Headache in Junior High School Students: Types & Characteristics in Thai Children

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Objective: *To survey the prevalence, types, and characteristics of headache in junior high school students.*
Material and Method: *A two-stage study was conducted in seventh grade students in Bangkok, Thailand. A screening self-administered check-list questionnaire and a face-to-face interview followed by physical examination were performed. Headache was diagnosed and classified according to the Second Edition of the Classification of Headache Disorder criteria.*
Results: *953 students (448 boys and 505 girls, mean-age 13.2 years) in seventh grade, participated in the present study. Eight hundred thirty three students (87.4%) reported of having five episodes of headache in the past three months. After person-to-person interview; there were 121 (12.6%), 116 (12.1%), nine (0.9%), and seven (0.7%) students who had headache attributing to rhinosinusitis / upper respiratory tract infections, migraine, nonspecific headache with upper-limit systolic blood pressure, and tension-type headache respectively. Lack of sleep and stress related to daily school-activities were reported as headache precipitator in 25 and 23 students with migraine, respectively. School absenteeism was documented in four students with migraine. Only one student received migraine prophylactic treatment.*
Conclusion: *Headache was common in Thai grade seven schoolchildren. Awareness of its high prevalence in these age-group children will lead to early identification of students who may need intervention and specific treatment.*

Keywords: *Headache, Migraine, Schoolchildren, Prevalence, Thailand*

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Headache is a common illness in children and adolescents. It is a common cause of school absence. There were studies in various regions reporting the prevalence of headache in children ranging from 24 to 82%[1-8]. A wide range of prevalence is partially explained by the variation of studied population, ages, and criteria for diagnosis. In addition, differences in ethic may contribute to a variable prevalence[9].

In Thailand, there were not many studies in childhood headache. Prevalence of headache and its subtypes varied to studied population. A hospital-based study in 439 children presenting with headache at the Out-Patient Department disclosed a prevalence of primary headache disorder of 84% consisting of migraine and tension-type headache of 35.2% and 12.5% respectively[10]. A school-based questionnaire survey without tandem interview in 3,547 students in seventh grade demonstrated a prevalence of headache of 20% and 4.5% prevalence of migraine[11]. A recent cross-sectional study in 1,789 students in seventh grade Thai schoolchildren revealed that more than 80% reported at least five episodes of headache during the past three months. Migraine was confirmed in 13.8% of all students after person-to-person interview[12]. However, there was no information of other types of headache in this population[12].

In a hospital-based study, there was a tendency to obtain a higher prevalence of serious cause of headache than that in the general population. Population-based, therefore, will give a real magnitude of the problem and will lead to appropriate intervention and prevention[13]. Therefore, this pilot study was conducted to determine the prevalence of headaches and headache subtypes in Thai junior high school students by questionnaire and person-to-person interview, which was not conducted previously[11,12].

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The information obtained in the present study would contribute towards the understanding of headache situation in schoolchildren and would be the initial step for further study.

Material and Method

The present study was aimed to determine the prevalence of headache in a specific age-range for further cohort study. In Thailand, education prior to college or university for bachelor degree requires six years in primary and elementary school and another six years at high-school level. The high school level is divided into junior and senior high school levels comprising three years each. The age of entry for first grade is between 6 to 7 years and the age of entry for junior high school (7^{th} grade) is between 12 to 13 years. Therefore, schoolchildren in seventh grade were chosen to determine the prevalence of headache in children aged 12-13 years.

A cross-sectional study was conducted in the seventh grade schoolchildren in two junior high schools in Bangkok, Thailand in July and August 2006. These two schools were randomly selected from 10 schools in the Adolescent Health-Promotion Program, which was a pilot program under the supervision of the Department of Pediatrics, Ramathibodi Hospital. Diagnosis of headache consisted of two stages in the present study.

The first stage was a questionnaire screening of the frequency and the characteristics of headaches in every student. To obtain the data, each student individually completed a self-administered questionnaire, which contained open questions and check-list questions relating to the characteristics and associated symptoms of headache in the past three months.

