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Hair Ties and Headaches: The Pain Behind Perfect Hairstyles

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ABSTRACT

The underlying causes of headache disorders, which include primary headaches, secondary conditions, and environmental triggers, are among the most prevalent neurological complaints in women globally. The prevalence of headaches has been found to be significantly influenced by changeable environmental factors, including hairstyling habits. A particular type of headache known as an external compression or traction headache is caused by tight hairstyles, such as high ponytails, buns, braids, and hair extensions, which apply prolonged traction to the scalp and pericranial tissues. When the hair is loosened, these headaches generally subside. They usually start as localized discomfort at the location of hair tension and frequently spread to the temples, forehead, vertex, or neck. Even though these headaches are not generally harmful, their frequent recurrence can have a negative effect on daily activities, productivity, and quality of life. The prevalence,

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pathogenesis, risk factors, clinical presentation, and preventative measures of hairstyle-induced headaches in women are the main topics of this systematic study. A thorough literature search including papers from 2000 to 2025 was carried out using PubMed, Scopus, Web of Science, and Google Scholar. Both observational and interventional studies were considered, with quality assessed using the Newcastle-Ottawa Scale. Results indicate that the prevalence of hairstyle-induced headaches ranges from 30–50% in populations exposed to tight hairstyles. Factors increasing susceptibility include prolonged duration of tight hairstyle wear, preexisting migraine, heightened scalp sensitivity, hormonal fluctuations, and adolescent or young adult age. Mechanistically, these headaches arise from nerve compression (occipital, trigeminal, and auriculotemporal nerves), musculoskeletal strain of the neck and shoulders, scalp allodynia, and, occasionally, vascular alterations. Pain typically develops within 15–30 minutes of applying the hairstyle and may persist for several hours if tension is maintained. Preventive measures are highly effective and include loosening hairstyles, alternating hair arrangements, using soft hair ties, taking periodic breaks from tension hairstyles, and incorporating scalp massage or stretching routines. Pharmacologic interventions, such as over-the-counter analgesics, may provide relief for acute episodes. Education regarding the risk of hairstyle-induced headaches is crucial, particularly among adolescents, young adults, and women with a history of migraine. In conclusion, hairstyle-induced headaches are a prevalent, modifiable contributor to headache burden among women. Recognition of risk factors, understanding of underlying mechanisms, and adoption of preventive strategies can significantly reduce incidence and improve quality of life.

Keywords: Hairstyle-induced headache, ponytail headache, external compression headache, traction headache, scalp pain, women's health, musculoskeletal strain, preventive strategies, migraine susceptibility, hair tension.

Introduction

Almost 50% of adults experience headaches annually, making it one of the most common neurological complaint worldwide and a major contributor to disability and a lower quality of life.[1] Although a lot of research has been conducted on primary headaches including migraines and tension-type headaches, secondary headaches

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caused by external factors are sometimes neglected. Among these, headaches caused by hairstyles, often known as "ponytail headaches" or external compression headaches, are a distinct and preventable type of discomfort that primarily affects women.[2]

Hairstyling has both aesthetic and cultural value that cannot be understated. High ponytails, tight buns, braids, and hair extensions are examples of hairstyles that are frequently worn for convenience, fashion, or religious or cultural reasons. However, these styles may cause localized or regional pain by applying prolonged mechanical strain to the scalp, underlying muscles, and related brain processes.[3, 4] This condition, which was first explained by Blau in 2004, revealed a particular kind of headache that is different from other headache disorders and is exclusively brought on by hair traction.[2]

Although hairstyle-induced headaches are usually temporary and resolve quickly after the hairstyle is relaxed, their recurring nature can have a major negative influence on daily activities, productivity, and musculoskeletal health. Due to social pressures, fashion trends, and prolonged hairstyle maintenance, adolescents and young people seem more prone.[3,5] Pain perception may be influenced by both peripheral nerve stimulation and cerebral sensitization mechanisms, as evidenced by the higher risk in women with pre-existing migraine, increased scalp sensitivity, or musculoskeletal strain.[4,6]

In a study of Danish military personnel, Rahmani et al. (2017) found a high prevalence of headaches caused by helmets, showing how persistent external pressure on the scalp may mimic tension-type pain and activate cutaneous nociceptors.[7] Similarly, Rymchantowski et al. (2004) found that approximately 30% of Rio de Janeiro police officers had recurrent pain that was directly related to wearing a helmet.[8] These results highlight a common method of external pressure triggering pain-sensitive nerves, supporting the idea that prolonged compression or traction on the scalp, whether from helmets or hairstyles, can generate similar physiological responses.

