Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 9s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Headache and Migraine in Patients with Asthma

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Cite this paper as: Abbas Kinbar Kuser, Rasha Kareem Khudhur, Jabbar Jasim Atiyah, Samer Muayed Jawad, (2025) Headache and Migraine in Patients with Asthma. *Journal of Neonatal Surgery*, 14 (9s), 411-416.

ABSTRACT

Objectives: Severe headaches are the hallmark of the migraine condition, which also has systemic and neurological symptoms. This study aims to determine the prevalence of migraine and explore potential associations between migraine, atopic diseases, and parental history in asthmatic patients.

Material And Methods: A total of 72 outpatients with asthma who were diagnosed, according to the hospital database, by an early or late test of reversibility demonstrating a reversible airway obstruction, were included. Questions about the history of asthma, atopic disorders, migraine, and headaches as well as atopic symptoms were asked. The neurology department examined the headacheing individuals and looked into the possibility of migraine. If a patient met the criteria established by the International Headache Society (IHS), a diagnosis of migraine headache was made.

Results: In 60.4% of cases, a headache was mentioned. Three quarters of the patients, had headaches that satisfied the IHS criteria for migraine. Aura-associated migraine affected just 3 people. There were atopic symptoms in 86.8% of individuals. Based on the medical history of the parents, 47.9% had asthma, 39.6% had atopic symptoms, and 22.2% had migraines. It was discovered that patients with atopic symptoms had a noticeably higher frequency of headaches (65.3%) "p=0.007". Patients who had parents who had atopic symptoms had a significantly higher prevalence of migraines (54%) "p=0.002". Gender, smoking, allergens and migraine, and parental history of asthma were found to be independent risk factors for the presence of migraine in asthmatics using multiple logistic regression analysis.

Conclusion: Patients with asthma have a high frequency of migraine headaches. The coexistence of headaches and asthma may be linked to a similar pathophysiological mechanism; smoking, shared genetic components, and family history may all be important components of this mechanism. Clinicians should inquire about atopic symptoms, family history, and headaches in patients with asthma. They should also exercise caution when suspecting migraines.

Keywords: *Asthma, migraine, headache*

1. INTRODUCTION

Pain felt in the head, and occasionally in the neck and upper back, is commonly referred to as a headache. Primary headaches do not have an underlying medical issue, however secondary headaches may develop in conjunction with a variety of ailments or illnesses. The International Headache Society (IHS) has defined the causes of headaches based on etiological criteria and categorized headaches into 14 main classes and several subtypes [1].

The etiology of migraine, a main headache condition marked by intense headaches and associated with neurological and systemic findings, involves neurological, vascular, and hereditary components [2]. The criteria defined by the IHS are used to establish its diagnosis. According to reports, the prevalence is 7-8% in men and 15-18% in women [3].

Asthma and migraine share pathophysiological pathways that are similar [4]. Certain mediators, like interleukin-1 beta (IL-1b) and tumor necrosis factor-alpha (TNF-a), are involved in the development of migraines as well as the pathophysiology of asthma [5].

Inflammation of the nasal mucosa, or allergic rhinitis, is characterized by rhinorrhea, sneezing, nasal congestion, and itching of the nose. Familial atopy is the most significant risk factor for allergic rhinitis. Patients' observable atopic traits are another characteristic shared by migraine and asthma sufferers. Atopy prevalence in migraineurs was found to be similar to that in asthmatic patients in a prior study [6].

Given that allergic illnesses and migraines frequently coexist, it is possible that allergic pathways play a part in the pathophysiology of migraine. The purpose of this study was to find out how common migraine is in people with asthma and how allergic rhinitis symptoms in asthma patients and their families relate to migraine prevalence.

2. MATERIAL AND METHODS

The study comprised 77 asthmatic patients who were from our patient's clinics a 6-month period in 2023.

Patients with a history of extravascular intracranial disease, psychiatric disorders, hypothyroidism (which can cause secondary headaches), cranial or cervical vascular disease, substance abuse, cranial or facial structural impairments and infections, or head or cerebral trauma were excluded. Additionally, individuals using antihistamines and montelukast, which may repress allergy symptoms and result in a false anamnesis, were not included.

Patient sociodemographic information was documented. It was inquired whether patients and their first-degree relatives had asthma or migraines. Answers to questions concerning allergic complaints, including nasal congestion, sneezing, nasal itching, and nasal and post-nasal drainage, were taken from the patients and their first-degree relatives.

