

# Tension-type headache and arterial hypertension (from the patient's point of view)

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## ABSTRACT

**Introduction.** Tension-type headache translates in the Romanian language as "cefalee de tip tensional" or "cefalee tensională". This may create confusion, since the Romanian term "tensiune" (in English: "tension") is frequently used in the general population to denote high blood pressure (i.e., arterial hypertension).

**Objectives.** To assess the perception of patients and caregivers regarding the potential relationship between the term "tension-type headache" and high blood pressure.

**Material and methods.** We developed a short questionnaire, which was distributed online in the Romanian language to a total of 60 patients or caregivers who agreed to participate.

**Results.** Mean age of the participants was 50±12 years-old (range: 25-81 years-old). There were 75% females (n=45). The majority of the participants (55%) had a high-school degree, while 43% had a Bachelor's degree. 68% of the participants have not heard of tension-type headache before. Slightly more than half of the participants (55%) believed that tension-type headache is related to arterial hypertension. And 80% admitted they would ask the doctor about their blood pressure level, if they were to receive this diagnosis. Participants who would not ask about their blood pressure level were overall younger (43±12 years-old) than those who would (52±12 years-old) (p=0.04).

**Conclusions.** Some people may erroneously believe that tension-type headache relates to arterial hypertension, and many would ask the physician about their blood pressure level. If the patient understands that there is no connection between blood pressure and tension-type headache, then treatment adherence might improve.

**Keywords:** tension-type headache, arterial hypertension, high blood pressure

## List of abbreviations (in alphabetical order):

ACE – Angiotensin-Converting-Enzyme  
HBP – High Blood Pressure  
ICD – International Classification of Diseases

ICHD – International Classification of Headache Disorders  
TTH – Tension-Type Headache

## INTRODUCTION

Tension-type headache (TTH) is one of the most common types of headaches encountered in clinical practice. Its current diagnosis is based on the 3rd Edition of the International Classification of Headache Disorders (ICHD), which differentiates between two forms of tension-type headache (episodic and chronic) [1]. The term "tension-type" was chosen due to its

uncertain pathogenesis and because it was believed that mental or muscular tension might play a causative role [2]. Tension-type headache translates in Romanian as "cefalee de tip tensional" or "cefalee tensională". Moreover, in the Romanian translation of the 10th Edition of the International Classification of Diseases (ICD-10), the term can be found as "cefalee de tensiune" (which in English would be "tension headache") [3,4].

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This may create confusion, since the Romanian term “tensiune” (in English: “tension”) is frequently used in the general population to denote high blood pressure (i.e., arterial hypertension). We have encountered some patients who would ask if the diagnosis given to them (i.e., “cefalee de tensiune”) actually refers to arterial hypertension as the underlying cause of the headache. And there are many patients who believe that their blood pressure is raised whenever they have a headache.

## OBJECTIVES

To assess the perception of patients and caregivers regarding the potential relationship between the term “tension-type headache” and high blood pressure.

## MATERIAL AND METHODS

We developed a short questionnaire, which consisted of the following three questions:

- 1) Have you heard of tension-type headache before?
- 2) If you were to receive a diagnosis of tension-type headache, would you think it is related to arterial hypertension?
- 3) If you were to receive a diagnosis of tension-type headache, would you ask the doctor if you have high blood pressure?

Notice that we chose to use the term “tension-type headache” (translated in Romanian as “cefalee de tip tensional”), since this is the original scientific term of the condition.

The questionnaire was distributed online in Romanian to a total of 60 patients or caregivers who agreed to participate.

We enrolled only adult persons (18 years-old or above) without any prior medical education. Additionally, patients with significant neurologic or psychiatric disorders (e.g., dementia or stroke) that could affect cognition or the quality of the responses were excluded (Table 1). Other relevant information regarding age, gender and educational level were also collected.

Microsoft Excel 2021 was used to create the patient database. Statistical analysis was performed on MedCalc Statistical Software version 22.014.

## RESULTS

Mean age of the participants was 50±12 years-old (range: 25-81 years-old). There were 75% females (n=45). The majority of the participants (55%) had a high-school degree, while 43% had a Bachelor’s degree.

