▪ Headache Medicine 2022, 13(3):163-166 ▪ p-ISSN 2178-7468, e-ISSN 2763-6178

Headache Medicine

▪ DOI: 10.48208/HeadacheMed.2022.15

Review

Secondary hypnic headache: A literature review in the last 34 years

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Edited by:
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Abstract

Introduction

Hypnic headache is a rare primary headache disorder that occurs during sleep. Its pathophysiology is uncertain, but hypothalamic dysfunction is hypothesized. It is usually a primary headache, but it can have secondary causes.

Objectives

We aimed was to review articles published in the last 34 years on hypnic headache and analyze secondary cases.

Methods

Based on a literature search in the major medical databases and using the descriptor "hypnic headache" we included articles published between 1988 and 2020. Of the 359 patients found, only 18 met the inclusion criteria and were analyzed.

Results

We found 18 patients (6 men and 12 women) with secondary hypnic headache. The mean age of patients was 58.7 ± 15.0 years, ranging from 20 to 84 years. The causes of hypnic headache were attributed to cranial vascular disorder (five), to non-vascular intracranial disorder (six), to a substance or its withdrawal (three) and to disorder of homoeostasis (four).

Conclusions

Although most cases of hypnic headache are primary, some symptomatic cases are described in the literature.

Keywords:
Secondary headache
Nocturnal headache
Sleep headache
Hypnic headache

Received: July 7, 2022
Accepted: September 6, 2022

Introduction

Hypnic headache is a rare primary headache disorder, also known as wake-up headache, because it occurs at the same time of night. It was first described by Raskin in 1988 from a study of six patients.[1] The first diagnostic criteria for this headache were suggested by Goadsby and Lipton in 1997[2] and included in the second edition of the International Classification of Headache Disorders (ICHD-2) in 2004.[3]

The last published review of hypnic headache described 348 cases (343 adults and 5 children) that have been described since 1988. In the adult population, this study showed a prevalence that ranged from 0.07% to 1.4%, with a predominance in women (69%). In more than 90% of these patients, the pain started after the age of 50, with a mean age of 58.0 ± 13.1 years.[4]

Clinically, hypnic headache is characterized by recurrent attacks of headache on more than 10 days per month, developing only during sleep, causing the patient to wake up, lasting up to four hours and without cranial autonomic symptoms. The pain is not attributed to the other pathology.[5]

The pathophysiology of hypnic headache is not well understood yet. There are only speculations for the exact pathophysiological mechanism, as the studies are not experimental. There are several hypotheses that suggest hypothalamic dysfunction in patients with hypnic headache. First, the pain occurs at the same time of night; second, the hypothalamus as a circadian pacemaker regulates sleep and wakefulness and is involved in pain control; and third, there are MRI studies showing a decrease in gray matter volume in the posterior hypothalamus of these patients.[6-8]

Despite not being attributed to another pathology, some cases of hypnic headache have been described in the literature as secondary to several causes. To the best of our knowledge, this is the first review of secondary cases of hypnic headache.

Methods

This study was an integrative and retrospective review of the articles on hypnic headache published in the last 34 years, since the first description. The research was performed in the online databases LiLacs, SciELO and PubMed, from May to June 2022, using the descriptor "hypnic headache".

Articles published from 1988 to 2022 describing secondary hypnic headache and written in English were included. Of the 359 patients found, only 18 met the inclusion criteria and were analyzed.

Results

We found 18 patients (6 men and 12 women) with secondary hypnic headache. The mean age of patients was 58.7 ± 15.0 years, ranging from 20 to 84 years. The causes of hypnic headache were attributed to cranial vascular disorder (five), to non-vascular intracranial disorder (six), to a substance or its withdrawal (three) and to disorder of homoeostasis (four), as shown in Table 1.

