

Prevalence of migraine and tension-type headache among school children in Yazd, Iran

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Abstract

Objective:

The etiology and pathogenesis of migraine and other types of headache are still under discussion. The aim of this study was to investigate the prevalence of migraine and tension-type headache and its association with demographic variables among schoolchildren.

Materials and Methods:

A cross-sectional study was performed on 930 school children (aged 12–14 years) through cluster sampling method. International Headache Society criteria were used for diagnosis. Descriptive statistics and logistic regression were used for data analysis.

Results:

The prevalence of migraine headache was 12.3% (95% CI: 10.2–14.4) and tension-type headache was 4.2% (95% CI: 2.9-5.6). The factor associated with migraine in multivariate analysis were age and sleep disturbances.

Conclusions:

Migraine is common among school children, although it may be under-recognized. Because children with migraine and tension-type headache have a high prevalence of sleep disturbances, they should always be evaluated for the presence of sleep problems.

Keywords: Epidemiology, headache, migraine, prevalence, tension-type headache

Introduction

Migraine is a chronic neurologic disorder characterized by recurrent episodes of headache and associated symptoms (eg, nausea, sensitivity to light and noise) that typically last from 4 to 72 h.[1] In Western countries, the condition affects approximately 11% of the adult population.[2] Primary headaches occur frequently in childhood. In large population-based studies, approximately 10% of children meet International Headache Society (IHS) criteria for migraine headache.[3,4]

The prevalence rate of migraine was reported to be 78% (weekly), among 10-to 17-year-old Dutch; 10.6% among Aberdeen (United Kingdom) 5- to 15-year-old schoolchildren, 3.4% among Istanbul (Turkey) schoolchildren, 11.3% (lifetime) among Cotonou (Benin) University students, 6.1% among Shiraz (Iran)

school children, and 26.5%(lifetime) in Norway population.[3,5–9] Tension-type and nonspecific recurrent headaches have been reported in another 2%-6% of children.[3,8]

Organic factors are essential in migraine and include heredity, neurogenic inflammation, neuropeptides, and neurophysiological changes.[10–12] Psychosocial mechanisms include social and economic status, residence and housing conditions, family conditions, psychiatric and somatic comorbidity, and behavioral problems.[13] Headache is more common among children with lower socioeconomic groups.[6] A higher number of persons per room and a lower housing standard were associated with a higher frequency of headache.[14] Another study determined children with migraine headaches have a high prevalence of sleep disturbances.[15,16]

This study was conducted to determine the prevalences of migraine and tension-type headache among schoolchildren of Yazd (Iran) and to identify associated risk factors.

Materials and Methods

Place of study

Yazd, one of the large cities of the Islamic Republic of Iran, is the center of Yazd Province. The city is located 750 km south of the capital Tehran. It has a dry climate and a population of 750,000 people.

Type of study

This was a cross-sectional study among school-aged children during the academic year 2008–2009.

Sampling method and sample size

The sample size was calculated as 930 individuals based on a prevalence of 10% with a margin of error of 2%, a confidence interval (CI) of 95%, and a design effect of 1.5. The city Yazd has 32 schools. All schools were listed and among them, 11 were selected by the systematic sampling method. Three classes were also randomly chosen from every school and in total 33 classes were selected from all the schools. The data were collected in 2008.

The questionnaire

The questions about the demographic data included the name, age, sex, school name, and class name of the student. A face-to-face interview was conducted by qualified physician trained for this study for all schoolchildren. The details of headache history and sleep patterns (sleep disturbances including insufficient sleeping, oversleeping) were recorded. A semi-structured questionnaire[8] was used to screen headache among the children, applying the IHS classification for migraine and tension-type headache [Table 1].[1] Questions about headache were about experience of headache over the past year, severity, duration, times, associated symptoms (nausea, vomiting, photophobia, and phonophobia), and family history.