**TABLE 1.** Inclusion and exclusion criteria for our study

Inclusion criteria	Exclusion criteria
Age ≥ 18 years-old	Physicians or other medical personnel
Patients or caregivers	Significant neurologic or psychiatric disorders (e.g., stroke or dementia)
Ability to read and to provide a written or oral response	

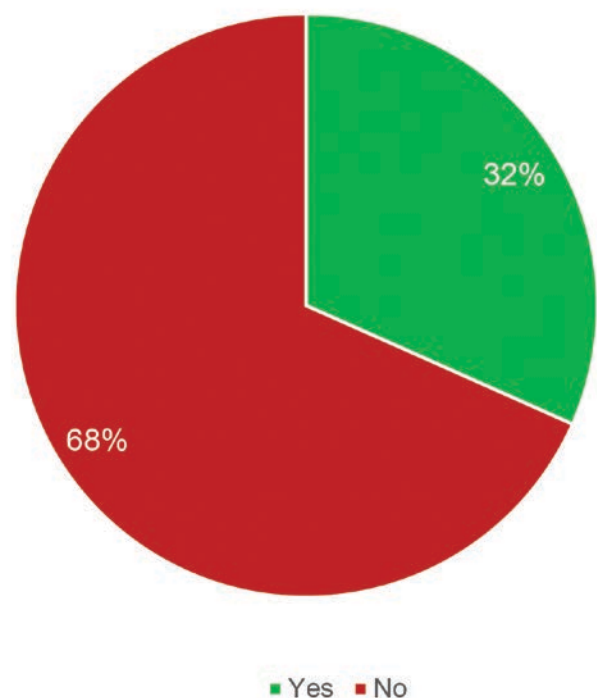
There was no age difference between males (53±15 years-old) and females (49±11 years-old) (p=0.3), nor was there an age difference between participants with a Bachelor’s degree (48±13 years-old) and participants with a high-school degree (52±12 years-old) (p=0.2).

Regarding the answer to the first question, 68% of the participants have not heard about tension-type headache before (Figure 1).

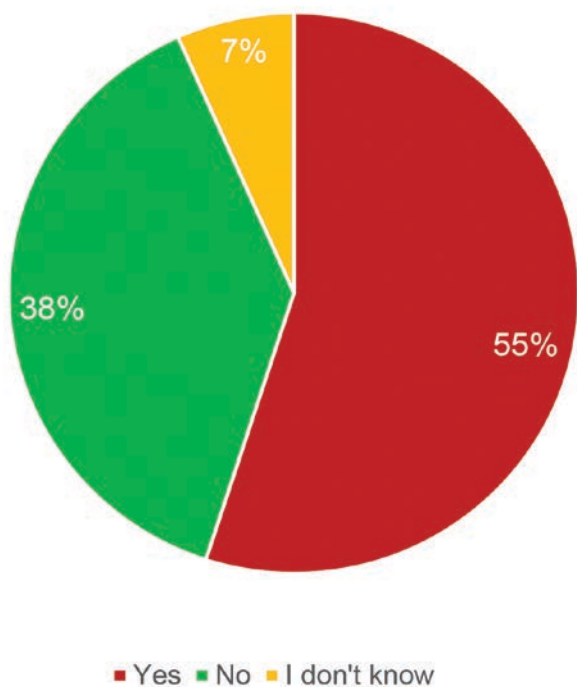
Moving to the second question, slightly more than half of the participants (55%) believed that tension-type headache is related to arterial hypertension (Figure 2).

And as for the third question, 80% of the participants admitted they would ask the doctor about their blood pressure level, if they were to receive this diagnosis (Figure 3).

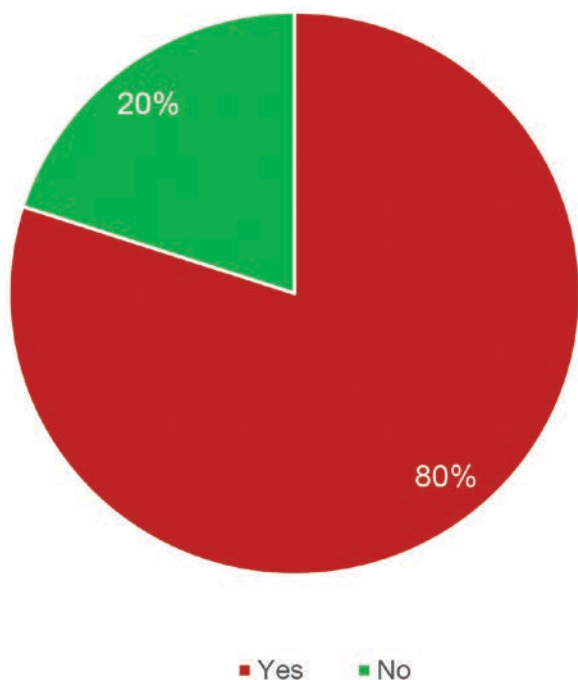
It is worth mentioning that most of the patients who have heard about tension-type headache before (i.e., who answered “Yes” to the first question), also answered “Yes” (erroneously) to the second and third questions (79% and 84% of them, respectively).