Second stage was conducted immediately after the first stage. Each student was interviewed face-to-face by a pediatric neurologist who was blinded to the answer of each questionnaire. A checked list containing questions pertaining to history, characteristics, associated symptoms, precipitating factor of headaches was applied to every student. Previous treatment or remedy during headache was collected. Physical examination, including measurement of blood pressure, was then performed after the interview. Headache was classified according to the International Classification of Headache Disorder edition II, which mainly relied on the data obtained by face-to-face interview[13]. Physical examination was also performed to exclude other causes of headache. Students whose systolic blood pressure was close to the upper-normal limit for for-age would receive a second measurement after a 15-minute rest. If there were no changes in systolic blood pressure, they would be categorized into nonspecific headache with borderline-normal systolic blood pressure. Student who had headache associated to any non-specific systemic infection including rhinopharyngitis and rhinosinusitis would be classified into headache attributing to rhinosinusitis. Migraine would be diagnosed in students whose headache characteristics fulfilled the criteria for diagnosis of migraine proposed by The International Classification of Headache Disorder edition II[13]. Referral to a primary care physician for appropriate management was recommended and would be followed by a school nurse. Descriptive analysis with frequency and percentage are applied for all collected data.

Results

There were 953 students (448 boys, 505 girls) in the seventh grade of the two Junior High schools. All of these students participated in this study. Their ages ranged from 12 to 14 years (mean 13.2 years). Eight hundred thirty three students (366 boys and 467 girls) initially reported more than five episodes of headache in the past three months from the questionnaire. After face-to-face interview, 580 students had previous headache, which did not fit to any classification and were categorized into nonspecific headaches (Table 1). Nine students with nonspecific headache had borderline high-normal systolic blood pressure for age. Headache attributing to rhinosinusitis,

Table 1. Demographic data and classification of headache

	Number of students	Percent
Total students	953	100
Boys	448	47.1
Girls	505	52.9
Age		
Range (years)	12-14	
Mean (years)	13.2	
Students without headache in the past 3 months	120	12.6
Students with nonspecific headache	580	60.8
Boys	266	45.8
Girls	314	54.2
Students with classified headache	253	26.5
Boys	100	39.5
Girls	153	60.5

which was classified into secondary headache disorder, was found in 121 students (47.8%). The remaining 123 students were diagnosed with primary headache disorders consisting of migraine and tension-type headache in 116 and seven students respectively (Table 2). One hundred nineteen students had a history of medical evaluation for their headaches. The number of students with subtype of headache according to genders is shown in Table 3. Among those with migraine, migraine with aura and migraine without aura were diagnosed in 114 and two students respectively (Table 4). Stress related to daily school activities, excessive use of computer, and lack of sleep were reported as precipitating causes of headache in all students with diagnosis of tension-type headache. Inadequate sleep or lack of sleep and stress related to daily school activities were reported as the precipitating causes of migraine in 25 and 23 students respectively. Four students reported school absenteeism caused by severe headache. One student was taking a short period of prophylactic drug for migraine.

There were nine children whose systolic blood pressures were at the upper limit for age, which was confirmed by two measurements. Their physical examinations were unremarkable. Awareness of headache was brought to their teachers and parents' attentions. These students had been monitored for recurrent headache until the date of this report and all were in good health.

Discussion

Headache is a common problem in children and adolescents. Since Bille documented the prevalence of 3.9% with migraine and 6.8% of non-migraine headache in 8993 Swedish schoolchildren aged 7-15 years, there have been a number of studies exploring the magnitude of headache in various populations[1]. Age group, socioeconomic, tradition, ethnic and nationality, methodology, and different case definition were variables for wide-range of prevalence[14]. In the first step of the present study, up to 87.4% of the schoolchildren had at least five episodes of headache during the past three months. After interviewing in person, most of their headaches were nonspecific and were not classifiable according to the ICHD-II. There were 253 students for further classification. Therefore, the prevalence of headache was reduced to 26.5%. This is an example of the influence of method to the prevalence. Nevertheless, the prevalence that was obtained in this group of children was still high. Table 5 demonstrates various prevalence of headache in

Table 2. Types of headaches among 253 students

	Number of students	Percent
Headache attributing to rhino-sinusitis	121	47.8
Nonspecific headache with upper-limit systolic blood pressure	9	3.6
Migraine	116	45.8
Tension-type headache	7	2.8
Total	253	100

Table 3. Types of headaches observed in each gender

	Boys n (%)	Girls n (%)	Total
Attributing to rhino-sinusitis	50 (41.3)	71 (58.7)	121
Migraine	40 (34.5)	76 (65.5)	116
Nonspecific with upper-limit	7 (77.7)	2 (22.3)	9
Tension-type	3 (42.8)	4 (57.2)	7
Total	100	153	253