Statistical methods

Statistical analyses were performed using SPSS for Windows Release 15.0. Usual descriptive analysis was used: Means and standard deviations, frequencies and confidence intervals (CI). To estimate the association between migraine and covariates, odds ratios and their CI at 95% were estimated for the categories of age, sex, family history of migraine. Pearson's Chi-square test was used for the comparison of categorical variables. A logistic regression model has been established. We included in the initial model all the variables significantly associated in univariate analysis. The level of significance has been fixed to 0.05 throughout analysis.

Results

In total, 930 students aged 12–15 years participated in this study with a mean and a standard deviation of 13.3 ± 0.98 years; a total of 469 males (50.5%) and 460 females (49.5%). Sociodemographic variables and headache characteristics of the participants are presented in Table 2.

The prevalence of migraine was 12.3% (95% CI: 10.2–14.4) ($n=114$), and the prevalence of tension headache was 4.2% (95% CI: 2.9–5.6) ($n=39$) [Table 2].

Table 3 shows the prevalence of migraine according to the age, sex, familial history of migraine, and the duration of headache history and severity of pain. The rates of migraine and tension headache among students with a family history of headache groups were 13.8% and 5.1%, respectively ($P<0.01$).

The rate of absence from school among migraine and tension headache groups was 48.2% and 20.5%, respectively. In children with migraine and tension headache the prevalence of insomnia were 70.1% and 64.1%. The prevalence of visual and somatic aura in migraine groups were 42.9% and 49.1%, moreover in tension headache group that were 33.4% and 38.5%; 26.5% of patients with migraine had visited a physician but only 4% of patients with tension headache reported this history.

Univariate analysis showed that age, gender, family history of headache among first-degree relatives, insomnia, and visual aura and somatic aura were significantly associated with the presence of migraine ($P<0.05$), moreover we found that only family history of headache among first-degree relatives were significantly associated with the presence of tension-type headache ($P<0.05$) [Table 3].

Logistic regression analysis was conducted separately for migraine and tension headache groups [Table 4]. The results of logistic regression showed that insomnia and age were associated with migraine headache after adjusting for age, sex, and family history of headache (odds ratio [OR]=1.85, 95% CI: 1.19–2.89, $P=0.006$). There was no factor associated with tension headache in multivariate analysis.

Discussion

This study examined the prevalence of migraine and tension-type headache with IHS criteria.[1] The sampling was performed using the technique of cluster sampling, which limited the selection bias and we obtained good precision because we had a large sample size.

In this study, the prevalence of migraine was 12.3%. It was close to 10.6% among Aberdeen (United Kingdom) school children, but twice the prevalence reported by Ayatollahi[8] among Iranian school children.[3] In an Italian study, the overall migraine prevalence was 3%.[17]

The prevalence of tension-type headache was determined as 4.2%, which is lower than that observed in other studies.[18] A previous study performed among school children in southern Iran in 1998 also showed a higher prevalence (12.1%) of tension-type headache.[8] In a Saudi Arabian study, the tension-type headache prevalence was 14%.[3] The low prevalence of tension-type headache in our study compared with other studies may reflect age-related psychological differences.

The prevalence of migraine in our study was slightly higher in males compared with females.

According to Isik *et al.*,[6] the prevalence of migraine in males was higher than that in females, which is consistent with our study results. Although we found an association of migraine with age, we did not observe an increase in the prevalence of migraine with advancing age, as previously described. According to Stewart *et al.*,[19] the incidence of migraine without aura in female peaked between the age of 14 and 17 years. Isik *et al.*[16] and Scher *et al.*[2] showed that the prevalence of migraine increases with age.

The rate of family history of headache was 80% in our study, which is consistent with previous studies. [16,21] In this study, migraine headache was also associated with insomnia and the OR of migraine headache in school children with insomnia was 1.8. In previous studies, increased sleepiness was associated with headache in children.[16,22] Our results are concordant with these investigations. Miller *et al.*[22] showed that children with migraine have a high prevalence of sleep disturbances. Isik *et al.*[16] showed that migraine was associated with parasomnias. Bedtime struggle, teeth grinding, sleep vocalizations, nightmares, and sleep walking rates were highest among the migraine group, followed by the no migraine and no headache groups. The direction of the relationship between headaches and sleep is unknown. Regardless, interventions targeting sleep habits may improve headache symptoms. In conclusion, the results of the study show that migraine is common among school children and sleep disturbances might be a risk factor for migraine headache.

