

## Migraine and Tension-Type Headache in Children and Adolescents Presenting to Neurology Clinics

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### Abstract

**Objective:** Headache is one of the most common neurologic problems in children and adolescents. Primary headache including migraine and tension-type headache comprises the vast majority of headaches and are associated with marked incidence, prevalence, and individual and social cost. We aimed to assess demographic characteristics and to compare some factors related to primary headaches in children/adolescents presented to neurology clinics of Tabriz University of Medical Sciences.

**Methods:** Children from 4 to 15 years of age with the diagnosis of primary headache (migraine or tension-type headaches) who presented to the neurology clinics affiliated to Tabriz University of Medical Sciences, Tabriz, Iran from March 2009 to October 2011 are included in this cross-sectional study. Data regarding the type of headache, history of atopy, peripartum asphyxia, and breast feeding, family history of headache and the socioeconomic status of the family were collected. The diagnosis was based on the international headache society diagnostic criteria for the primary headache disorders.

**Findings:** One hundred ninety children (107 females) with primary headache (88 patients with migraine and 102 patients with tension type headache) enrolled in the study. Peripartum asphyxia, history of atopy, family history of headache and low socioeconomic status (SES) were more common in patients with migraine (*P*-values: 0.007, 0.01, 0.001, 0.003; respectively).

**Conclusion:** Physicians need to extent their knowledge regarding the primary headaches. Peripartum asphyxia, history of atopy, headache in parents and low SES have been shown in the present study to be more prevalent in patients with migraine as compared to tension-type headache.

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**Key Words:** Asphyxia; Atopy; Children; Migraine; Tension-Type Headache

### Introduction

Headache is one of the most common neurologic complaints in children and adolescents. It negatively influences the child's quality of life and is an important cause of absence from school and also a significant factor in health-related costs among children and adolescents<sup>[1]</sup>. Its prevalence

varies greatly from 5.9 to 82%, depending on the definition criteria and the age of the patients<sup>[2-5]</sup>. The International Headache Society classifies headaches into primary and secondary type in classification of headache disorders 2<sup>nd</sup> edition (ICHD-II)<sup>[6]</sup>. Primary headache is not attributed to any other disorder. In the majority of patients with primary headache, general and neurological

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examinations are normal and no clear underlying cause is evident<sup>[3,7]</sup>. Primary headaches include migraine, tension-type headache, cluster headache, autonomic cephalalgias and other primary headache disorders. Secondary headache is the result of an identifiable structural, metabolic or other abnormality. Primary headaches constitute the vast majority of headaches in childhood and adolescence. Frequency of headache increases with age in this population<sup>[8]</sup>.

In the present study we aimed to determine epidemiologic characteristics and compare socioeconomic and some clinical factors related to primary headaches in children/adolescents (4-15 year olds) presented to neurology clinics of Tabriz University of Medical Sciences.

## Subjects and Methods

The Institutional Review Board at Tabriz University of Medical Sciences approved the study protocol. After obtaining a written informed consent from parents, children with 4-15 years of age and with the diagnosis of primary headache (migraine or tension-type headaches) who presented to the neurology clinics affiliated to Tabriz University of Medical Sciences, Tabriz, Iran from March 2009 to October 2011 were included in this cross-sectional study. A total of 190 patients fulfilled the criteria for enrollment in the study and their demographics were collected. We noted the type of headache, history of atopy, asphyxia during labor (according to the history of admission in the neonatal intensive care unit after birth due to respiratory problems based on the parents' report and review of the previous medical records) and breast feeding, family history of headache, presence of headache triggers and the socioeconomic status of the family. Diagnosis of migraine and tension-type headache was based on

the International Headache Society diagnostic criteria for the primary headache disorders. Socioeconomic status was determined according to the total monthly family income (<7,000,000 RL vs  $\geq$ 7,000,000 RL) based on the index of statistical center of Iran for grand cities in the years of study in addition to the highest level of education of the father (< or = high school vs. > or = college).