Table 4. Demographic and clinical data in students with migraine (n = 116)

	Number of students	Percent
Number of students	116	12.2
Genders		
Boys	40	34.5
Girls	76	65.5
Type of migraine		
Migraine with aura	2	1.8
Migraine without aura	114	98.2
Precipitating factors of migraine		
Stress: related to school activities	23	19.8
Stress: related to domestic and familial condition	5	4.3
Inadequate sleep	25	21.5
Excessive environment with bright light	10	8.6
Video/computer game associated	3	2.5
Excessive use of computer (more than 2 hours)	1	0.8
Treatment during migraine headache		
Acetaminophen	70	60.3
No treatment or sleep	46	39.7
School absence in students with migraine		
History of at least one day of school absence	4	3.5
No history of school absence	112	96.5

Table 5. Prevalence of headache and migraine in schoolchildren in various countries

Author	Year	Country	Sample size	Age Range (years)	Method	Criteria	Headache prevalence (%)			Migraine prevalence (%)		
							Boys	Girls	Total	Boys	Girls	Total
This study	2008	Thailand	953	12-13	Q & I	ICHD-II	22.3	30.2	26.5	8.9	15.1	12.2
Ando[15]	2007	Japan	6,472	12-15	Q	ICHD-II	-	-	22.8	3.3	6.5	4.8
Milovanovic[7]	2007	Serbia	1,259	7-12	I	IHS-R	-	-	32.8	2.1	4.6	3.3
Visudtibhan[12]	2007	Thailand	1,789	12-13	Q & I	ICHD-II	-	-	-	11.7	16.2	13.8
Karli[5]	2006	Turkey	1,270	12-14	Q & I	ICHD-II	41.5	52.6	47.1	-	-	13.5
Bugdayci[16]	2005	Turkey	5,562	8-16	Q	IHS	-	-	49.2	-	-	10.4
Laurell[17]	2004	Sweden	1,371	7-15	Q & I	IHS	46.2	52.8	44.8	-	-	11
Zencir[18]	2004	Turkey	2,490	11-18	Q	IHS	-	-	-	6.7	11	8.8
Al-jumah[4]	2002	Saudi Arabia	1,181	6-15	Q	IHS	40	47	44	5.2	7	6.2
Kong[19]	2001	Hong Kong	2,120	6-13	Q	IHS-R	-	-	2.8	-	-	0.5
Lu[20]	2000	Taiwan	4,064	13-15	Q	IHS	-	-		5.7	7.8	6.8
Bener[21]	1998	UAE	1,159	6-14	Q & I	IHS	-	-	37	-	-	3.8
Lee[22]	1997	USA	2,229	5-13	Q	IHS				8.8	10.8	9.9
Raieli[3]	1995	Italy	1,445	11-14	Q & I	IHS	20	28	24	2.7	3.3	3
Abu-Arefeh[2]	1994	UK	1,754	5-15	Q & I	IHS	-	-	66	9.7	11.5	10.6
Sillanpaa[23]	1983	Finland	3,784	7-13	Q & I	Vahlquist	80	84	81.9	8.1	15	11.6
Bille[1]	1962	Sweden	8,993	7-15	Q & I	Vahlquist	58	59	-	3.3	4.4	-

ICHD II = international classification of headache disorder 2nd edition; IHS = international headache society; IHS-R = international headache society-revision; Q = questionnaire survey; I = interview; Q & I = questionnaire survey with interview

schoolchildren. The present report and other studies confirmed that headache was common in school-children and should be brought to the attention of those who are involved with the care of this group of children.

Regarding types of headache, headache attributing to nonspecific infection and rhinosinusitis, which was a secondary headache disorder, is the most common cause of headache in this group. The result was different from hospital-based studies where primary headache disorder was the most common cause of headache[10,22]. A possible explanation is the severity of headache attributing to nonspecific infection and rhinosinusitis was mild and could be relieved by simple medication and rest or even from self-remission. It was therefore not necessary for the parents to bring the children for evaluation in the hospital.