Mechanistically, a combination of nerve compression, muscular strain, scalp allodynia, and, occasionally, temporary vascular alterations causes headaches by

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hairstyles. Nociceptive signalling is believed to be triggered by compression of the occipital, auriculotemporal, and trigeminal nerve branches, and discomfort is exacerbated by prolonged stress on the cervical and shoulder muscles.[3, 4, 6] Pain perception may also be influenced by hormonal fluctuations and scalp sensitivity, highlighting the complicated nature of this condition.[5,9]

Hairstyle-induced headaches are still mostly undiagnosed and frequently neglected in normal headache examination, despite growing findings in clinical literature. Inappropriate therapy, unnecessary investigations, and incorrect diagnoses could result from failing to identify this reason.[2, 3] Because this risk factor is adjustable, it is crucial for both doctors and affected persons to comprehend the epidemiology, pathophysiology, clinical presentation, and strategies for prevention. The aim of this systematic review is to comprehensively gather the most recent studies on women's headaches caused by hairstyles. By gathering recent research, this study provides a thorough framework for comprehending, diagnosing, and treating hairstyle-induced headaches with the goals of reducing pain, enhancing quality of life, and directing public health and educational activities.

Methods

A systematic literature search was performed across PubMed, Scopus, Web of Science, and Google Scholar using keywords: "hairstyle," "ponytail headache," "external compression headache," "traction headache," "hair tension headache," and "women."

Inclusion Criteria

1. Human studies published in English (2000–2025).
2. Observational studies, case reports, and interventional studies reporting on hairstyle-related headaches in women.

Exclusion Criteria

1. Studies focusing solely on primary headaches without external triggers.
2. Non-English language studies or conference abstracts without full text.

Quality of included studies was assessed using the Newcastle-Ottawa Scale for observational studies, and case reports were evaluated for methodological clarity. Data extraction focused on study design, sample size, hairstyle type, headache

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incidence, risk factors, and key findings.

Results

Several studies have evaluated the prevalence of hairstyle-induced headaches, often referred to as "ponytail headaches" or external traction headaches. Blau (2004) first described this condition in 93 women, finding that 50 participants (53%) reported headaches when wearing high ponytails. Pain was localized at the hair tie and radiated to the vertex, temples, forehead, or posterior neck. Relief typically occurred within minutes after loosening the hairstyle.[1]

Barreto et al. (2020) conducted a larger observational study including 100 women and reported a 40% prevalence of ponytail headaches, with higher susceptibility in participants with a history of migraine. Onset of headache occurred approximately 21.5 minutes after hairstyle application, with an average duration of 76 minutes.[2]

Zanib et al. (2025) assessed 140 adolescent girls wearing high ponytails or tightly styled hijabs and reported a 38% incidence of headaches, frequently associated with neck and shoulder discomfort. They concluded that prolonged scalp tension contributes to both headache and musculoskeletal strain.[3] In professional and occupational settings, strict grooming standards may exacerbate this issue. Franklin et al. (2021) discussed the U.S. military's evolving female grooming regulations, noting that tight buns and braids, while considered professional, have historically contributed to scalp discomfort and traction-related headaches among servicewomen [7]. Such reports highlight the interplay between cultural, occupational, and physiological factors in the development of this underrecognized condition.[10]

Abbas et al. (2022) compared the effects of tight ponytails versus modern hijab wear on cervicogenic headaches and postural deviations in young females, finding a 35% prevalence of headaches among participants, suggesting a musculoskeletal component associated with prolonged traction.[11]

Tight hairstyles irritate the occipital, auriculotemporal, and trigeminal nerve branches by applying pressure to the scalp. This nociceptive stimulation triggers localized or radiating pain.[4,6] Individuals with heightened sensory sensitivity may

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perceive normal traction as painful, a phenomenon similar to migraine-associated allodynia.[5,7] Sustained scalp tension can alter cervical and shoulder posture, inducing musculoskeletal discomfort that exacerbates headache severity.[3,11] Extreme traction may transiently affect scalp blood flow, potentially contributing to discomfort.[6]

High ponytails, buns, braids, and hair extensions generate greater scalp tension and are strongly associated with headache occurrence.[1,2,3] Longer durations correlate with higher incidence and severity of headaches.[3,5] Pre-existing migraine increases susceptibility to traction-induced headaches.[2,9] Individuals with high nerve density or hypersensitive scalp are more prone to pain.[4,5] Menstrual cycle-related hormonal changes may enhance pain sensitivity.[9]

Adolescents and young adults report higher prevalence, reflecting cultural and fashion trends.[3,5] Hairstyle-induced headaches typically manifest as; Localized scalp pain at the site of tension, often radiating to the vertex, temples, forehead, or neck.[1,2,3] Onset within 15–30 minutes of applying the hairstyle.[2,3] Duration from minutes to hours, usually relieved upon loosening the hairstyle.[1,3] Occasionally associated with musculoskeletal symptoms including neck or shoulder discomfort.[3,11] Effective prevention includes; Looser hairstyles and soft, elastic hair ties.[3,5] Alternating hairstyles to avoid continuous traction on the same scalp region. [3,5] Taking periodic breaks from tight hairstyles. [3,11] Scalp massage and cervical/shoulder stretching.[3,11] Education regarding the risk of hairstyle-induced headaches, particularly in adolescents and women with migraine.[2,3,5]

Table 1: ***Prevalence of Hairstyle-Induced Headaches***

Study	Year	Sample Size	Hairstyle Evaluated	Headache Incidence	Key Findings
Blau	2004	93 women	High ponytail	53% (50/93)	Pain localized at hair tie, radiated to vertex, temples, forehead, or neck; relieved within minutes of loosening

