RESEARCH BRIEF

Recurrent Headache in Pediatric Outpatients at a Public Hospital in Delhi

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This observational, descriptive study was conducted to study the clinical profile of children presenting with recurrent headaches to the general pediatric services of a tertiary-care, public hospital in northern India. 43 children, 3-18 year old (23 females, median age 10 years), were enrolled between April, 2011 to January, 2012. History, clinical examination (including fundus evaluation and detailed ophthalmological evaluation) and follow-up were done using a structured proforma. Headache diagnosis was made on the basis of International Classification of Headache Disorders, 2nd edition (ICHD-II). Headache disability and severity were assessed by pedMIDAS, and Visual analog scale and Faces scale, respectively. 26 patients (60.5%) had headache with migraine features (20, migraine without aura), 11 (25.6%) had Tension type headache (TTH), and 4 (9.3%) children had non-specific headache. Stress was the commonest (42.3%) trigger identified by children with migraine. No patient in the study had an ophthalmological problem as cause of headache. 69.2% of migraine patients and 36% of TTH patients had been suffering from it for 1-2 years before reporting to the hospital. Majority of children with recurrent headache present late for medical attention. Ophthalmological problems are an infrequent cause of recurrent headache in these children.

Keywords: *Child, Headache, India, Migraine, Tension type headache.*

Headache is the most prevalent neurological symptom worldwide. The reported prevalence of primary headache is 10-20% in school-aged children [1,2] and >50% in those under-20 [3]. Data on pediatric headache in India are limited to a few school-based questionnaire surveys [1,2], or case series of specific primary-headaches [4], or are isolated case-reports of rare headache types [5]. In addition to the population-prevalence of a disorder, the clinician is also interested in the profile of the patients presenting for medical care. We, therefore, studied children presenting with recurrent headaches to the general pediatric services of a tertiary-care, public hospital in northern India.

METHODS

This cross-sectional study was conducted at the Department of Pediatrics of our institution, a general-hospital in New Delhi, for a 10-month period from April 2011 to January 2012. Ethical clearance was taken from the Institutional Ethical Committee, and informed written consent taken from parents of the study subjects. Assent was taken from all children above six years. All children between 3 to 18 years of age attending the Pediatrics department with recurrent headache were included in the study. Recurrent headache was defined as more than three headache episodes in the previous 12 months. Children presenting with headache due to fever, trauma and/or other obvious causes like meningitis, dental conditions, sinusitis etc. were excluded. All children were evaluated as per standard guidelines [6].

Data collection: A pre-tested structured proforma was developed to collect details of the patients. Complete general physical examination and systemic examination (including detailed neurological examination and fundus examination) was done for all patients.

The diagnosis of various headache subtypes was made according to the International Classification of Headache Disorders 2 (ICHD II) criteria of International Headache Society (IHS) [7]. PedMIDAS score was used to assess the disability due to headache in the previous three months [8]. A pre-tested, Headache diary in *Hindi* was provided to each patient and reviewed at a follow-up visit, usually after four weeks. Assessment of pain severity was objectively assessed by using Visual analogue scale (VAS) for children older than six years of age [9], and Faces scale for three to six years old children [10]; which were scored at home during the next headache episode.

Complete ophthalmological evaluation (refraction,

orthoptic testing, intraocular pressure and retinal examination) was done by a single ophthalmologist for all the study children. Spectacle correction was given where indicated, and the effect of correction was noted on various headache parameters after three months.

Patients were requested to follow-up after every one month to see the changes in the headache severity on above mentioned scales, and disability assessment was done. Those who missed the follow up visits were reminded telephonically, and follow-up visit rescheduled. All patients completed at least two follow-up visits.

RESULTS

Forty-three children (median age (range), 10 (3-17) years) were included in the study. Migraine was diagnosed in 26 (60.4%) children, of which 50% were males. These included migraine without aura (20, 76.9%), probable migraine (5, 19.2%), and one child with migraine with aura. Eleven children (25.6%) were diagnosed with tension type headache (TTH), including frequent episodic TTH (4, 36.4%), infrequent episodic TTH (6, 54.5%), and one child with probable TTH. Four (9.3%) children had non-specific headache. One case each of Headache attributed to ischemic stroke (ICHD-II code 6.1.1) and Post-seizure headache (ICHD-II code 7.6.2) was noted. The various clinical characteristics of the patients are shown in ***Table* I.** 42.3% of the migraine sufferers reported stress (both physical and emotional) as the triggering event. 23% of migraine patients had a first degree relative with history of migraine-like headaches.