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Footnotes

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Conflict of Interest: None declared.

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Figures and Tables

Table 1

Tension-type headache	Migraine headache
A. At least 10 previous headache episodes fulfilling criteria below	A. At least 5 attacks fulfilling the criteria below
B. Headache lasting from 30 min to 7 days	B. Headache lasting 4-72 h (2-48 h in children)
C. At least 2 of the following pain characteristics: <ol style="list-style-type: none"> 1. Pressing (nonpulsating) quality 2. Mild or moderate intensity (may inhibit but doesn't prohibit activities) 3. Bilateral location 4. Not aggravated by climbing stairs or similar routine physical activity 	C. Headache characterized by at least two of the following: <ol style="list-style-type: none"> 1. Unilateral location 2. Pulsating quality 3. Moderate or severe intensity (inhibits or prohibits daily activity) 4. Aggravated by climbing stairs or similar routine physical activity
D. Both of the following: <ol style="list-style-type: none"> 1. No nausea or vomiting 2. Photophobia and phonophobia are absent or only one is present 	D. Headache accompanied by at least 1 of the following: <ol style="list-style-type: none"> 1. Nausea or vomiting, or both 2. Photophobia and phonophobia

Diagnostic criteria for tension-type headache and migraine (adapted from the international headache society[1])

Table 2

Variables	<i>n</i> (%)
Sex	
Boy	469 (50.4)
Girl	461 (49.6)
Total	930 (100)
Age (years)	
12	228 (24.5)
13	287 (30.9)
14	303 (32.6)
15	112 (12)
Total	
History of headache	
Yes	648 (69.7)
No	282 (30.3)
Total	930 (100)
Type of headache	
Migraine	114 (12.3)
Tension type headache	39 (4.2)
Family history of headache	
Yes	739 (80)
No	185 (20)
Total	924 (100)

Demographic variables and headache characteristics of the participants

Table 3

	Migraine		Tension-type headache	
	<i>n</i> (%)	<i>P</i> value	<i>n</i> (%)	<i>P</i> value
Sex				
Boy	73 (15.6)	0.002	25 (5.3)	0.081
Girl	41 (8.9)		14 (3)	
Age (years)				
12	35 (15.4)	0.029	12 (5.3)	0.287
13	22 (7.7)		12 (4.2)	
14	40 (13.2)		8 (2.6)	
15	17 (15.5)		7 (6.4)	
Total				
Family history of headache				
Yes	102 (13.8)	0.007	38 (5.1)	0.005
No	12 (6.5)		1 (0.5)	
History duration of headache, mean (SD)	5 (14.9)		2.1 (2)	
Pain severity, 0–10 scale, mean (SD)	6.97 (2.3)		6.13 (2.25)	

The association of several characteristics with migraine and tension-type headache presence: Univariate analysis

Table 4

	Migraine			Tension-type headache		
	OR	P value	(95% CI)	OR	P value	(95% CI)
Age (years)		0.075			0.428	
12	1					
13	0.476	0.013	(0.26–0.86)	0.78	0.553	(0.34–1.77)
14	0.843	0.517	(0.50–1.41)	0.46	0.097	(0.18–1.51)
15	0.644	0.195	(0.33–1.26)	0.78	0.618	(0.29–2.09)
Sex						
Boy	0.166	1.37	(0.88–2.14)	1.24	0.555	(0.61–2.50)
Girl	1					
Family history of headache						
No	1					
Yes	1.15	0.68	(0.59–2.23)	0.18	0.013	(0.02–1.32)
Oversleep						
No	1					
Yes	1.20	0.436	(0.76–1.90)	0.83	0.645	(0.39–1.80)
Insomnia						
No	1					
Yes	1.80	0.009	(1.16–2.80)	1.25	0.513	(0.64–2.43)

OR: Odds ratio

The association of several characteristics with migraine and tension-type headache presence: Multivariate analysis

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