

Pediatric Headache: A Single Center Experience

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Keywords: Pediatric headache, migraine, tension-type headache, secondary headache, red flags

Introduction

Headaches, which are one of the most frequent causes of admission to pediatric neurology clinics, are rarely associated with a serious medical condition and have been classified as primary and secondary headaches by the International Headache Association (1) The third subset includes neuropathies, facial pain and other headaches.

Primary pediatric headache disorders include migraines, migraine variants, tension-type headaches, and the trigeminal autonomic cephalalgias. Several etiologies have been defined for secondary headaches in children. The International Classification of Headache Disorders, 3rd Edition (ICHD-3), broadly categorizes secondary headaches into the following: headaches due to trauma, headaches due to cranial or cervical vascular disorders, headaches attributable to nonvascular intracranial disorders, headaches attributable to substance abuse or withdrawal, headaches due to infection, headaches due to disorders of homeostasis, headaches/facial pain due to disorders of the head or facial structures, and headaches due to psychiatric disorders. Considering the general diagnostic criteria for a secondary headache, the temporal relationship between headache onset and the presumed cause should be defined. Specifically, the headache should worsen in relation to the underlying cause and/or improve with treatment or resolution of the presumed cause and have characteristics typical for the disorder (1).

The existence of a secondary cause needs to be ruled out in children and adolescents by using physical examination and laboratory techniques. Using a bundle which consists of blood tests and cranial imaging in every patient with a headache due to medicolegal concerns causes loss of resources and time. In addition, false positive test results and incidental findings increase medical cost and time loss. For this reason, it is necessary to increase the experience of clinicians with studies conducted in pediatric patient populations presenting with a headache.

Material and Methods

This retrospective, descriptive, single-center study was conducted at the department of Pediatric Neurology of Muğla Sıtkı Koçman Research and Training Hospital, Muğla, Turkey. One hundred sixty (n:160) children (93 boys and 67 girls) between 6 and 18 years of age who were admitted to the pediatric neurology clinic with a headache between June 2018 – June 2019 were evaluated for the study.

A participant was excluded if he or she or a parent: 1) was unwilling to participate in this study, 2) had incomplete hospital records.

In our clinic, headaches are classified according to the International Classification of Headache Disorders proposed by the Committee of the International Headache Society, 2017 (IHS) (1). Classification of the patients were made by type of primary headaches (migraine, tension-type, cluster and other), etiology of secondary headaches (attributable to trauma or injury to the head or neck, cranial or cervical vascular disorders, sudden drug cessation or withdrawal, infections,

disorders of homeostasis or headache or facial pain attributable to other facial and cervical structures). Also, age, gender, patient and family medical history, initial headache such as duration, location, duration of episodes, cranial MRI and EEG findings (if applied) were recorded.

Cranial MRI results were classified as normal or abnormal. EEGs were classified as normal or epileptic abnormalities

Twenty red flags were evaluated if asked or recorded; systemic symptoms, history of neoplasm, neurologic deficit or dysfunction, sudden or abrupt onset, pattern change or recent onset of headache, positional headache, precipitated by sneezing, coughing, exercise, or Valsalva maneuver, papilledema, vomiting, progressive headache, painful eye with autonomic features, posttraumatic onset of headache, immunocompromised child or adolescent, painkiller overuse or new drug at onset of headache, onset under 3 years old, atypical presentation, comorbid seizures, consistently worse in the morning, existence of a visual aura, headache awakening from sleep at night (2,3).

Statistical Analyses

Data analyses were performed by using SPSS for Windows, version 22.0 (SPSS Inc., Chicago, IL, United States). Kolmogorov-Smirnov test was used to determine whether the distribution of continuous variables was normal or not. Levene's test was used for the evaluation of homogeneity of variances. Continuous data were described as mean \pm SD. Categorical data were described as number of cases (%).

Results

A total of 160 children and adolescents (93 boys, 58.1 %) were included in the study. Ninety-three (58.1 %) had primary and 67 (41,9 %) patients had secondary headache. The average age of the patients with a primary and secondary headache was $141,5 \pm 38,3$ and $115,1 \pm 38,8$ months, respectively (p: 0,018). Family history for primary headache was positive in 36.3 % (n:58) of the patients. Family history for primary headache was positive in 53,7 % (n:50) of the primary headache group and 11,9 % (n:8) of the secondary headache group (p<0,001).

All the patients were admitted to the hospital within the first three years from the onset of symptoms. 25 % (n:40) of total were admitted to the hospital in the first month from the onset of symptoms. 10,6 % of all the patients (n:17) were admitted initially to the emergency service. Episodic headaches (50 %) are the most frequent type of headaches. Three (1,9 %) patients had chronic progressive, 36 patients (22.5 %) had acute (with a duration of less than a month) while 41 (25,6 %) patients had chronic non-progressive headaches.