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					hairstyle [1]
Barreto et al.	2020	100 women	High ponytail	40%	Onset ~21.5 min; duration ~76 min; higher incidence in migraineurs[2]
Zanib et al.	2025	210 adolescent girls	High ponytail & tight hijab	38%	Headaches often accompanied by neck and shoulder discomfort; prolonged tension contributes to musculoskeletal strain[3]
Abbas et al.	2022	60 young females	Tight ponytail & hijab	35%	Suggests musculoskeletal contribution due to prolonged traction; affects posture [11]
Franklin JM, Wohltmann WE, Wong EB	2021		Buns, braids, ponytails (military standards)		Discusses transition in female military hair standards; highlights potential for tension-related discomfort and headaches with restrictive hairstyles [10]

Table 2: ***Mechanisms of Hairstyle-Induced Headaches***

Mechanism	Description
Nerve Compression	Tight hairstyles compress occipital, auriculotemporal, and trigeminal nerve branches, triggering nociceptive pain [4,6]
Scalp Allodynia	Increased sensory sensitivity leads to perception of pain even under normal traction, similar to migraine allodynia [5,9]

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Musculoskeletal Strain	Sustained tension alters cervical and shoulder posture, exacerbating pain [3,11]
Vascular Component	Extreme traction may temporarily affect scalp blood flow [6]

Table 3: ***Risk Factors for Hairstyle-Induced Headaches***

Risk Factor	Description
Hairstyle Type	High ponytails, buns, braids, and hair extensions produce greater scalp tension [1,2,3,10]
Duration of Wear	Longer duration of tight hairstyles increases incidence and severity [3,5]
Migraine History	Pre-existing migraine enhances susceptibility [2,9]
Scalp Sensitivity	High nerve density or hypersensitive scalp increases pain perception [4,5]
Hormonal Fluctuations	Menstrual cycle phases may increase sensitivity [9]
Age	Adolescents and young adults more commonly affected due to fashion and cultural trends [3,5]

Table 4: ***Clinical Presentation and Preventive Strategies***

Aspect	Details
Clinical Presentation	Localized scalp pain at tension site; radiates to vertex, temples, forehead, or neck; onset within 15–30 min; duration from minutes to hours; relieved upon loosening hair; sometimes associated with neck/shoulder discomfort [1,2,3,11]
Preventive Strategies	Looser hairstyles and soft hair ties; alternating hairstyles; periodic breaks; scalp massage and cervical/shoulder stretching; education about risk, especially for adolescents and migraineurs [2,3,5,11]

Discussion

Hairstyle-induced headaches represent a common and under-recognized secondary headache disorder in women. Tight hairstyles generate mechanical traction on the scalp, activating nociceptive fibers and compressing peripheral nerves such as the occipital, auriculotemporal, and trigeminal branches.[4,6] The pain is often localized at

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the hair tension site but can radiate to the vertex, temples, forehead, or neck, mimicking tension-type or cervicogenic headaches.[3,11]

Individuals with pre-existing migraine or heightened sensory sensitivity are particularly susceptible, possibly due to central sensitization, whereby the nervous system amplifies pain signals.[2,5,9] Adolescents and young adults are disproportionately affected, likely due to high-frequency use of tight ponytails, buns, braids, and hair extensions.[3,5]

The transient nature of these headaches typically allows spontaneous resolution upon loosening the hair, but repetitive occurrence may contribute to chronic discomfort, impaired daily functioning, and musculoskeletal strain.[3,11] Musculoskeletal factors are significant; prolonged traction can affect cervical posture, increase neck and shoulder tension, and exacerbate headache severity.[3,11]

Preventive strategies are simple and effective. Looser hairstyles, soft or elastic hair ties, alternating hair arrangements, periodic breaks, scalp massage, and stretching routines reduce incidence and severity.[3,5,11] Pharmacologic intervention, such as acetaminophen or NSAIDs, may provide short-term relief for acute episodes.[2,5] Education is critical; raising awareness in schools, universities, and salons can mitigate headache prevalence, especially among high-risk populations.[3,5] From a clinical perspective, healthcare providers should routinely inquire about hairstyling habits when evaluating women with localized scalp or traction-related headaches. Recognition of this modifiable cause prevents misdiagnosis, unnecessary imaging, and unwarranted pharmacologic interventions.[1,3,8]

Conclusion

Hairstyle-induced headaches are prevalent, preventable, and significantly affect quality of life. Education, safe hairstyling practices, and preventive interventions are key to reducing headache burden among women of all ages.

Limitations and Recommendations

Current research is limited. Most studies are observational, with small sample sizes and self-reported outcomes.

There is a need for:

1. Large-scale epidemiological studies to determine true prevalence.

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2. Controlled interventional trials assessing ergonomic hair accessories and preventive measures.
3. Investigations into cumulative effects of chronic scalp traction and interactions with migraine or hormonal cycles.[2,3,9]

Conflicts of Interest

There is no conflict of interest among the authors.

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