially no effect on a person and requires medical attention only in the most extreme cases. People who suffer from recurrent headaches are severely disabled, necessitating the use of costly drugs and preventative treatment [9]. Patients were classified into two groups in the first classification: those with and those without pericranial muscular tension.

This classification has been kept in the second edition of the International Headache Classification because sensitivity is the most important distinguishing trait in manual palpation [4,7]. Manual palpation or an algometer can easily detect pericranial muscle tension. Pterygoid, lumbar, trapezius, frontal, temporal, masticatory, and sternocleidomastoid muscles were studied [5]. The clinical signs and pathophysiological abnormalities in response to treatment are comparable, but the frequent and chronic CTH and severe stress in different therapies raises the question of episodic vs chronic division [6].

The differential diagnosis of CTH is complicated by access to the second categorization of chronic migraine. A persistent migraine or headache that fits the CTH criteria for at least 15 days per month is required for both diagnosis. A patient could theoretically have both diagnoses.

Many patients with CTH have drug addiction; the diagnosis should be made using the criteria for drug overuse [7,9], and the occurrence of headache in the patient should be ruled out.

CTH usually proceeds from an episodic to a chronic stage in most patients; however, if the headache becomes chronic within three days, it is characterized as a new daily persistent headache. The annual prevalence of episodic tension headache was 63 percent in the most extensive epidemiological investigation yet undertaken in Denmark [11]. (56 percent in men and 61 percent in women). CTH was found in 3% of people (2 percent in men and 5 percent in women). With a male to female ratio of 4 to 5, gender differences were statistically significant.

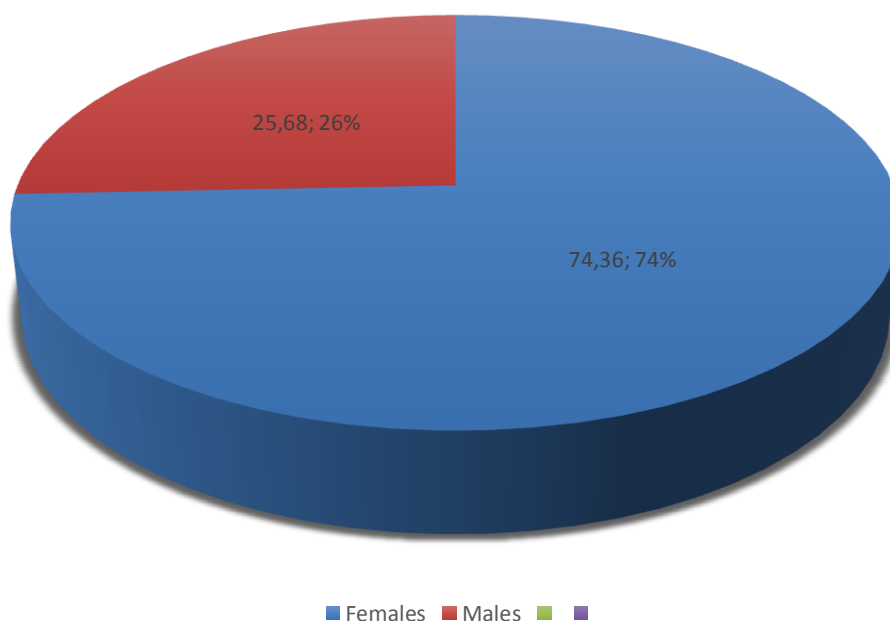
With age, the prevalence of CTH diminishes. CTH was found to be present in 4.1 percent of people in the United States. The prevalence of CTH was reported to be 2% in a survey of 2,500 university students in the United States [13].

CTH has a substantially bigger socioeconomic impact than other types of headaches due to its high prevalence [9]. To yet, it is unclear whether headaches are caused by a central or peripheral mechanism [8, 9].