**FIGURE 1.** Question 1: Have you heard of tension-type headache before?

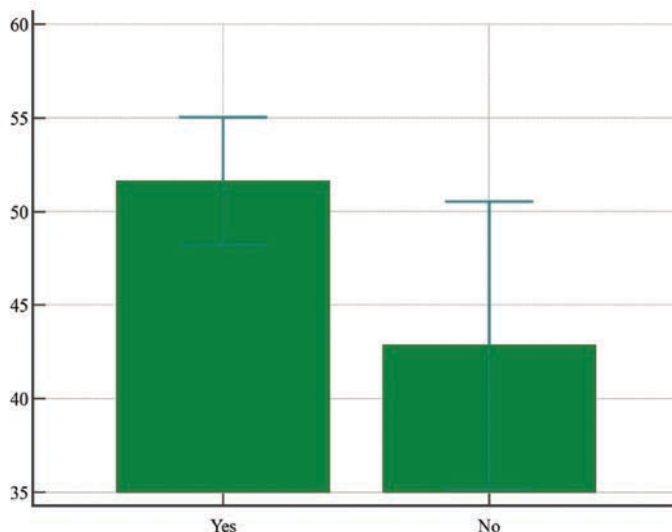


**FIGURE 2.** Question 2: If you were to receive a diagnosis of tension-type headache, would you think it is related to arterial hypertension?



**FIGURE 3.** Question 3: If you were to receive a diagnosis of tension-type headache, would you ask the doctor if you have high blood pressure?

Participants who would not ask about their blood pressure level were overall younger ( $43 \pm 12$  years-old) than those who would ask ( $52 \pm 12$  years-old) ( $p=0.04$ ) (Figure 4). No correlation was found between the educational level of the participants and



**FIGURE 4.** Age difference between participants who would and who would not ask about their blood pressure level

the answers received. Likewise, no correlation was found between gender and the answers received.

## DISCUSSIONS

Tension-type headache (TTH) is the most common primary headache encountered in the general population [5]. The diagnosis and treatment of TTH are established by the neurologist, which should explain to the patient that the headache is not caused by elevated blood pressure and thus, treatment is not directed at lowering the blood pressure. The one-year prevalence for episodic and chronic TTH in a population-based study has been calculated at 38.3% and 2.2%, respectively. Both conditions were more frequent in women [6]. A study from Denmark has shown that the prevalence of TTH (but not that of migraine) has increased over the years, based on data collected in 2001 and then compared with data from 1989 [7].

Meanwhile, the global age-standardized prevalence of arterial hypertension in 2019 (for adults aged 30-79 years-old) was reported as being 32% in women and 34% in men [8]. High blood pressure (HBP) or arterial hypertension is currently defined as a systolic blood pressure of  $\geq 130$  mmHg, and/or a diastolic blood pressure of  $\geq 80$  mmHg [9].

It is therefore clear that both tension-type headache and arterial hypertension are very common in the general population (and in clinical practice).

TTH should be diagnosed in accordance with the available diagnostic criteria, and differentiated from other headache syndromes. If we analyze the main criteria for episodic TTH and chronic TTH (Table 2), we will find that the presence (or absence) of HBP is not mentioned at all (neither as an associated feature, nor in the exclusion criteria) [1]. However, an

