

Evaluation of headache in children: a retrospective study

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ABSTRACT

Objectives: Headache is a very common symptom that can be seen in the children. It can be seen due to primary or secondary causes. Migraine and tension-type headache are the most commonly seen primary headache types in children. In this study, we retrospectively evaluate etiologic and clinical features of the 228 patients. **Methods:** In this study, clinical features and neuro-imaging characteristics of the patients, who admitted Eskisehir Osmangazi University pediatric neurology department between 2007 and 2011 were evaluated retrospectively. Headache classification was made according to "International Headache Society" criteria. **Results:** The ages of the patients ranged from 4 to 18 years (average 12.9±3.1). There were 136 (59.6 %) girls, and 92 (40.4%) boys. The most frequent causes of the headache were migraine (37.3%) and tension type headache (25%). There were other associating diseases at 54 (23.7%) patients. Allergic rhinitis and asthma bronchilitis were the most commonly associated diseases. Abnormalities were encountered in 3 (6.8%) of the 44 (19.3%) patients taken computerized brain tomography, 18 (20.2%) of the 89 (39%) patients taken magnetic resonance imaging and 8 (3.5%) of the 77 (33.8%) patients taken electroencephalography. No serious problem is established in patients undergoing neuro-imaging. **Conclusions:** In this study, it was seen that migraine and tension-type headache are the most frequently seen causes of the headache in the children. It is concluded that unnecessary neuroimaging examination should be avoided by detailed anamnesis and neurologic examination of children that admitted hospital with headache complaint.

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Introduction

As in adults, headache is the frequent complaint of children and adolescences that admitted to clinics and emergency rooms and also to neurology clinics. Whereas families think headache is rarely seen at children, so they especially concern brain tumor [1]. Headache frequency increases with aging. Headache frequency is determined as 46.2% in Isyk *et al.*'s epidemiologic study made with 2669 children aged between 5-13 years [2].

Headache can be seen due to primary and secondary causes. Headaches can be due to a simple infection as well, though rarely due to intracerebral hemorrhage or meningitis or a brain tumor. Migraine and tension type headache are the most frequently seen primary headache types at children. Since the age of the child will affect the headache statement of child; frequency, diagnosis and treatment of headache may be different in each age group. The patient admitting with headache must be evaluated detailed. Medical history plays important role to rule out secondary causes. Taking good anamnéza, detailed physical and neurological examination and headache diary are the important and critical steps for diagnosis and treatment [3,4].

In this study 228 patients aged 4-18 years of age are evaluated retrospectively with the etiologic, clinical and neuroimaging findings between 2007-2011.

Methods

Two hundreds and twenty-eight patients aged 4-18 years of age are evaluated retrospectively with the etiologic, clinical and neuroimaging findings between 2007-2011 that admitted Eskisehir Osmangazi University Medical Faculty pediatric neurology department for headache complaint. Frequency, duration, location, lateralization of headache, presence of triggering factor, associated symptoms, presence of treatment for sinusitis, transmission of any other diseases, family history of headache/migraine, neurologic examination findings are recorded. Neuroimaging findings are evaluated. Headache classification is made according to "International Headache Society" criteria [5].

Results

Patients aged between 4-18 (median 12.9 ± 3.1), 136 (59.6%) of them are female, 92 (40.4%) of them are male, 228 patients in total are retrospectively evaluated. Female to male ratio was 1.48. In about three-quarters of patients with headache it was ongoing for more than 6 months. Headache duration, frequency, localization, attack duration, causes of headache and classification are shown at Table 1.

Headache in 133 patients (58.3%) passed with painkillers, 95 (41.7%) had no response. 89 patients (39%) had a history of getting sinusitis treatment due to headache. Blood pressure values of all other patients except one patient were normal. Neurological examination findings for all patients except for patients having meningitis diagnosis and neurodevelopmental delay was natural. 3 patients having Pseudotumor cerebri diagnosis had papilledema. In 4 patients having Meningitis and pseudotumor diagnosis, lumbar puncture was performed.

