

# Secondary headaches

( Wtórne bóle głowy )

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**Abstract** – Introduction. Introduction. Secondary headaches can result from many dangerous and life-threatening diseases. It may occur in the course of, among others, brain tumour, intracranial haematoma, meningitis, neuroborreliosis, systemic vasculitis, an aneurysm of the dissecting carotid artery, etc. The basis for the differentiation of these ailments are prerequisites for appropriate rescue measures at the site of the incident as well as for appropriate specialist treatment.

The aim of the study. The aim of the study was to present characteristics of secondary headaches.

Selection of material. The search was conducted in the Scopus database using the terms secondary headache, diagnostics 2004-2018. The literature found in the Google Scholar database was analysed for the highest number of citations. The literature selected in this way was used as the material for this study.

Conclusions. The most dangerous factors associated with secondary headaches include head or neck vascular diseases, which include atherosclerosis of the neck arteries, hypertension and strokes. Proper initial diagnosis determines the therapeutic success, e.g. in ischemic strokes, it is important to use the so-called therapeutic window (for the used rt-PA - time up to 4 and a half hours from the first symptoms or mechanical thrombectomy - time up to 6 hours).

**Key words** - secondary headache, differential diagnosis.

**Streszczenie** – Wstęp. Wtórny ból głowy może być następstwem wielu niebezpiecznych i groźnych dla życia chorób. Może występować w przebiegu m.in. guza mózgu, krwaka śródczaszkowego, zapalenia opon mózgowo-rdzeniowych, neuroborreliozy, układowego zapalenia naczyń, tętniaka rozwarstwiającego tętnicy szyjnej itd. Podstawy różnicowania tych dolegliwości stanowią przesłanki do podjęcia właściwych działań ratunkowych na miejscu zdarzenia a także właściwego leczenia specjalistycznego. Cel pracy. Celem pracy było przedstawienie charakterystyki wtórnych bólów głowy.

Dobór materiału. Poszukiwania przeprowadzono w bazie Scopus używając pojęć *wtórny ból głowy*, *diagnostyka* 2004-2018r. Znalezione piśmiennictwo w bazie Google Scholar przeanalizowano pod kątem największej liczby cytowań. Tak wyselekcjonowane piśmiennictwo posłużyło za materiał do opracowania niniejszej pracy.

Wnioski. Do najbardziej niebezpiecznych czynników powiązanych z wtórnymi bólami głowy należą choroby naczyń głowy lub szyi, do których zalicza się miażdżycę tętnic szyi, nadciśnienie

nie tętnicze i udary mózgu. Właściwe wstępne rozpoznanie decyduje o sukcesie terapeutycznym np. w udarach niedokrwiennych ważnym jest wykorzystanie tzw. okna terapeutycznego (dla stosowanego rt-PA - czas do 4 i pół godzin od pierwszych objawów czy mechanicznej trombektomii - czas do 6 godzin).

**Słowa kluczowe** - wtórny ból głowy, diagnostyka różnicowa.

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- A. The idea and the planning of the study
- B. Gathering and listing data
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Accepted for publication: February 20, 2020.

## I. INTRODUCTION

Secondary pain can be much more dangerous than spontaneous pain, as it can be caused by various dangerous diseases. According to the International Classification of Headaches, the basic types of these types of symptoms include [1-4]:

- pains caused by head or neck injuries,

- pain associated with head or neck vascular diseases,
- pain associated with intracranial disorders - other than of vascular origin,
- pain caused by chemical substances (drugs, alcohol, drugs, contaminated food) or after they have been stopped,
  - pain resulting from disease and toxic infections,
  - pain attributed to a homeostasis disorder,
  - pain associated with changes in head, teeth and other facial structures,
  - pain caused by mental disorders.

From the above list it follows that there is a large group of factors that can cause symptomatic headaches.

## II. CROSSES AND EXPLANATIONS

Undoubtedly, the most dangerous factors include those associated with head or neck vascular diseases, which include atherosclerosis of the neck arteries, hypertension and strokes. Atherosclerosis is a disease of elastic and large muscle arteries, which is characterized in its advanced state by significant thickening of the internal membrane of the arteries, as a result of the accumulation of cholesterol and fibrous lesions, which causes the narrowing of the blood flow light, the formation of thrombi and congestion in the arteries and microcirculation vessels.

Atherosclerosis is a direct or indirect cause of many diseases, most of which can result in death. The proper blood flow in the body performs very important and basic functions. Therefore, all its disorders cause significant pathologies in the functioning of all important human organs, including the brain, heart, lungs, kidneys, liver and muscles. In this sense atherosclerosis is a disease of the whole organism and affects the general state of human health and well-being. The most serious diseases caused by atherosclerosis include coronary artery disease, including angina pectoris, myocardial infarction and stroke. Atherosclerosis can also be a cause of intermittent chrome plating, lower limb gangrene, kidney disease, stroke. [5-9]

Stroke occurs in two basic types [7,10-13]:

- ischemic stroke, affects 90% of all strokes,
- hemorrhagic stroke - occurs in about 10% of all strokes.

Both types of stroke never occur together. A haemorrhagic stroke is characterized by the occurrence of blood flow from an artery type blood vessel. It can be subarachnoid or intracerebral haemorrhage, and the primary cause of the haemorrhage is a rupture of an aneurysm or hemangioma, causing haemorrhage in the space between the

arachnoid and soft tire of the brain. Haemorrhagic stroke is very dangerous for the health and life of the patient, and the factor that has a strong influence on the appearance of this disease is arterial hypertension.