The study's asthma participants were questioned about headache presence. Headache patients were directed to the Department of Neurology. Individuals who satisfied the diagnostic standards of IHS were diagnosed with headaches similar to migraines [1]. Patients with migraines were categorized as having migraines with or without auras after the existence of aura was examined in them.

3. RESULT

Patients with asthma were categorized as controlled (49.3%), somewhat controlled (21.6%), and uncontrolled (29.1%) based on disease control. 39.2% of patients smoked, whilst 60.8% of patients did not smoke. 27.8% of patients had additional comorbidities, primarily diabetes mellitus, in addition to the comorbidities listed in the exclusion criteria.

Of the patients, 86.8% had allergic symptoms (nasal itching: 56%, sneezing: 42%, rhinorrhea: 30%, and nasal congestion: 27%).

Following the exclusion of secondary headache causes, 60.4% of patients reported having a headache. There were 32.6% of patients who satisfied the requirements for a migraine diagnosis. There were just three patients with migraine and aura. According to Table 1, the average age of migraine sufferers was 44.3±12.0 years.

Table 1. Details regarding the incidence of migraines and headaches in asthmatic patients

• **Patient characteristics**	• **Number of patients %**
• Presence of headache	• 60 %
• Presence of migraine	• 32 %
• **headache**	
• unilateral	• 33 %
• **Type of pain**	
• throbbing	• 56 %
• compressive	• 42 %
• aura	• 7 %
• Aggravation with physical	• 54 %
• **activity**	
• Nausea-vomiting	• 40 %
• photopsia	• 6.5 %

• Disturb by light and noise	• 40 %
• Visual loss	• 6.9 %

The mean ages of the migraine and non-migraine patient groups did not differ statistically significantly (p=0.918). Although 39% of women and 16.7% of men experienced migraine-like headaches, women were substantially more likely than men to have a primary headache and to be diagnosed with migraine (p<0.001 and p=0.002, respectively). Patients who smoked were found to have a higher prevalence of migraine (p=0.046).

The patients' first-degree relatives reported family histories of migraine, asthma, and allergy symptoms at rates of 22.2%, 39.6%, and 47.9%, respectively. Headache was relatively common (65.3%) in patients with allergy symptoms (p=0.007). Patients with a family history of allergy symptoms had a considerably higher prevalence of migraine (54%) (p=0.002). The existence of familial histories of migraine, asthma, and allergy symptoms was found to be statistically significantly correlated with the complaint of headache [42% (p=0.01), 80.6% (p=0.015), and 71.4% (p=0.038), respectively].

Patients with allergy symptoms were substantially more likely to report of headaches (p=0.007). The occurrence of migraine, allergy symptoms, and asthma in the family was found to be significantly associated with headache in asthma patients (p=0.01, p=0.015, and p=0.038). The rate of migraine was considerably higher (p=0.002) among patients with a family history of allergy symptoms.

The results of a logistic regression analysis showed that among asthma patients, smoking, gender (female), and the existence of a family history of migraine, asthma, or allergy symptoms were independent risk factors for migraine (Table 2).

Table 2. Analysis of independent variables that may be related to migraine using multiple logistic regression

Independent variables	OR odd ratio	P value
Gender female	2.3	0.005 significant
age	1.02	0.26
Allergy + or -	1.11	0.84
Family history of asthma +or-	1.50	0.045 significant
Family history of allergy+or-	5.02	< 0.001 significant
Family history migraine +or-	2.11	0.03 significant
Smoking + or -	6.97	0.002 significant

4. DISCUSSION

One disorder that is frequently identified in asthma patients is headache, which has a detrimental effect on quality of life. Numerous research have looked into the connection between headache and migraine. The "Head Hunt" study's findings indicate that patients with migraine and non-migraine headaches had 1.5 times the frequency of asthma and chronic bronchitis compared to the general population, and that the presence of these conditions was linked to headache frequency [7]. The high frequency of headache in individuals with asthma is indicated by the fact that about 60% of our patients experienced headaches.

According to our research, 32.6% of asthma patients had migraines. A few studies examining the prevalence of migraine have been published in the literature. 5.4% of patients with asthma were found to have a chronic migraine, according to Martin et al. [8]. 16.4% of people (24.6% of females and 8.5% of males) had migraines, according to a Turkish study on the condition's prevalence [9]. This demonstrates that asthma sufferers are more likely than the general population to get migraine-like headaches.

