Case Report

Immediate Management of Summer-Related Burning Headache Using Hydrotherapy – A Case Study

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ABSTRACT

Burning-type headaches associated with a sensation of internal heat are an uncommon but distressing presentation, particularly in hot environmental conditions. Evidence regarding immediate non-pharmacological management strategies remains limited. This case report describes the rapid effect of cold hydrotherapy in a 26-year-old female presenting with an acute-onset severe burning headache accompanied by a subjective sensation of intense internal heat, especially during inhalation. Symptoms were aggravated by heat exposure and direct airflow. Pain intensity was assessed using the Visual Analog Scale (VAS), and associated symptoms were graded using a Likert scale. Cold compress hydrotherapy was applied over the forehead and periorbital region for 20 minutes. A marked reduction in symptoms was observed, with VAS scores decreasing from 8/10 to 1/10 and complete resolution of heat sensation and breathing discomfort. No adverse effects were noted. This case highlights the potential role of cold hydrotherapy as a simple, cost-effective, and rapid intervention in managing acute heat-associated headache conditions. Further studies are required to validate its efficacy and underlying mechanisms.

Key words: Headache, Hydrotherapy, Cryotherapy, Pain Measurement

Headache disorders are among the most prevalent neurological conditions globally and represent a major public health concern due to their significant contribution to disability and reduced quality of life [1,2]. Epidemiological data indicate that headache disorders, including migraine and tension-type headache, affect a substantial proportion of the population and are ranked among the leading causes of years lived with disability worldwide [2,3]. Although most headache presentations are classified under well-defined primary headache disorders, atypical manifestations characterized by burning sensations and internal heat perception remain underreported in biomedical literature. Environmental factors play an important role in the development of headaches. Exposure to elevated ambient temperature can result in vasodilation, altered nociceptive processing, and activation of inflammatory pathways, contributing to headache generation [4].

Additionally, irritation of the nasal and sinus mucosa due to heat exposure may produce a subjective sensation of internal warmth during respiration, even in the absence of measurable external temperature changes. As these symptoms are inherently subjective and difficult to quantify objectively, validated patient-reported outcome measures such as the

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Visual Analog Scale (VAS) and Likert-type scales are widely used and considered reliable for assessing pain and symptom severity in clinical research [5,6]. Traditional Chinese Medicine (TCM) provides a complementary framework for understanding such symptom complexes. According to TCM theory, the Liver governs the smooth flow of Qi, and pathological conditions such as Liver Fire ascending may result in excessive heat rising toward the head. When combined with Wind, this may generate a Wind-Heat pattern, characterized by burning headache, heat sensation, dryness, and involvement of the sensory orifices, including the eyes and nasal passages [7].

This upward movement of pathological heat may also disrupt the descending function of Lung Qi, contributing to altered respiratory sensations such as heat during inhalation. Hydrotherapy, particularly cold application, is widely utilized in integrative medicine for its analgesic and anti-inflammatory effects. Cold therapy induces vasoconstriction, reduces local metabolic activity, and modulates nociceptive transmission, thereby alleviating pain and inflammation [8]. From a TCM perspective, cold applications may also be interpreted as a method to clear excess Heat and restore internal balance. Despite its traditional and clinical use, there is limited documented evidence regarding the immediate effectiveness

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of cold hydrotherapy in managing burning-type headaches, especially those interpreted through TCM pattern differentiation. Therefore, this case report aims to describe the immediate therapeutic effect of cold compress hydrotherapy in a patient presenting with a summer-related burning headache, integrating both biomedical and TCM perspectives.

CASE DESCRIPTION

A 26-year-old female presented with a one-day history of acute onset severe burning headache, described as a diffuse burning sensation over the head, associated with a marked subjective perception of intense internal heat localized to the craniofacial region. The patient reported that this sensation was particularly pronounced during inhalation, during which she perceived hot air passing through the nasal passages and sinus regions, leading to interruption of full inspiratory effort; however, there were no features suggestive of true dyspnea, such as air hunger, wheezing, or chest tightness. The symptoms were aggravated by exposure to hot environmental conditions and direct airflow (fan).

There were no associated features such as nausea, vomiting, photophobia, phonophobia, visual disturbances, or aura, and no history of fever, upper respiratory tract infection, sinusitis, head trauma, or prior similar episodes. The patient was not on any regular medication and had no known comorbidities. There was no previous history of similar episodes, migraines, or chronic headache disorders. On general physical examination, she was conscious, oriented, and cooperative, with vital parameters within normal limits, including a respiratory rate of 16–18 breaths per minute, and no signs of respiratory distress. Neurological examination revealed no focal deficits, and cranial nerve functions were intact. Local examination of the head and face did not reveal any tenderness, swelling, or visible inflammation, and external skin temperature over the forehead and perinasal region was within normal limits on palpation.

Based on acute onset, burning quality of pain, association with heat exposure, and absence of neurological deficits or other red flag signs, a provisional clinical diagnosis of acute heat-induced headache (summer-related burning headache), categorized under a non-specific primary headache, was made. From a TCM perspective, the presentation was consistent with a pattern of Liver Fire ascending in combination with Wind-Heat, characterized by upward movement of pathological heat affecting the head and sensory orifices, leading to burning headache, internal heat sensation, and disturbance of the nasal and sinus pathways, with secondary interference in the normal descending function of Lung Qi, manifesting as discomfort during inhalation.