Materials and methods

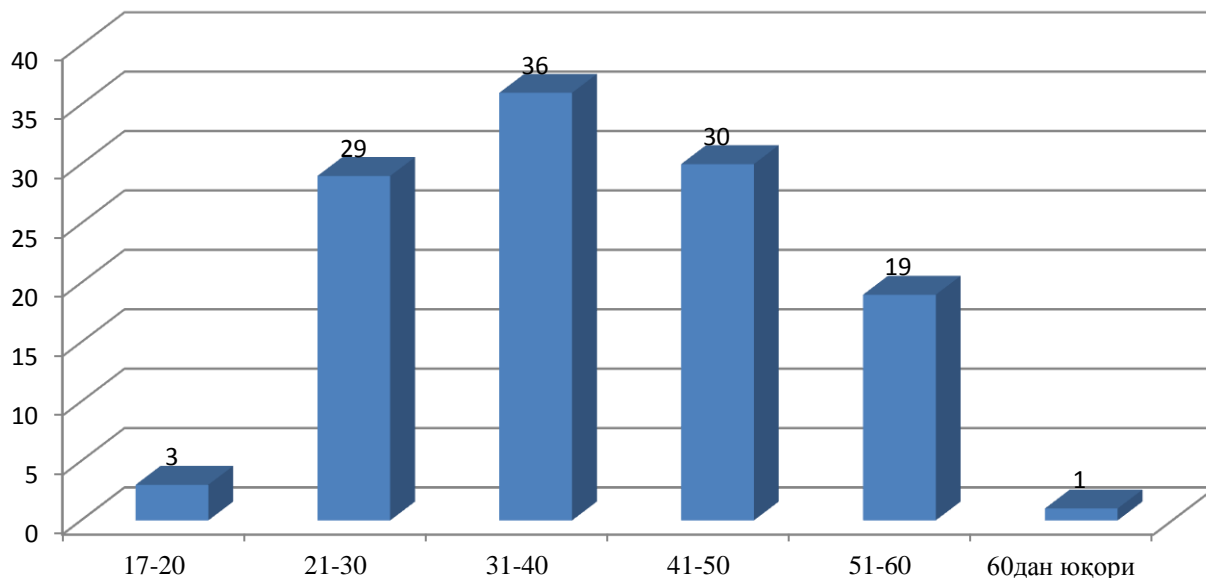
#### General characteristics of clinical material

117 patients, age 17-61 (average age  $38.5 \pm 10.36$ ) were selected for the clinical part of the study. Of these, 30 (25.64%) were males and 87 (74.36%) were females (Figure 1).



**Figure 1**  
Distribution of patients by sex

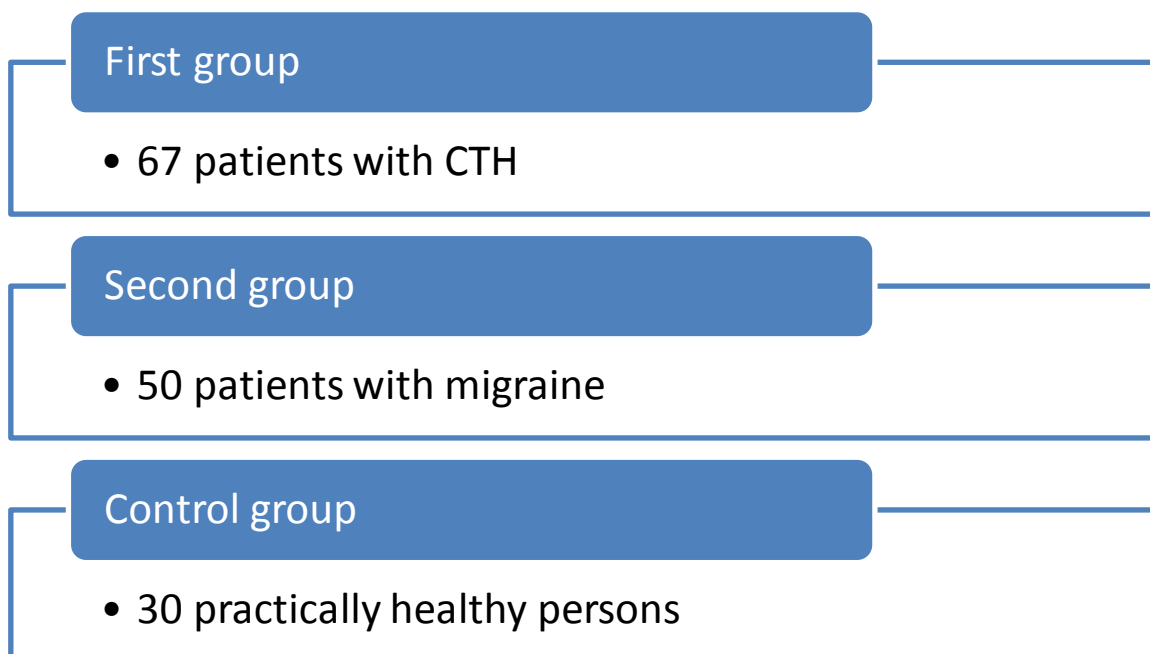
By age of patients: 13-20 years - 2, 21-30 years - 9, 31-40 years - 36, 41-50 years - 30, 51-60 years - 19 and over 60 - 1 patient. The specificity of the distribution of patients by age is predominant among women in all age groups (Figure 2).



