

# Triggers of Childhood Migraine

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## Abstract

Migraine, a recurring headache that lasts for 1–72 hours with normal physical examination [1]. It is the most common complicated neurological disease of the children characterised by headaches, nausea, vomiting, dizziness, sensitivity to touch, sound, light, and odours associated with/without abdominal pain and mood changes [1]. Some children may have warning symptoms called an aura, before the start of a headache [1]. There have only been five studies published to identify triggers of migraine in children. Our study is non-interventional hospital-based study of healthy patients (< age of 17 years) with migraine over a 5-year period. Our aim was to identify factors that often or almost always trigger an acute attack of migraine. Migraineurs must experience one or more triggers that almost always or often precipitate an attack of headache. Patients with neurological conditions or developmental disorders were not included in this study. Our cohort comprised of 1051 patients. 362 (35%) migraineurs reported at least one factor that triggered an attack of acute migraine. We were able to identify in total 14 different triggers of migraine. Stress, loud noise, bright light, specific diet and climate were reported as the most common triggers of childhood migraine (82%). Chocolate, cheese and eggs were the most common dietary triggers of migraine in our cohort (91%). The number and type of triggers were similar in patient with migraines with aura and migraines without aura. When analysing our findings and available data of migraine triggers, that migraines are triggered by common factors despite different societies, climates and cultures. Childhood migraine can be prevented by considering nutritional supplements, lifestyle alterations and avoidance of migraine triggers, we recommend that enquiry about migraine triggers must be an essential part of headache history.

## Background

Migraine is the most common complicated neurological disease in children with headache and associated with other symptoms [2]. It is estimated that there are 190,000 migraine attacks experienced every day in England [2] and 6 million people suffer from migraine in the UK [2]. Prevalence has been reported to be 5–25% in women and 2–10% in men. Prevalence of chronic migraine in the UK is not known, although some clinicians consider the rate could be 1 in 1000 people [2]. Meta-

analysis of 35 studies showed 7.7% of children and adolescents to suffer migraine [2].

*Migraine* occurs in 3% to 10% of children, and currently affects 50/1000 school-age children in the UK [2] and an estimated 7.8 million children in the EU [2]. *Migraine* affects boys and girls similarly before puberty, but girls are more likely to suffer from *migraine* afterwards [2]. Nearly half of all *children with migraine* never receive a diagnosis [2]. Migraines are triggered by common factors despite different societies, climates and cultures [2]. Currently, there is limited research into triggers of childhood migraine. The aim of this study is to identify trigger in young patients with migraine. There have only been five studies, two in France, two in India and one in Brazil, published to identify triggers of migraine in children [3-7]. Stress and warm climate were reported in all 5 studies [3-7]. TV/computer games and loud noise were reported in four studies in France and India [3-5]. Inadequate sleep was reported as a trigger in France and Brazil [4-7] while missing a meal was reported as trigger in India and Brazil [3,6,7].

There are few hypotheses for the mechanism of action of triggers to induce migraine headache. At a cortical level, migraines can be due to spreading depression [8-10]. Triggers may act by cortical activation projects to the brain [8-10]. Activation of multiple areas in brain, resulting in neurogenic inflammation that activates meningeal nociceptors [8-10]. Activation of cortical neurons lead to the inhibition in periaqueductal grey matter and nucleus raphe magnus [8-10]. Subsequently, these two nuclei release on going descending control of dura matter sensation in the trigeminal nucleus [8-10].

## Material and Method

This is non-interventional hospital-based study of healthy patients (< age of 17 years) with migraine. In prospective period of 5 years from Jan.2015 to Dec. 2019, data was collected from 1051 patients with migraine who attended our headache clinic. Diagnosis of migraine made according to ICHD beta version [11]. Our aim was to identify factors that often or almost always trigger an acute attack of migraine. Trigger was defined as any factor that on exposure leads to an acute attack of migraine. Migraineurs must experience one or more triggers that almost always or often precipitate an attack of headache. We did not inquire further about the duration and/or amount of exposure of trigger that is necessary to precipitate an attack of migraine. We also did not inquire about break down of particular factor

example sunlight from other bright light. Patients were encouraged to talk freely about their headaches. At one point of the consultation, patients were asked if their headache was precipitated by any factor. Patients with neurological conditions or developmental disorders were not included in the study.

