

Triggers of Pediatric Migraine

Subjects: Pediatrics

Contributor: Gaku Yamanaka

There are three triggers or risk factors for migraines in children and adolescents: stress, sleep poverty, and alimentation (including diet and obesity). Clinicians should advise patients to avoid certain triggers, such as stress and sleep disorders, and make a few conservative dietary changes.

Keywords: headache ; migraine ; prevention ; stress ; sleep poverty ; alimentation

1. Introduction

Migraine headaches are common in children, adolescents, and adults worldwide. Its robust negative impact can affect the quality of life of affected individuals in a manner similar to that of childhood cancer, heart disease, and rheumatic disease ^[1].

The estimated overall mean prevalence of headache is about 50% in the pediatric population according to population-based studies, and the overall mean prevalence of migraine is 9.1% ^{[2][3]}. Approximately half of the children with migraine also manifest migraines in adulthood ^{[4][5][6]}. Long-term migraine outcomes can be improved in childhood with early diagnosis and multidisciplinary intervention ^{[7][8]} comprising both pharmacologic and non-pharmacologic approaches (such as bio-behavioral and biofeedback therapy) ^{[9][9][10]}. In adults with migraines, educational initiatives are effective in reducing pain and disability ^{[11][12]} and improving the quality of life ^[13], but apart from this research, there are limited reports of non-pharmacological treatment focused on headache education in adolescents ^{[14][15]}.

Among these limited reports, a previous retrospective study showed that the participants' headaches reduced after conservative therapy alone, which consisted of good sleep hygiene, a no-additive diet, and limited sun exposure. The effect was particularly significant in younger children (under 6 years of age) as compared with older children ^[14]. A cluster-randomized trial involving 1674 adolescent patients with migraine, tension-type headache, or mixed headache assessed preventable risk factors (e.g., physical inactivity, coffee consumption, etc.), stress management, and guided muscle relaxation in the neck and shoulders; and showed a significant reduction in tension-type headaches, but not in migraines ^[15].

However, there is exceptional evidence in favor of cognitive-behavioral therapy (CBT). According to a recent systematic review, the odds of achieving a 50% or greater reduction in headache activity were 9.11-fold higher after treatment and 9.18-fold higher at the follow-up in patients receiving CBT as compared with those receiving control interventions ^[16]. Therefore, some researchers opine that CBT should be the first-line treatment for pediatric migraine due to the high evidence level and absence of associated harm ^[17]. However, CBT is not always practicable because psychological treatment may not be acceptable for some patients. It is costly, time-consuming, and may be effective only in older children who are capable of metacognition ^{[18][19]}. CBT may be available in only highly specialized facilities, which makes it difficult to spread the use of CBT widely.

Compared to the increasing volume of research in support of CBT—headache education, a basic and important non-pharmacological form of treatment—may get neglected. Although the current treatment guidelines focus on behavioral and lifestyle interventions to correct the factors commonly associated with migraine (negative emotional states, obesity and high body weight, infrequent exercise, and lack of sleep) ^[20], the focus on dispensing headache and migraine education is inadequate, making this an area that requires extensive research ^[21]. Without quality evidence on how proper headache education can improve outcomes, preventing migraines will remain challenging for many children and adolescents ^[21].

2. Prevalence of Trigger Factors in Migraine

Although there are several proposed triggers for migraine attacks, recent literature on the childhood triggers of migraine is limited, as shown in **Table 1** [22][23][24]. A retrospective clinical study assessed the prevalence of possible migraine trigger factors in 102 children and adolescents and found that the most frequently reported trigger factor was stress (75.5% of patients), followed by lack of sleep (69.6%), warm climate (68.6%), and video games (64.7%) [23]. The study also showed that the mean number of migraine triggers reported per subject was 7, and the mean time elapsed between exposure to a trigger factor and onset of the attack was 0–3 hours in 86% of patients. Later, to confirm these results, the same group conducted a prospective clinic-based study over a 3 month period on 101 pediatric patients; wherein each patient reported at least 1 trigger (range: 1–14; median: 3) with a total number of 532 attacks. The study demonstrated that lack of sleep (51.4%), stress (44.6%), warm climate (41.9%), noise (32.4%), and excitation (29.7%) emerged as triggers and that the period between trigger exposure and attack onset was 0–3 hours in 67.6% of patients [24]. Even if the number of triggers was lesser, the same results that implicated the four most-frequent triggers (lack of sleep, stress, hot weather, and noise) were observed in both studies [23][24]. Another questionnaire survey described the following causative factors for migraine attacks: bad sleep (32.9%), emotional distress (25.7%), intense noise or light (7.1%), and weather conditions (12.9%) [22].

Table 1. The prevalence of trigger factors in pediatric patients with migraine.

References	Study Design	Number of Patients with Migraine	Age (Range) (Years)	Migraine Trigger Factors (%)					
				Stress	Lack of Sleep	Weather Condition	Video Games	Intense Noise or Light	Excitation
Neut D. et al., 2012 [23]	Retrospective Clinical Study	102	7–16	75.5	69.6	68.6	64.7	ND	ND
Solotareff L. et al., 2017 [24]	Prospective Clinic-Based Study	101	5–17	44.6	51.4	41.9	ND	32.4	29.7
Bruni O. et al., 2008 [22]	Retrospective Clinical Study	70	8–15	25.7	32.9	12.9	ND	7.1	ND

ND: not described.

3. Current Insights

To summarize the knowledge, we added a clinician to dispense proper headache education and counsel his patients on behavioral and lifestyle interventions. We reviewed the link between migraine and its common triggers. We assessed the following factors: stress, sleep poverty, and alimentation. To date, there is no concrete evidence that strongly indicates the effectiveness of headache education.

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- Psychiatric, Child Psychiatry, Child Development, Child Health, Child Abuse, Child Neglect, Child Maltreatment, Child Welfare, Child Protection, Child Abuse Prevention, Child Neglect Prevention, Child Maltreatment Prevention, Child Welfare Services, Child Protection Services, Child Abuse Investigation, Child Neglect Investigation, Child Maltreatment Investigation, Child Welfare Services, Child Protection Services, Child Abuse Investigation, Child Neglect Investigation, Child Maltreatment Investigation.

future treatment of newly-onset child and adolescent migraine-implications for disease modification. J. Headache Pain 2009, 10, 227–233.

The association between sleep and migraine is supported by evidence, barring the conundrum of whether sleep is a trigger or an effect of migraine. The assessment and adjustment of sleep habits are always recommended for children suffering from migraines. According to the National Sleep Foundation, the recommended sleep times are 9–12 hours for children (6–12 years) and 8–10 hours for teenagers (13–18 years) [32]. After adjusting the time of sleep and maintaining good sleep hygiene, children with persistent migraines should be screened by polysomnography to identify possible sleep disorders. We conjecture that sleep education plays a significant role in the success of migraine treatment.

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While it is critical to encourage good sleep hygiene and ensure healthy family relationships, a physician should also emphasize the importance of a balanced diet and should not advise more food restrictions than necessary. To prevent migraines affected children and their parents/caretakers must manage stress, sleep, and diet overall following a balanced lifestyle; this is essential for the health of the child. Sleep 2008, 19, 542–548.

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