Statistical analysis was conducted with SPSS, version 16.0 for window (SPSS, Chicago, IL). Data were expressed as mean $\pm$ SD for quantitative variables and as numbers and percentages for categorical variables. Statistical analysis was performed using the chi-square test for categorical variables and the Student's t test for numerical variables. All *P*-values were two-tailed and *P*<0.05 was considered statistically significant.

## Findings

Eighty eight patients (46.3%) had migraine and 102 patients (53.7%) had tension-type headache. The distributions of gender and age groups in patients with migraine or tension-type headache are shown in Table 1.

No significant differences were seen in the distribution of gender between the patients with migraine and tension-type headache. Migraine and tension-type headache had comparable frequency in different age groups of male patients (*P*=0.1 and 0.07, respectively). In female patients the frequencies of both migraine and tension-type headache were significantly higher in the age group of 10-15 years as compared to the age group of 4-9 years (*P*=0.03 and 0.04, respectively). There was no significant differences regarding the prevalence of migraine or tension type headache between different genders in the same age group.

The most common clinical presentations of aura in patients with migraine are demonstrated in

**Table 1:** The distributions of gender and age groups in patients with migraine or tension-type headache

Type of headache	Migraine headache		P. Value	Tension-type headache		P. Value
	Male	Female		Male	Female	
4-9 yr	12	16	0.4	21	24	0.6
10-15 yr	26	34	0.3	24	33	0.2
<b>P-value</b>	0.1	0.03		0.07	0.04	

Data are presented as numbers

**Table 2:** The clinical presentations of aura in patients with migraine

Type of aura	Numbers of patients
Visual disturbance	5
Confusion	3
Vertigo	2
Monoparesis	2
Paresthesia in extremities	2
Dysarthria	2
Lightheadedness	1
Hemiparesis	1

Table 2. The comprehensive data regarding the epidemiologic characteristics of patients with migraine or tension-type headache in our study group are shown in Table 3.

History of asphyxia during labor was more prevalent among patients with migraine as compared to the tension-type headache ( $P=0.007$ ,  $OR=3.24$ ). History of headache in parents was also significantly higher in patients with migraine as compared to tension-type headache ( $P=0.001$ ,  $OR=3.19$ ). Moreover, the prevalence of atopy was significantly higher in patients with migraine ( $P=0.01$ ,  $OR=5.70$ ).

Prevalence of feeding with formula during infancy did not differ between the patients with either migraine or tension-type headache ( $P=0.9$ ). The low socioeconomic status was more prevalent

in patients with migraine headache ( $P=0.003$ ,  $OR=2.38$ ).

## Discussion

In our study primary headache was more common in older age group which is consistent with Danold's findings which showed that frequency of headache increases with age<sup>[8]</sup>. Tension type headache in patients was more frequent than migraine which is comparable with findings of Kroner-Herwig et al<sup>[9]</sup>. The main finding in the present study was that gender cannot predict the type of primary headache in younger children, as

**Table 3:** The characteristics compared between patients with migraine and tension-type headache

Parameter		Migraine (n=88) n (%)	Tension headache (n=102) n (%)	OR	95% CI	P. value
Age (years)	4-9	28 (31.8)	45 (44.1)	0.59	0.33 - 1.07	0.08
	10-15	60 (68.2)	57 (55.9)			
Gender	Female	50 (56.8)	57 (55.9)	1.04	0.58 - 1.85	0.9
	Male	38 (43.2)	45 (44.1)			
Light*	Yes	8 (9.1)	6 (5.9)	1.60	0.53 - 4.8	0.4
	No	80 (90.9)	96 (94.1)			
Noise*	Yes	21 (23.9)	14 (13.7)	1.97	0.93 - 4.16	0.07
	No	67 (76.1)	88 (86.3)			
Child abuse*	Yes	4 (4.5)	6 (5.9)	0.76	0.21 - 2.79	0.7
	No	84 (95.4)	96 (94.1)			
Intrapartum asphyxia	Yes	19 (21.6)	8 (7.8)	3.24	1.34 - 7.82	0.007
	No	69 (78.4)	94 (92.2)			
Family history of headache	Yes	28 (31.8)	13 (12.7)	3.19	1.53 - 6.66	0.001
	No	60 (68.2)	89 (87.2)			
History of atopy	Yes	9 (10.2)	2 (2.0)	5.70	1.2 - 27.12	0.01
	No	79 (89.8)	100 (98.0)			
Formula feeding	Yes	9 (10.2)	10 (9.8)	1.05	0.41 - 2.71	0.9
	No	79 (89.8)	92 (90.2)			
Low socioeconomic status	Yes	55 (62.5)	42 (41.2)	2.38	1.33 - 4.27	0.003
	No	33 (7.5)	60 (58.8)			