The most frequent cause of the headache is migraine (37.3%) and tension type headache (25%). 39 (68.4%) of 57 patients having tension type headache diagnosis were female. Headache was bilateral at 51 (89.5%) of the patients. There was family history at 18 (31.5%) of patients that had tension type headache. 44 (51.8%) of 85 patients with migraine were female, 41 (48.2%) were male, female to male ratio was 1.07. Headache was bilateral at 64 (75.3%) of the patients while 21 (24.7%) of the patients was unilateral. 81 (95.3%) of the patients had migraine without aura, the rest 4 (4.7%) had migraine with aura, 3 of them with visual findings, one of them had parestesias. Noise and stress were the most seen triggering factors at 41 (48.2%) of the patients. The other triggering factors were fatigue, sleeplessness, odor, menstruation, reading a book, taking bath, coffee, computer, and watching television. In 62 patients (72.9%), most commonly nausea, vomiting, and photophobia as visual finding and paresthesia, vertigo, wetting of the eyes and phonophobia as associating symptoms of migraine were seen. 52

(61.2%) patients had a family headache history, including migraine in 35 (41,2%) patients.

Fourteen (6.1%) of 24(10.5%) patients that their headache was evaluated as psychological has major depression and common anxiety disorder diagnosis at child psychiatry clinics. There was an associated disease at 41(18%) of the patients. Most commonly associated diseases are allergic rhinitis and asthma

bronchitis whereas the other ones are obesity, goitre and attention deficit hyperactivity disorder.

Neuroimaging was done in 133 (58.3%) patients. In 112 (84.2%) out of 133 patients, no abnormal finding was reported. There were abnormal findings in three (6.8%) of 44 patients with CT imaging and 18 (20.2%) of 89 patients performed MRI. Neuroimaging findings are seen in Table 2.

Table 1. Features, causes and classification of the headache

	Patients (n=228)	%
Duration of the headache		
<7 days	10	4.4
<8 days- 1 month	28	12.3
1-5 month	28	12.3
6-12 month	100	43.9
1-3 years	34	14.9
3-6 years	13	5.7
?6 years	15	6.6
Headache frequency		
Every day	75	32.9
More than once per week	91	39.9
More than once per month	52	22.8
Every two-three months	10	4.4
Duration of headache attack		
<30 minutes	32	14
30-60 minutes	26	11.4
1-4 hours	114	50
4-24 hours	48	21.1
?24 hours	8	3.5
Lateralization of headache		
Bilateral	188	82.5
One sided	39	17.1
Variable	1	0.4
Location of the headache		
All over head	87	38.2
Forehead	64	28
Temple	48	21.1
Nape ache	17	7.5
Eye	7	3
Vertex	5	2.2
Causes		
Primary headache		
Migraine	85	37.3
Tension type headache	57	25
Secondary headache		
Sinusitis	31	13.6
Pshchologic	24	10.6
Visual abnormality	10	4.4
Trauma	6	2.6
Structural disorder of the neck and eye	6	2.6
Pseudotumor cerebri	3	1.3
Upper airway infection	2	0.9
Otitis	2	0.9
Menengitis	1	0.4
Hypertension	1	0.4

Table 2. Neuroimaging findings of the patient

Neuroimaging findings	Patients	%
Brain CT		
Retention cyst at maxillary sinus	2	0.9
Arachnoid cyst	1	0.4
Brain MRI		
Nonspecific hyperintensities	6	2.6
Arachnoid cyst	5	2.2
Periventricular leucomalacia	3	1.3
Retention cyst at maxillary sinus	3	1.3
Arnold Chiari Type I	1	0.4