Ophthalmological evaluation was within normal limits for all children, except for two. One child was diagnosed with 'refractive error in both eyes' and was prescribed spectacles, the other was already a user of refractive correction in the form of myopic spectacles. At the end of three months of follow up, frequency and character of headache was unaltered in these two children, thereby negating refractive error as a probable cause of the recurrent headaches.

Majority of children with recurrent headaches (32, 74.4%) had consulted a doctor for the first time only after 1 to 3 years (median 15 month) of recurrent headache episodes. All had been taking Complementary and Alternative medications and/or Over-the-Counter (OTC) medications (***Table* II**).

TABLE I CHARACTERISTICS OF THE STUDY CHILDREN (*N*=43)

Characteristics	*Migraine (n=26) No. (%)*	*TTH (n=11) No. (%)*	*Others (n=6) No. (%)*
Age at presentation			
<6 y	3 (11.54)	1 (9.09)	0
6-10 y	10 (38.46)	5 (45.45)	6 (100)
>10 y	13 (50)	5 (45.45)	0
Location			
Frontal	9 (34.6)	2 (18.2)	3 (50)
Temporal	10 (38.5)	1 (9.1)	1 (16.7)
Occipital	1 (3.8)	3 (27.3)	0
Diffuse	6 (23.1)	5 (45.4)	2 (33.3)
Character			
Throbbing/pulsatile	20 (76.9)	0	0
Band-like/tightening	1 (3.8)	9 (81.8)	0
Undefined	5 (19.2)	2 (18.2)	5 (83.3)
Sharp	0	0	1 (16.7)
Duration-typical episode			
< 1 hr	4 (15.4)	3 (27.27)	3 (50)
1-2 hr	0	5 (45.4)	3 (50)
>2 hr	22 (84.6)	3 (27.3)	0
Frequency			
Daily	5 (19.2)	1 (9.1)	4 (66.7)
Weekly	5 (19.2)	1 (9.1)	1 (16.7)
Monthly	5 (19.2)	3 (27.3)	1 (16.7)
2-3 monthly	3 (11.5)	3 (27.3)	0
Others	8 (37.9)	3 (27.3)	0
Disability (n=41)#*			
No disability (0-10)	1 (4)	2 (20)	1 (16.2)
Mild (11-30)	16 (64)	6 (60)	0
Moderate (31-50)	8 (32)	2 (20)	5 (83.3)
Severe (>50)	0	0	0
*Severity (n=42)^*			
<3	1 (3.8)	2 (18.2)	0
3-5	10 (38.5)	3 (27.3)	0
6-8	13 (53.8)	6 (54.5)	1 (16.7)
9-10	1 (3.8)	0	5 (83.3)

** Disability assessed using PedMIDAS scores; # One patient each with migraine and TTH did not complete the pedMIDAS evaluation; ^one child did not provide data for the same.*

DISCUSSION

In this cross-sectional study of 43 children (55.8% males) attending a general hospital for recurrent headaches, 21 (48.8%) children had migraine, and 11 (25.6%) had TTH.

The proportion of children with migraine among those with recurrent headaches was similar to a previous school-based study from the same city (51.7%)[1], and other places in India (63.6%)[2]. No pediatric, hospital-based studies from India are available, although such studies from Western countries also report similar

TABLE II TREATMENT GAP IN STUDY CHILDREN NO. (%).