\*As triggering factors for headache; OR: Odds Ratio; CI: confidence Interval

no gender differences were seen between the patients with migraine or tension-type headache in the age group 4-9 years. This finding is in contrast to previous report by Kröner-Herwig et al which showed that being female was a significant predictor for three main subtypes of primary headaches i.e., migraine, tension-type and non-classifiable headache<sup>[9]</sup>. A few other studies showed that the prevalence of migraine was higher in the males<sup>[10,11]</sup>. Our results also demonstrated that the frequencies of migraine and tension-type headache were comparable in different age groups of male patients, whereas female patients in the age group 10-15 years had higher frequency of both types of headache especially migraine as compared to the age group 4-9 years. This finding reveals that female adolescents had higher risk for developing primary headache specially migraine as compared to female children. These results agree with those reported by Kröner-Herwig et al who showed that children with migraine were significantly older than children in the other groups<sup>[9]</sup>. It could be due to hormonal effect as the trigger of migraine headache in the female adolescents.

It was previously shown that primary headache in children is closely related to history of headache in their parents<sup>[12-14]</sup>. Our results demonstrated that when a parent showed combined headache, the risk of developing migraine in his or her child is more conspicuous as compared to the tension-type headache. This finding is consistent with previous reports by Fallahzadeh et al<sup>[9]</sup> and Kröner-Herwig et al<sup>[10]</sup> which showed a stronger association between family history of headache and being afflicted by migraine as compared to tension-type headache in children. Our study also demonstrated that if the patients with history of peripartum asphyxia would develop primary headache it would more probably be of migraine type. These results partly agree with those reported by Maneyapanda et al who found an association between chronic migraine headache and significant perinatal insult due to neuroplasticity and its induced hyperexcitability. They suggested that pain experience in neonate can alter the later experience of pain<sup>[15]</sup>. However, it is recommended to design prospective studies to compare the frequency of primary headache (either migraine or tension-type headache) in patients with or without perinatal insults to

elucidate the role of peripartum asphyxia as a risk factor for developing primary headaches.

We also showed that atopy is more prevalent in patients with migraine as compared to tension-type headache. This is consistent with previous studies<sup>[16,17]</sup>. Also Ozge et al found an association between atopy and both migraine and episodic tension-type headaches<sup>[18]</sup>. It has been shown that alteration in several interleukins occurs in migraine which supports an association between migraine and atopic disorders<sup>[19-21]</sup>. Although it was shown by Pogliani et al that breast feeding has a protective role against primary headache disorders<sup>[22]</sup>, our results showed that children and adolescents with history of formula feeding during infancy have comparable prevalence of developing either migraine or tension-type headache.

Our results showed that socioeconomic status of the patients could significantly influence the frequency of migraine in comparison to tension-type headache. Ayzenberg et al in a study on 2725 adults in Russia, showed that low socioeconomic status is associated with higher frequency of primary headache disorders<sup>[23]</sup>. Isik et al found similar results<sup>[11]</sup>. Moreover, Katsarava et al in another study on 1145 adult patients in the Republic of Georgia showed that low socioeconomic status and female gender are risk factors for development of migraine, not tension-type headache<sup>[24]</sup>.

The main limitation of the present study is small sample size. Moreover, the possible role of psychological factors and behavioral characteristics influencing primary headaches could have been considered.

## Conclusion

Headache in children and adolescents is a common and debilitating problem. Physicians need more knowledge about primary headache and their associated factors in children. While some variables have been checked by the present report, further prospective studies with larger sample sizes are needed to provide more comprehensive data regarding associated factors in childhood primary headache.

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**Conflict of Interest:** None

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