**Figure 2**  
**Distribution of patients by age**

All patients complained of tension-induced headache b (G44.2 according to XKT (ICT) -10).

Patients were studied in two groups, the first group consisted of 67 patients with chronic tension headache, the second group consisted of 50 patients with migraine, and the third group consisted of 30 practically healthy patients.



In the study, patients were selected according to the following parameters (Table 1).

**Table 1**

### Criteria for diagnosing the patients

	Diagnosis criteria
<b>Migraine</b>	<p>The diagnosis of migraine patients was made on the basis of the following symptoms: Severe, paroxysmal headache, nausea, photophobia, phonophobia. No focal neurological changes in neurostatus. Neurovisual examination revealed MRI, ICLS, MRI angiography, angiography and cerebral vascular ultrasound examination, no pathological changes.</p>
<b>CTH</b>	<p>The patient has been complaining of tension headache and no changes in neurostatus, neurovisuolization examination are detected. The duration of the headache is not less than 30 minutes, in episodic tension headaches from 30 minutes to 7 days, in chronic tension headaches the headache does not stop every day. The nature of the headache - squeezing, crushing, pressing, monotonous. Not observed in the loose character. Localization of headache - diffuse, bilateral. Headaches do not increase with daily physical activity.</p>

All patients underwent a clinical neurological examination, after which the autonomic nervous system Kerdo index and Hildenbrant coefficient were determined.

The results were statistically processed using the computer programs SPSS (22.0). The absolute and relative number of patients, the mean value, and the standard deviations are the statistical indicators given for the amount of data reviewed. When comparing patient groups, the following non-parametric criteria are used: The Wilcoxon criterion was used to compare two interrelated characters, the Friedman criterion was used to compare three or more unrelated characters, the Manna-Whitney criterion was used to compare two unrelated characters, and the Kraskell-Woless criteria were used to compare three or more unrelated characters. The result was a statistically significant  $r < 0.05$ .

#### The Results:

Despite advances in medicine, the biology of migraine remains a mystery to this day. Vasoconstriction due to decreased vascular tone of the cerebral arteries, on the other hand, is thought to play a crucial part in the pathophysiology of migraine onset. There are no data on histological changes in the cerebral arteries and surrounding tissues in migraine patients who have undergone biopsy to support this notion. These histological and electro-microscopic studies, in particular, show no signs of vasculitis or active inflammatory processes [5,3,16]. Excessive sympathetic nervous system activation might cause vascular tone regulation problems in migraine sufferers. The existence of pheochromocytoma may play a role in the development of this illness, and hyperactivity of the sympathetic nervous system can be treated with sympathomimetics for blood pressure fluctuations associated with migraine.