## Results

1051 patients attended our headache clinic. In the present study, 362 (35%) migraineurs reported at least one factor that triggered an attack of acute migraine. 689 did not report any triggers. In our cohort, we were able to identify in total 14 different triggers of migraine. Majority of the patients (n=263; 73%) reported one trigger (Table 1). No patients reported more than 3 triggers (Table 1). Stress, loud noise, bright light, specific diet and climate are the most common triggers of childhood migraine (Table 2). Stress, bright light or loud noise triggered migraine in 60% of patients. These patients reported that their migraine occurred more in school days because all the common factors are present in school days. Missing meals, computer games and exercise were less common migraine triggers (Table 2). Chocolate, cheese and eggs were the most common dietary triggers of migraine in our cohort (Table 3). The number and type of triggers were similar in patient with migraines with and without aura (Table 5). However, due to limited data, it would be difficult to comment on the difference in frequency and intensity of migraines caused by the triggers in the patients with migraines with and without aura.

Number of reported triggers	Number of patients
0	689
1	263
2	82
3	17
Total number of patients	1051

**Table 1:** Shows migraineurs reporting specific migraine triggers 33% of migraineurs reported one or more triggers.

Triggers	Number of patients affected
Stress	89
Loud noise	68
Bright light	59
Specific diet	44
Climate	35
Exercise	21
Missing a meal	17
Lack of sleep	15
TV/Computer games	15
Odour	12
Car travel	4
Periods	3

Tiredness	2
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**Table 2:** Shows the type of triggers and the number of patients affected by these triggers. Common factors were reported by 82% of the cohort and included stress, loud noise, bright light, specific diet and climate. Less common factors were reported by 24% of the cohort and included exercise, missing a meal, lack of sleep, TV/Computer games, odour, car travel, periods and tiredness. Patients were allowed to report more than one trigger.

Type of food	Number of patients reporting specific food as trigger for migraine
Chocolate	16
Cheese	14
Egg	10
Citrus fruit	3
Fizzy Drink	1
Indian spices	1
Pineapple	1
Strawberry	1
Potato	1
Garlic	1
Cola	1
Toffee	1

**Table 3:** Shows specific dietary triggers of migraines. Patients are allowed to report more than 1 specific dietary trigger.

	Triggers (n=362)	No triggers (n=689)
Age year (average)	6-17 (11.9)	6-17 (11.9)
Female	204	390
Male	158	299
White Caucasians	207	446
Ethnic minority	155	243
Chronic daily migraine	124	158
Migraine without aura	207	407
Migraine with aura	155	282

**Table 4:** Shows the triggers in sex and ethnicity and migraine with or without aura.

	Migraine with aura 155/437	Migraine without aura 207/614
Trigger number		
1	110	153
2	37	45
3	8	9

Trigger type		
Stress	37	52
Loud noise	31	37
Climate	14	21
Bright light	29	30
Diet	23	21
Others	37	52

**Table 5:** Shows the number and type triggers in the patients of migraine with and without aura.

## Conclusions

When analysing our findings and available data of migraine triggers, there are similar themes, that migraines are triggered by common factors despite different societies, climates and cultures. This raises questions regarding the mechanism of action of triggers. It is important for health workers to identify migraine triggers as education of patients, parents and teachers who would play a major role in migraine prevention. We recommend that enquiry about migraine triggers must be part of headache history. Because drug preventive therapy of migraine, has adverse effects, lack of satisfied responses, poor-compliance, limitations that restrict their use in children, and no specific drug has yet been specifically designed to prevent migraine (12).

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