	Migraine (n=26)	*TTH (n=11)*	*Others (n=6)*
*Duration of Headache**			
<6 month	2 (7.7)	2 (18.2)	1 (16.6)
6 month-1 year	2 (7.7)	3 (27.3)	1 (16.6)
1-2 year	18 (69.2)	4(36.4)	0
>2 year	4 (15.4)	2 (18.2)	4 (66.7)
Previous management#			
Self-medication^	18 (69.2)	7 (63.63)	5 (83.3)
Prescribed by physician	4 (15.4)	2 (18.2)	0
No medication taken	4 (15.4)	2 (18.2)	1 (16.7)

*TTH-Tension type headache, *Prior to first medical consultation; #Prior to present consultation;^Complementary and Alternative medication/Over-the-Counter drugs.*

findings (54%) [11]. Proportion of TTH was much less than migraine, which is similar to previous studies [1-3]. However, a previous study reporting on the profile of pediatric headache population at a headache clinic (*n*=609, 53% boys) in UK, found the proportion of TTH (38.9%) to be higher than migraine (30.3%)[12]. The differences could well be due to the difference in the study population, as the patients reported were from a 'headache clinic' [12] as against our data from the pediatrics outpatient department of a general hospital. We found non-specific headache in 4 (9.3%) children, which is somewhat similar to 4.8%-12.3% reported previously [12,13].

Four of the five cases of probable migraine in our study did not have the required duration of headache attack as per ICHD2 (at least two hours), mostly having headache lasting 15- 30 minutes in all these cases. Aruda, *et al*. [14] reported that majority (76%) of the cases of PM in their study failed to receive a migraine diagnosis based on missing the duration criteria (untreated headaches lasting <1 hour). In the Aberdeen school-based study [13], 10 (5%) children with recurrent headache did not fulfill the duration criteria for migraine diagnosis. There was a family history of recurrent migraine-like headache in first degree relatives of a quarter of migraine patients and a third of TTH patients in this study. A higher prevalence rate of headache and migraine among the first degree relatives of children with migraine than among controls has been shown previously also [13,15].

Majority of the patients had waited for 1 to 3 years after onset of headache to seek medical attention. The commonest reason given for this delayed health-seeking behavior was absence of significant morbidity. PedMIDAS scores in our study also support this explanation, as no patient was falling in severe disability (>50 score). Five patients were living in rural areas where medical facilities were far-flung, causing delay in seeking medical help. These findings corroborated the previously suggested barriers to headache care in India [16]. A recent Italian study on delayed diagnosis in pediatric headache reported median time from the onset of the first episode of recurrent headache to definite diagnosis was 20 months [17]. However, these patients had previously received medical care for headache, in contrast to our patients coming to medical attention for the first time.

Despite the apparent belief of many medical professionals that provision of an appropriate correction may alleviate various types of headache, the relationship between minor refractive errors and headache lacks any conclusive evidence [18]. In this study also, ophthalmological problems were not found to be a cause for recurrent headache in any child; reasserting that minor errors of refraction only rarely cause a significant headache problem [19]. Errors of refraction and headache are both common problems in children, and their co-existence in the same patient is not unusual [12]. In fact, the ICHD2 provides a specific category of Headache associated with refractive errors [7]; however, this is a rare entity [20].

One of the major strengths of the study was the 100% follow-up of all the enrolled patients. Patients and parents were interviewed by a single trained physician in a one-to-one setting, and a single ophthalmologist evaluated all children. A major limitation of the current study is a convenience sample, which makes generalizations difficult. Moreover, only patients attending the pediatric department were enrolled, thereby missing many patients attending Medicine or Neurology departments. This may be one of the reasons that we did not have any children with other primary headache disorders.

To conclude, our observations suggest that the profile of recurrent headache in Indian children presenting to the hospital is similar to reports from other countries, with some important differences related to treatment gap and disability. More hospital and community-based data is required from India to accurately describe the clinical profile and burden of pediatric headache.

Contributors: AS evaluated and managed all the patients under the guidance of DM and MJ, conducted the literature search, and prepared the initial draft of the manuscript. DM conceived the study, formulated the study protocol, prepared the final manuscript, and will be the guarantor. MJ provided important intellectual inputs. KS conducted the ophthalmological evaluation and provided important intellectual inputs in the manuscript. All authors approved the final manuscript to be submitted.

WHAT THIS STUDY ADDS?

- Majority of children with recurrent headache present after suffering from headache for a long duration.
- Ophthalmological causes of headache are infrequent among children with recurrent headache.

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