Discussion

Headache is one of the frequent symptom seen at childhood. The incidence has been increasing in recent years. In Finland while the frequency of headache at 7 years old children was 14 % in 1974, it was reported as 52 % in 1992. Migraine frequency increased from 1.9 % to 5.7 % [6]. A study made at Turkey between the years 1993-1998 showed that 4.33 % of the patients admitted to clinics with headache complaint [7]. The incidence of the headache has peak value at ages of 12-14 years and headache is seen more frequently at girls [8]. In this study the average ages of the patients were 12.9 ± 3.1 and female to male ratio was 1.47. The most frequent causes of the headache was migraine (37.3%) and tension type headache (25%). Alehan's study revealed that migraine (44.2%) and tension type headache (31.5%) were the most common causes of headache [9]. Migraine is the important cause of headache that negatively influences the life quality of the child. While it is more frequent at males in prepubertal period, at females it is frequently seen in adolescence. Migraine frequency increases with age and it is reported as 3.9% at ages 7-15 [10]. Tension type headache is the second most frequent cause of headache other than migraine [9].

Most common form of migraine at children and adolescences is migraine without aura (60-85%).

Doing homework, fatigue, stress, hunger, bright lights, infections, some food (cheese, chocolate, drinks with cafeine) may trigger headache attacks. Autonomic findings (nausea, vomiting, photophobia, phonophobia) may associate to the pain. Visual symptoms (brighth light, scotoma, blurred vision), auditory and odor hallucinations, motor symptoms (speech disorder, hemiplegia) and autonomic disturbances may be seen at migraine with aura [11]. In this study 95.3% of the patients with migraine without aura whereas 4.7% of them had migraine with aura. Nausea-vomitting, photophobia were the most commonly seen associated symptoms. There was triggering factors where most common ones are stress and noise at almost 50% of the patients. There was family history of headache at 61.2% of the patients with migraine and at 31.5% of the patients with tension type headache. In the study that Alp et al. had made on children that migraine was seen more frequently in females than males (1.45), where 34.4 % had aura and visual and auditory aura were the most frequent ones. Also in this study 84.8% of the patients with migraine and 69.7% of the patients with tension type headache had family history of headache [12].

Headache may associate the underlying disease at children. At France, in a study made with children, it was reported that 43.2% of patients had other

diseases such as psychologic disturbances, gastrointestinal diseases, hyperactivity, epilepsy, endocrine, dermatologic, hematologic diseases including most common allergy and asthma [4]. In this study there was associated diseases at 23.7% of the patients. The other associated diseases were obesity, epilepsy, goitre, deficit attention and hyperactivity including most common allergic rhinitis and asthma. Fouteen patients diagnosed as major depression and common anxiety disorder. Neuroimaging is not necessary at the patients with normal neurologic examination and long lasting repeating headache. If the patient has abnormal neurologic examination or has convulsions or newly started severe headache, cranial MRI that is more sensitive in showing structural defects should be preferred [10]. In this study 58.3 % of the patients had underwent neuroimaging. Neuroimaging findings were normal at 86.4% of the patients. Non spesific hyperintensities, arachnoid cysts, periventricular leukomalacia, Arnold Chiari type 1 malformation, maxillary sinus retention cyst were abnormal neuroimaging findings seen at 15.8% of the patients. Serious neuroimaging findings like brain tumor are rarely detected at childhood headaches, 20% of the patients are reported to have sinusitis, Chiari type 1 malformation, nonspesific white matter hyperintensities, venous angiomas, arachnoid cysts, pineal cysts, cerebral malformations like mega sisterna [13,14].

Conclusions

In this study, migraine and tension type headache are found to be the most frequent causes for headaches seen in children. In patients where neuroimaging was done, no serious underlying reason was found. It is concluded that unnecessary neuroimaging examination should be avoided by detailed anamnesis and neurologic examination of children that admit hospital with headache complaint.

Conflict of interest

The authors disclosed no conflict of interest during the preparation or publication of this manuscript.

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