**TABLE 2.** Diagnostic criteria for episodic TTH and chronic TTH

Criterion	Episodic TTH	Chronic TTH
<b>A (frequency)</b>	At least 10 episodes of headache fulfilling all the criteria listed	Headache occurring on average $\geq 15$ days per month and for more than 3 months ( $\geq 180$ days per year) and fulfilling all the criteria listed
<b>B (duration)</b>	Between 30 minutes – 7 days	Hours to days, or unremitting
<b>C (clinical characteristics) (at least 2 of the following)</b>	✓ <i>Location:</i> bilateral	✓ <i>Location:</i> bilateral
	✓ <i>Intensity:</i> mild to moderate	✓ <i>Intensity:</i> mild to moderate
	✓ <i>Quality:</i> pressing or tightening ( <i>non-pulsating</i> )	✓ <i>Quality:</i> pressing or tightening ( <i>non-pulsating</i> )
	✓ <i>Not aggravated by routine physical activity</i>	✓ <i>Not aggravated by routine physical activity</i>
<b>D (exclusion criteria) (both of the following)</b>	» No nausea or vomiting	» No moderate-to-severe nausea or vomiting
	» No more than one of photophobia or phonophobia	» No more than one of photophobia, phonophobia or mild nausea
<b>E</b>	Not better accounted for by another ICHD-3 diagnosis	

essential feature is that the clinical picture cannot be better accounted for by any other ICHD-3 diagnosis (such as hypertensive encephalopathy).

Headache is of course one of the main symptoms of hypertensive encephalopathy, which is defined as a relatively rapidly evolving syndrome of severe hypertension, usually with a systolic pressure above 195 mmHg. It is worth mentioning that hypertensive encephalopathy can appear at lower levels of blood pressure (even slightly above normal), as it is the abrupt and rapid elevation that is responsible for the symptoms, and not the absolute value of the blood pressure [10]. The headache in this setting is usually constant, non-localized and moderate-to-severe in intensity, and may be associated with other neurologic symptoms (especially visual impairment and seizures) [11].

In general, studies regarding the association between headache and blood pressure have been conflicting.

For example, in the paper published by Friedman and colleagues, patients presenting with headache at the Emergency Department were more likely to have markedly or severely elevated BP, however the improvement in headache was not associated with a corresponding improvement of blood pressure levels [15].

Gus et al. did not find an association with headache in patients with mild hypertension who were evaluated by ambulatory BP monitoring. In their study, 25 out of 76 patients developed headache during the BP monitoring, however the 24-hour BP curves did not differ between the two groups of patients (with and without headache). Moreover, the BP values registered during the headache attack did not differ from those measured before and after the attack. The author's conclusion was that patients with hypertension should be discouraged from estimating their blood pressure levels by relying solely on the presence of headache [13].

After analyzing data from two epidemiologic studies, Tronvik et al noted that higher systolic blood pressure levels and higher pulse pressure levels correlated in fact with a decreased prevalence of both migraine and non-migraine headache. This finding was explained by the authors through the so-called hypertension-induced hypoalgesia phenomenon, in that stimulation of the baroreflex arch (by the raised blood pressure) is believed to decrease pain transmission, possibly because of an interaction between brainstem centers modulating cardiovascular function and nociception [14]. A similar result was reached by Wang and associates in post-menopausal women. There was a negative association between increasing values of systolic blood pressure and pulse pressure on one hand, and the occurrence of TTH, migraine, and unclassified headache on the other hand [15].

The use of anti-hypertensive medications is not mentioned in the current treatment guidelines for TTH [16]. The best approach for treating episodic TTH is to give simple analgesics and non-steroidal anti-inflammatory drugs. In contrast, chronic TTH may require the use of prophylactic treatment with an antidepressant (such as Amitriptyline, Venlafaxine or Mirtazapine).

The situation changes when discussing the potential association between HBP and migraine (especially since TTH and migraine may be confused with one another, and may even overlap in some patients). Migraineurs may have an increased risk of developing high blood pressure, however hypertensive patients do not seem to be at an increased risk of developing migraine (or other headache types). Migraine and arterial hypertension may share some common pathogenic mechanisms, and it is well known that anti-hypertensive medications (especially beta-blockers, ACE inhibitors or angiotensin II receptor blockers) are useful in the prevention of migraine attacks [17].

## CONCLUSIONS

Some people may erroneously believe that tension-type headache relates to arterial hypertension,



and many would ask the physician about their blood pressure level (if they were to receive this diagnosis). Younger patients are less likely to ask about their blood pressure level than older patients.

Communication is essential for a correct understanding of the diagnosis. If the patient understands that there is no connection between blood pressure

and tension-type headache, then treatment adherence might improve.

The best approach would be to refer all patients with headache to a headache specialist (that is, a neurologist specialized in headache disorders), who has the expertise to correctly diagnose and treat these disorders (including TTH).

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