The second type of stroke is called ischaemic. In the case of this type of stroke, the blood flow through the arteries is stopped or critically reduced, resulting in ischemia and significant damage to brain tissue. This stroke is caused by the closure or narrowing of the lumen of the intracerebral vessels or arteries that supply blood to the brain, or by hemodynamic disorders that reduce brain flow. Cerebral circulation failure may cause single or multiple infarcts [6,7,14-16].

In the case of haemorrhagic stroke, a typical symptom is a very strong and sudden headache. This pain is so intense, even penetrating that it is difficult to confuse it with a typical headache for other reasons. Other symptoms of hemorrhagic stroke include vomiting and seizures and often loss of consciousness.

A patient after a haemorrhagic stroke has respiratory problems and significant disturbances in consciousness. Brain swelling occurs and complete cardiac arrest in the brain can occur, which is a major threat to the patient's life. [16,17].

In the case of ischaemic stroke, the symptoms may be markedly different depending on the extent and location of brain tissue damage due to temporary hypoxia caused by embolism. Some areas of the brain are responsible for the functioning of selected organs and organs, e.g. speech, sensation, walking, etc. The location of the stroke in the left or right cerebral hemisphere is important.

Ischemic strokes are also preceded by severe headaches and dizziness, but this is already a symptom of a blockage. In the preceding period, the patient may feel very well and not feel any symptoms.[18-20] Other typical symptoms of ischaemic stroke include [21-23]:

- numbness or tingling of arms or legs on one side of the body,
- a complete paralysis of the hand or leg or one part of the body may occur,
- unilateral dropping of the eyelid or corner of the mouth,
- urinary and/or faecal incontinence,
- speech disorders, fuzzy or gibberish speech, so-called aphasia, difficulties in understanding other people's speech,
- vision problems (usually per eye),
- sometimes there is a hunchback or hypersensitivity to touch in some parts of the body,

- problems with balance and gait, unsteady gait, unstable gait, falling over or tripping, but quite rarely does the patient lose consciousness,
- awareness disorders, loss of orientation over time,
- sometimes there is increased pressure.

The extent of the symptoms of ischaemic stroke depends on the location of the blockage and whether the blockage tends to increase or to self-destruct.

Headache may also be caused by hypertension. Hypertonia arterialis (HA) is the most briefly fixed increase in arterial pressure, where systolic pressure is at least 140 mm Hg and/or diastolic pressure is at least 90 mm Hg. Currently, based on numerous studies, the guidelines of ESH - European Society for Hypertension and ESC - European Society for Cardiology on the management of hypertension have been developed and published. According to the ESH and ESC classification, there is optimal arterial pressure, normal, high, three levels of hypertension and isolated systolic hypertension. The methods of arterial blood pressure classification are presented in Table 2.

Table 1. Blood pressure classification methods [24]

Pressure	Systolic (SBP) in mmHg		Diastolic (DBP) in mm Hg
optimal	less than 120	i	less than 80
correct	120 – 129	i/lub	80 – 84
high-profile	130 – 139	i/lub	85 - 89
1st degree hypertension (mild)	140 – 159	i/lub	90 - 99
2nd degree hypertension (moderate)	160 – 179	i/lub	100 – 109
3rd degree hypertension (heavy)	at least 180	i/lub	at least 110
insulated systolic hypertension	at least 140	i	less than 90

Arterial hypertension manifests itself in permanent high blood vessel pressure and the phenomenon is unfavourable for the human body as it may lead to damage to blood vessel walls (veins and arteries) and internal organs.

A relatively large part of the modern world population suffers from arterial hypertension. According to the World Health Organization, the number of people suffering from hypertension worldwide is one billion, and by 2025 it will be about 1.5 billion. The majority of these people live in the most developed countries of the world. [1,25,26] It is not easy to diagnose a person with hypertension on one's

own, as to a large extent (except for very high hypertension) the disease is asymptomatic.

However, the symptoms that may indicate potential hypertension include. [1,26]:

- headache and tinnitus, vomiting,
- a general feeling of weakness, breakdown and anxiety,
- dizziness, fainting and fainting,
- the feeling of palpitations and pain in the heart area, paroxysmal tachycardia,
- suffocation during exercise, quick fatigue,
- nose bleeding,
- nervousness, hyperactivity and sleep disturbance,
- visual disturbance and impairment of vision.

In Poland the medical diagnosis of hypertension is at a low level - lower than in other European countries. It is estimated that about 30% of patients have undiagnosed hypertension, and another 9% of patients have hypertension diagnosed but untreated. Only 26% of patients with hypertension are treated effectively. [27]

Other causes of secondary headaches include meningitis. It is characterized by acute and severe headache, neck stiffness and fever. The pain is most often exacerbated by eyeball movements. Pain of this kind can be easily mistaken for migraine.

Headache also occurs in case of brain tumor. Acute headache affects about 1/3 of cases of this disease. This pain occurs intermittently, it is seated deep inside the head and has the character of blunt pain, which may intensify with changes in body position. Secondary headache can be caused by a variety of factors including mechanical trauma or biological and chemical poisoning. In practice, headache is most common in infectious diseases such as flu, tonsillitis, ear, throat and respiratory diseases. Headache also occurs in diseases and toothache. [1,28-30]

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