Forty-eight percent (n:78) of the 93 (58,1%) patients who were diagnosed with a primary headache had tension type headaches. Migraine was detected in 71 (23,1%) of the patients. Only 3 (1,9%) patients had chronic daily headaches.

Secondary headaches were found in 41,9% of the patients and 80% (n:31) of these had infectious causes which could be treated with antibiotics. Rhinosinusitis was the most frequent cause in this group (n:22). Two (1,3%) of the patients had a secondary headache attributable to nonvascular intracranial disorders (one neurofibromatosis and one hydrocephalus secondary to a intracranial mass). 1 patient had a toothache and one patient had bruxism which means 1,3% of the patients had a headache attributable to head, neck and other facial structures. A pediatric psychiatry consult was deemed necessary for 7 (4,4%) patients and the headache was attributed to psychiatric reasons.

Red flags which indicate secondary headaches were present in 7,4% (n:12) of all patients however, 6 of these patients were diagnosed with a primary headache. Ten of 12 patients with red flags had more than one red flag. As a result, 12 patients had a sudden or abrupt onset (duration less than a month), 8 patients had vomiting, 6 patients had systemic symptoms (fever,

weight loss, sweating), 4 patients had a headache awakening from sleep, 3 patients had a pattern change or recent onset of headache, 3 patients had progressive headaches, 3 patients had atypical presentations, 2 patients were consistently worse in the morning, 1 patient had neurologic deficits or dysfunction (abnormal neurologic examination findings including movement disorders, decreased consciousness and confusion), 1 patient had a positional headache, 1 patient had a headache which was precipitated by sneezing, coughing, exercise or Valsalva maneuver and 1 patient had papilledema. Headache localization was as follows: 50,6% (n:81) frontal, 7,5% (n:12) occipital, 7,5% (n:12) frontotemporal, 15,6% (n:25) not localized. No distinct localization could be defined in 30 patients. 6 patients in the primary headache group and 6 patients in the secondary headache group had at least 1 red flag.

Cranial MR imaging was performed in 26,3% (n:42) of the patients and was found to be within normal limits in half of the patients. The most frequent pathologic finding in the cranial MR imaging was rhinosinusitis with various localizations (n:21). One patient was diagnosed with neurofibromatosis and one patient was diagnosed with an intracranial mass as a result of cranial MR imaging.

Epileptic activity was detected in the EEG 2 of 31 patients with episodic, atypically presenting headaches accompanied with auras, who were diagnosed with childhood epilepsy.

Discussion

Headache is a common neurological disorder seen in pediatric patients and can have both primary and secondary etiologies. Diagnosis, management and treatment of headaches have been defined by international protocols and clinicians need to evaluate clinical features in order to detect pathologies which require urgent treatment.

Headaches are a major health concern in the United States in both adult and pediatric patients. The median age of onset is 7,5 years [1,2], and it is estimated that by 15 years of age, 57–82% of children will have had a headache of any type (4). In school-age children, boys tend to be more affected than girls, whereas there is a female preponderance after the onset of puberty (5). The number of boys who were admitted with a headache was greater than the number of girls in our study group where average age was 14,2.

Primary headaches, as expected, were more frequent than secondary headaches. Tension headaches were observed in 48,8% (n:78) of the 93 (58,1%) patients who were diagnosed with a primary headache. The incidence of migraine was lower (23,1%, n:37). No patients were diagnosed with TCA. This distribution is concordant with the literature (4,5).

Various causes have been detected as etiologies of secondary headaches and 80% (n:31) were infectious causes which could be treated with antibiotics. However, contrary to the literature, life threatening intracranial pathologies were detected only 1,9% of the cases.

There was no statistically significant difference concerning the number of red flags indicating intracranial pathologies requiring urgent treatment between the primary and secondary headache groups. Six patients in the primary headache group and 6 patients in the secondary headache group had at least one red flag. This indicates that there was no correlation between the number of red flags and the severity of the clinical situation.

Neuroimaging was performed for approximately ¼ of the group and rhinosinusitis was detected in half of these patients. Epileptic activity in EEG was observed and a diagnosis of epilepsy was made in two of the 160 patients who were admitted with headaches.

Headaches are more frequent than believed or reported where clinicians can easily estimate the type using history and physical examination and can plan advanced laboratory tests in the presence of red flags. Our study aims to present demographic and clinical features of children and adolescents who were admitted to a single center with headaches in a one-year period and thus enrich the literature on this frequently observed symptom.

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