Examinations of the autonomic nervous system are used to determine the tone of the sympathetic and parasympathetic nervous systems based on the above data.

**The Kerdo index** is an indicator used to evaluate VNS performance. Calculated according to the following formula:

$$\left(1 - \frac{DAB}{YQS}\right) \times 100,$$

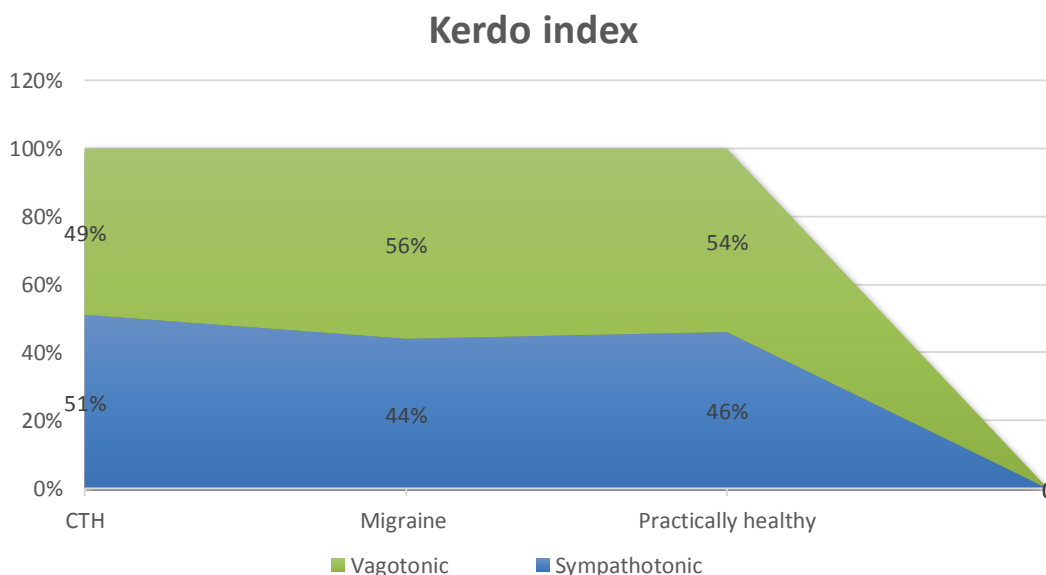
Here, DAB is the diastolic blood pressure (mm sm), YQS is the number of heartbeats per minute.

Interpretation of the Kerdo index: if the value is higher than 0, it is considered sympathotonia, if it is less than 0, it is considered vagotonia.

Table 2. Calculation by Kerdo method, distribution of patients depending on the indicators of vegetative tone.

Kerdo index	migraine (n=50)	CTH (n=67)	Practically healthy (n=30)	Chi-square
Sympathotonic	21	34	14	$\chi^2=4,5$ p<0,05
Vagotonic	29	33	16	

Figure 3



Kerdo index results showed that in our CTH patients 34 patients (51%) were sympathetic, 33 patients (49%), 56% of patients with migraine were sympathetic, 44% were vagotonic (Figure 3). The sympathetic nerve tone of the patients increased ( $\chi^2 = 4.5$  r <0.05) (table 3).



**The Hildenbrandt coefficient** is an indicator used to estimate the superiority of the sympathetic or parasympathetic part of the VNS and is calculated by the following formula:

$$K = YQS / NS$$

Normally,  $K = 2.8-4.9$ .