INTERVENTION

Cold hydrotherapy was administered as a localized cooling intervention in the form of a cold compress applied over the forehead and periorbital region. A clean cloth soaked in cold water with added ice was used and maintained at a tolerable temperature throughout the procedure. The patient was positioned comfortably in a relaxed supine posture in a well-ventilated room. The cold compress was applied continuously for a duration of 20 minutes, with intermittent adjustment to ensure a sustained cooling effect and patient comfort. Care was taken to avoid excessive pressure over the eyes and to maintain uniform contact over the frontal and periorbital areas.

The intervention was selected based on its potential to provide rapid symptomatic relief through local cooling, aiming to reduce the perceived internal heat and burning sensation. From an integrative perspective, the application was intended to facilitate thermal regulation, induce vasoconstriction, and modulate nociceptive signaling, while also aligning with TCM principles of clearing excess Heat and dispersing Wind affecting the head region. No concurrent pharmacological treatment or additional therapeutic modality was administered during this period. The patient was followed up after 24 hours and after 3 days, during which she reported complete resolution of symptoms with no recurrence.

RESULTS

Following the intervention, the patient demonstrated a rapid and marked improvement in symptoms. Within 20 minutes of cold compress application, the burning headache and internal heat sensation subsided significantly. The VAS score for pain and burning intensity reduced from 8/10 at baseline to 1/10 post-intervention. Similarly, the severity of burning heat sensation and inspiratory discomfort, assessed using a 4-point Likert scale, decreased from 4/4 (Intolerable) to 0/4 (absent). The patient reported complete symptomatic relief, with resolution of the sensation of hot air during inhalation and restoration of a normal, uninterrupted breathing pattern. No adverse effects or discomfort were noted during or after the procedure. The observed outcome indicates an immediate therapeutic response to the cold hydrotherapy intervention in alleviating the acute burning-type headache and associated symptoms.

Table 1 - Pre- and Post-Intervention Assessment

Parameter	Before Intervention	After Intervention
VAS (Pain/Burning Intensity)	8/10	1/10
Burning Heat Sensation (Likert Scale 0–4)	4/4 (Intolerable)	0/4 (Absent)
Inspiratory Heat Discomfort	Present (interrupting inhalation)	Absent
Breathing Pattern	Interrupted inhalation	Normal, uninterrupted
Respiratory Rate	16–18 breaths/min	16–18 breaths/min
Associated Symptoms	Internal heat, sinus discomfort	Completely relieved

DISCUSSION

This case highlights the rapid relief of a burning-type headache associated with an internal heat sensation following cold hydrotherapy. Unlike typical primary headache disorders such as migraine or tension-type headache, the clinical presentation in this case was characterized predominantly by a burning quality of pain and heat perception, without associated features such as photophobia, phonophobia, or neurological deficits. Such atypical symptomatology may be explained through mechanisms involving thermoregulatory imbalance and altered nociceptive processing. Exposure to elevated ambient temperatures has been shown to induce vasodilation, activate thermosensitive nociceptors, and modulate inflammatory pathways, all of which may contribute to headache generation and altered sensory perception within craniofacial structures [4].

Previous studies have shown that cold therapy is effective in reducing pain and inflammation in various clinical conditions. However, there is limited evidence specifically addressing burning-type headache associated with internal heat sensation. This highlights the clinical relevance of the present case in demonstrating the immediate effect of cold hydrotherapy [9,10]. An important clinical feature in this case was the patient's perception of intense heat during inhalation, localized to the nasal and sinus mucosa, despite the absence of elevated external skin temperature. This finding underscores the role of internal sensory processing in symptom generation. The nasal mucosa is richly innervated and highly sensitive to thermal stimuli, and previous studies have demonstrated that thermal receptors within the nasal cavity can produce exaggerated sensations of heat or cold independent of actual temperature changes [11,12]. This explains why objective measurements, such as skin temperature, may not reflect the patient's subjective experience, thereby reinforcing the importance of validated subjective assessment tools such as the VAS in evaluating such conditions [5,6].

From a TCM perspective, the condition can be explained as Liver Fire ascending with Wind-Heat, which justifies the use of cooling therapy. The aggravation of symptoms with environmental heat and the localization to the head and nasal passages further support the involvement of Wind-Heat. Additionally, the disturbance of inhalation can be interpreted as a disruption of the descending function of Lung Qi due to the upward movement of Heat [13,14]. This study is limited by its single-case design and lack of objective measurements. The findings cannot be generalized. Further studies with larger sample sizes and controlled designs are required to validate these results and better understand the underlying mechanisms.

CONCLUSION

Cold hydrotherapy provided rapid relief in an acute burning-type headache and may be considered a simple, non-invasive intervention. Further studies are needed to confirm its effectiveness.

Patient Consent: Written informed consent was obtained from the patient for publication of this case report and associated clinical information. Patient identity has been kept confidential.

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