In our investigation, we discovered that females had greater frequencies of primary headache and migraine (2.3 and 1.8 times higher, respectively) than males did. According to additional research, women get migraines two to three times more frequently than men [10]. Consequently, it is important to focus on female asthma patients when it comes to the presence of migraine and to always remember that girls are more likely than males to experience migraines.

There have been suggestions that a same pathophysiological mechanism and familial history may be the cause of the coexistence of asthma, migraine, and headaches, and that shared genetic components may play a part in this common etiology

[11]. It was noted that children whose parents suffered from migraines had an increased chance of developing asthma [12]. It was advised to investigate the existence of headache and migraine in asthma patients with such a familial anamnesis because our study revealed a substantial association between headache and migraine and familial histories of asthma, migraine, and allergy symptoms in asthma patients.

We found in our study that atopic individuals had higher rates of headache and migraine. It is established that allergic illnesses and migraines have a separate relationship [13]. The literature makes clear that there is a close connection between asthma, allergic rhinitis, and migraines, and that part of the reason for this connection is elevated histamine levels [14]. According to a study by Gazerani et al. [15], patients with allergy and migraine had elevated blood histamine and IgE levels. IgE-dependent inflammation specifically affects the nasal mucosa in allergic rhinitis, a chronic illness with both seasonal and perpetual symptoms [16]. These findings point to a metabolic pathway that, in the context of allergies, indicates atopy.

Smoking is known to trigger migraine attacks, but there is not enough information to conclude that smoking increases the chance of developing migraines [17]. According to Chen et al. [18], women with migraines smoked at a higher rate than women without migraines. There has been research on the hypothesis that smokers' lower nitric oxide generation may contribute to an increase in migraine frequency [19]. Our research revealed that smoking was both a migraine trigger and a risk factor, with a greater incidence of migraine among asthma patients who smoke.

A significant constraint on our research was the selection of patients based solely on diagnosed conditions, even though there were numerous other potential causes of secondary-type headaches. The fact that patients were chosen using the hospital's record-keeping system was another drawback. Furthermore, there's a chance that the study into the frequency of patients admitted to the outpatient clinic presented an issue and influenced the outcomes. Another drawback is taking into account subjective complaints that were mentioned orally in the anamnesis, such as headache, allergy symptoms, and familial histories of asthma and migraine. A health committee report states that objective criteria, like blood IgE levels and the skin prick test, can yield better results when used to determine whether allergic rhinitis is present.

5. CONCLUSION

In conclusion, asthmatic people frequently have migraines. It has been proposed that a same pathophysiological mechanism underlies the coexistence of headache and asthma. In addition, smoking, shared genetic components, and family history may contribute to this cohabitation. Atopic individuals may experience headache and migraine more frequently. As a result, when treating asthma patients, it's important to remember the following: a complete examination of the headache complaint, a questioning of the patient's family history and allergy symptoms during anamnesis, and a careful consideration of the possibility of migraines.

Appendix 1a: Diagnostic criteria for migraine without aura (1)

A. At least five attacks including B–D items
B. Headache lasting for 4–72 h
C. Headache having at least two of the following characteristics
    1. Unilateral location
    2. Pulsating quality
    3. Moderate or severe pain intensity
    4. Aggravation by routine physical activity (walking, etc.)
D. During headache, at least one of the following
    1. Nausea and/or vomiting
    2. Photophobia and phonophobia
E. Headache not attributed to another disorder

Appendix 1b: Diagnostic criteria for migraine with aura (1)

A. At least two attacks including B–D items
B. Aura including at least one of the following, but not motor weakness:
    1. Reversible visual symptoms with positive or negative features
    2. Reversible sensory symptoms with positive or negative features
    3. Fully reversible dysphasic speech disturbance
C. At least two of the following:

1. Homonymous visual symptoms and/or unilateral sensory symptoms
2. Aura symptoms develop in approximately 5 min, and different aura symptoms develop at 5-min intervals.
3. Each symptom lasts for ≥5 and ≤60 min.

D. Headache beginning during aura or following aura within 60 min and fulfilling the criteria for migraine without aura

E. Headache not attributed to another disorder

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