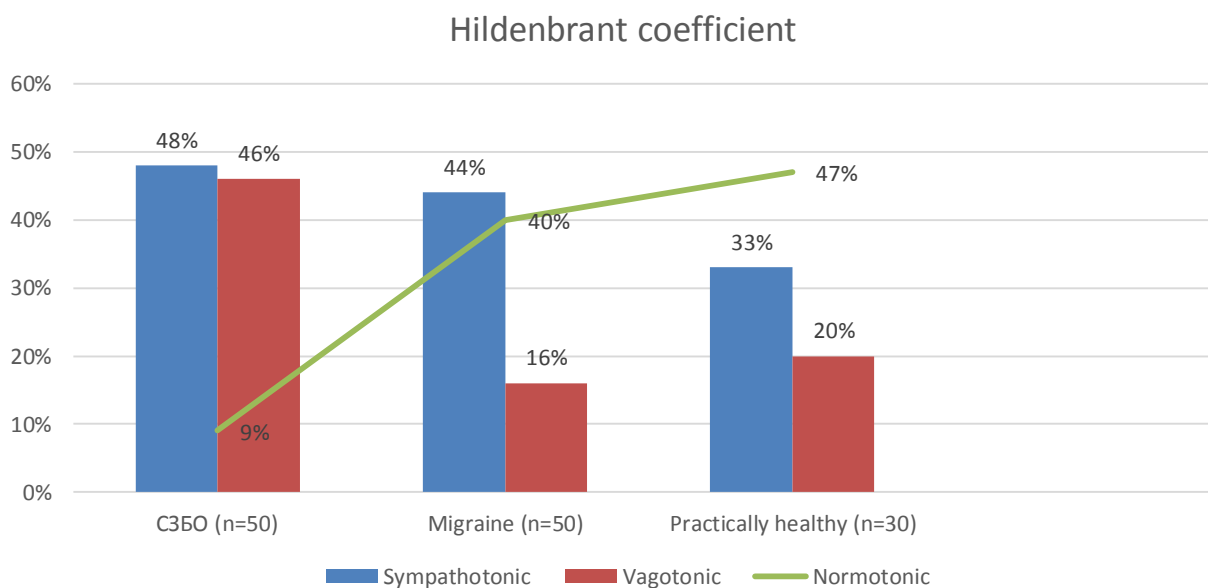
$K > 4.9$  - sympathicotonic

$K < 2.8$  - vagotonic.

**Table 4.** Distribution of patients depending on the indicator of vegetative tone, calculated by the Hildenbrandt method.

	Migraine (n=50)	CTH (n=67)	III group (n=30)	Chi-square
Sympathotonic	22	32	10	$\chi^2=3,17$ $p>0,05$
Vagotonic	8	31	6	
Normotonic	20	6	14	

Figure 4



The analysis of the indicators of the Hildenbrandt coefficient in patients and practically healthy people revealed that the sympathetic nervous system predominates in 48% of patients with CTH. In addition, an increase in sympathetic tone was found in 44% of patients with migraine ( $\chi^2 = 3.17$   $r > 0.05$ ). In this case, the predominance of sympathetic tone over parasympathetic tone is confirmed by the pathophysiological effects of the sympathetic nervous system on the development of vasoconstriction in migraine and CTH (Figure 4).

### Conclusion

When the Kerdo index data were analyzed, 34 patients (51%) of CTH patients were classified as sympathetic, 33 patients (49%) as vagotonic, 56 percent of migraine patients were sympathetic, 44 percent were vagotonic, and patients exhibited an



increase in sympathetic nerve tone ( $\chi^2 = 4.5$  r 0.05). Patients in groups II and III were found to have a vagotonic column. CTH patients were found to have sympathetic nervous system predominance in 48 percent of instances, and sympathetic tone was found to be raised in 44 percent of migraine patients ( $\chi^2 = 3.17$  r > 0.05) when Hildenbrant coefficients were analyzed in patients and virtually healthy people. The pathophysiological effects of the sympathetic nervous system on the development of vasoconstriction in migraine and CTH are confirmed by the predominance of sympathetic tone over parasympathetic tone in this condition. In such circumstances, the sympathetic nervous system's dominance over the parasympathetic nervous system validates the sympathetic nervous system's pathophysiological effects on the development of vasoconstriction in the development of CTH and migraine. Vasoconstriction is the key pathophysiological mechanism in the development of CTH and migraine, and it is caused by a lack of control of cerebral artery tone. In light of the foregoing, it's critical to assess the tone of the sympathetic and parasympathetic nervous systems during an autonomic nervous system evaluation.

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