Table 1. Distribution of 18 cases of secondary hypnic headache published from 1988 to 2022, according to age, sex and etiology

Etiology	Author (s), Year	Cases	Age (year)	Sex (M/F)
Attributed to cranial vascular disorder				
Pontine ischemic injury	Moon et al., 2006[9]	1	71	M
Idiopathic cyclic edema	Godoy, 2010[10]	1	56	M
Basilar artery dolichoectasia	Moreira et al., 2015[11]	1	69	F
Basilar artery dolichoectasia	Fonseca et al., 2016[12]	1	54	M
Intracranial aneurysm	Alfred et al., 2022[13]	1	20	F
Attributed to non-vascular intracranial disorder				
Posterior fossa meningioma	Peatfield et al., 2003[14]	1	54	F
Nonfunctioning pituitary macroadenoma	Garza et al., 2009[15]	1	74	F
GH-secreting pituitary tumour	Valentinis et al. 2009[16]	1	66	M
Haemangioblastoma of the cerebellum	Mullally et al., 2010[17]	1	58	M
Acoustic neuroma	Ceronie et al., 2021[18]	1	40	F
Intracranial hypotension	Freeman et al., 2004[19]	1	80	M
Attributed to a substance or its withdrawal				
Medication-overuse headache	Baykan et al., 2008[20]	1	54	F
After medication withdrawal	Karlovasitou et al., 2009[21]	1	54	F
ACE inhibitor withdrawal	Eccles et al., 2007[22]	1	84	F
Attributed to disorder of homoeostasis				
Sleep apnoea headache	Bender, 2012[23]	1	45	F
Nocturnal arterial hypertension	Silva-Néto et al., 2013[24]	1	60	F
Nocturnal arterial hypertension	Gil-Gouveia et al., 2007[25]	1	54	F
Nocturnal hypoglycemia	Silva-Néto et al., 2019[26]	1	64	F

F: female; M: male; ACE: angiotensin converting enzyme; GH: growing hormone.

Discussion

According to ICHD-3, hypnic headache has well-defined diagnostic criteria and is not attributed to another disorder.[5] However, there are other headaches that also occur during sleep or when waking up, but are secondary to other pathologies. Therefore, it is necessary to make a differential

diagnosis with all forms of headache that have a nocturnal rhythm. Obviously, the clinical history is fundamental for this diagnosis and the investigation with complementary exams must be evaluated according to the evidence of the case.

In 91% of patients with hypnic headache, the pain starts after the age of 50 years,[4] and in this age group, secondary headaches are more frequently present. Therefore, in the presence of an elderly patient who has nocturnal headache, even fulfilling the diagnostic criteria for hypnic headache, complementary exams should be requested. This investigation includes neuroimaging tests (computed tomography, magnetic resonance and/or magnetic resonance angiography), polysomnography and laboratory tests.

Some cranial vascular disorders may clinically present with severe nocturnal headaches that resemble hypnic headaches. There are several case reports of patients with ischemic injuries and arterial malformations such as dilatation and/or elongation of intracranial arteries or veins have been described with secondary hypnic headache.[9-13]

Headache attributed to nonvascular intracranial disorder such as neoplasms (benign or malignant)[14-18] or CSF hypotension[19] may occur similarly to primary headaches, fulfilling diagnostic criteria for migraine or tension-type headache. Usually, headache in tumor lesions is intermittent, with onset at night or upon awakening, moderate intensity and associated with vomiting.

Patients with chronic daily headache resulting from migraine or tension-type headache often self-medicate and develop a secondary form of headache called medication overuse headache. On the other hand, patients who abruptly withdraw from the use of a substance may develop headache due to their withdrawal. Headache attributed to a substance or its withdrawal may occur during the night or upon waking.[20-22]

Sleep apnea headache is a homeostasis disorder that needs to be differentiated from hypnic headache.[23] In this disorder, the patient sleeps without pain, but has a morning headache, usually bilateral and lasting less than four hours, caused by sleep apnea. It goes away with successful sleep apnea treatment. However, there are other disorders of homeostasis in which the patient is awakened at dawn with headache, but high blood pressure[24,25] and low blood glucose levels[26] rule out hypnic headache.

Conclusion

Although most cases of hypnic headache are primary, many symptomatic cases are described in the literature.

Contribution authors: All authors had the same contribution

Funding: No

Conflict of interests: The authors report no conflict of interest

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