Headache Medicine

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Association between caffeine consumption and headache disorders: a systematic review

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Introduction
Caffeine is one of the most widely consumed psychoactive substances worldwide and has a complex relationship with headache disorders. While moderate intake may provide analgesic benefits, excessive consumption and withdrawal have been associated with increased headache frequency and migraine exacerbation. Given the growing consumption of caffeinated beverages, understanding this association is clinically relevant.

Objective
To analyze the relationship between caffeine consumption and headache disorders, focusing on the effects of excessive intake, withdrawal, and therapeutic use of caffeine on headache occurrence and severity.

Methods
A systematic review was conducted using the PubMed database. The descriptors "Caffeine", "Caffeine Consumption", "Coffee", "Headache", and "Migraine" were combined using the Boolean operators AND and OR. Clinical trials and observational studies published in English between 2016 and 2025 were included. Narrative reviews, editorials, duplicate studies, and articles unrelated to headache disorders were excluded. Study selection followed PRISMA recommendations through title, abstract, and full-text screening.

Results
The selected studies demonstrated a significant association between caffeine consumption and headache disorders. Excessive intake, particularly through energy drinks, was associated with increased headache frequency and neurological symptoms among adolescents. Caffeine withdrawal was identified as an important trigger for headache episodes. Conversely, randomized clinical trials showed beneficial effects of caffeine combined with analgesics, reducing headache intensity in conditions such as post-dural puncture headache and pregnancy-related headaches. Moderate consumption also demonstrated prophylactic effects in experimental models. However, chronic excessive intake was associated with headache chronification and impaired quality of life.

Conclusion
Caffeine may act as both a therapeutic adjunct and a triggering factor in headache disorders. Moderate consumption appears beneficial in specific situations, whereas excessive intake and withdrawal are associated with worse outcomes. These findings highlight the importance of assessing caffeine habits in patients with headache disorders. Further prospective studies are needed to establish safe consumption patterns and clarify underlying mechanisms.

Keywords:
Migraine
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