Among primary headache disorder, migraine was diagnosed in 12%. This result confirmed the high prevalence of migraine in schoolchildren reported in a recent study in Thai schoolchildren and other studies[2,5,12,16,17]. This finding might be the consequence of the revision of the criteria for diagnosis of migraine in children. These recent criteria allowed one-hour duration of headache to fulfill the diagnostic criteria for migraine in children[13,24]. The present study applied ICHD-II criteria for diagnosis. Therefore, there was a possibility to include more children than the first edition, which indicated two hours of headache[24,25].

Tension-type headache, which is another type of primary headache disorder and a common cause of headache in a hospital-based study[10], was diagnosed in only 0.7% of schoolchildren in the present study. This finding is not in line with a study in Chinese students in Hong Kong[26]. The present study indicated that the new criteria in the ICHD-II increased in sensitivity and specificity of making diagnosis of tension-type headache[26]. However, it might be premature to conclude that tension-typed headache is not common in junior high schoolchildren. Further study in a larger number of students should be conducted.

School absenteeism due to headache in the present study was quite low. Interestingly, only four students reported one-day school absence and all of them were migrainuers. Most of the students were able to cope with the symptoms. Only a small number needed first-line analgesic drug like acetaminophen to relieve their headache. Less than 3% of students sought medical consultation and received only advice to avoid any precipitating cause of migraine and symptomatic treatment during a migraine attack. This finding may imply that headache and migraine in this age group is not as serious as in adults despite the high prevalence.

Concerning difference between genders, the present study also confirmed that prevalence of headache is higher in girls. Prevalence of migraine in girls was 1.9 times of that in boys. Among girls with headache in the present study, there was no correlation to menstruation as previously postulated that a change or differences in sex hormones might contribute to the discrepancy of the prevalence between genders[27].

The present study consisted of a questionnaire, person-to-person interview, and physical examination; therefore, it was likely to result in more accurate information than a sole questionnaire survey[28]. A questionnaire survey is a practical method to obtain data in a large number of subjects[8,29]. One limitation of questionnaire survey is the recall bias, which most likely occurs in children[28,29]. Direct interview immediately after completion of questionnaire as being conducted in the present study allowed students to recall their symptoms. Therefore, the authors were convinced that the prevalence and characteristics of headache obtained in this present study were reliable. Another advantage of the present study was the subjects. All were seventh grade students with short-range of age between 12 to 14 years and a mean-age of 13.2 years. Though, the present study was conducted in only two high schools and the result could not generally apply as the representative prevalence of the country; nevertheless, the result at least gave the overview magnitude of headache in this group of Thai schoolchildren compared to other studies and may be applied for further headache studies.

There were limitations of the present study. Firstly, the two junior high schools are located in Bangkok, therefore selection bias is not deniable. Secondly, the diagnosis was made according to each student's ability to recall his or her symptoms. There was a possibility that a recall of the symptoms might not be precise or completely retrievable. Determination of the risks for recurrent headache was not possible. Finally, this was a cross-sectional study whereas headache is an illness with dynamic course. Hence, the information, which was obtained at the time of study, only represented the situation then.

Nevertheless, this pilot study provided a preliminary picture of headache in Thai grade seven schoolchildren. It confirmed that headache was common and was not different from those studies in

other countries (Table 5). Secondary headache disorder attributing to nonspecific upper respiratory tract infection was the most common cause in this group. Early and appropriate treatment of infection in those who had frequent headache in association with respiratory tract infection and avoidance of precipitating factors in those who had migraine should be the first step in the management of headache in schoolchildren. The data obtained from the present study may be used for further study in a larger number of students to determine the prevalence of Thai children in various age groups.

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Disclosure

This study is a part of the study to evaluate the revised migraine self-administrative screening questionnaire for the diagnosis of migraine in seventh grade Thai students (protocol number ID 09-49-03) which was reviewed and approved by Committee on Human Rights Related to Research Involving Human Subjects, based on the Declaration of Helsinki (MURA 2006/314). The data and results that were obtained in this study have not been published elsewhere since the study was completed.

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การศึกษาชนิดและอาการปวดศีรษะในเด็กนักเรียนมัธยมศึกษาปีที่ 1

อนันต์นิตย์ วิสุทธิพันธ์, ชมพูนุท บุญโสภา, ลัลลิยา ธรรมประทานกุล, ประชา นันท์นฤมิต, ชูศักดิ์ โอกาศเจริญ, ชัยยศ คงคติธรรม, สุรางค์ เจียมจรรยา, พงษ์ศักดิ์ วิสุทธิพันธ์

วัตถุประสงค์: *เพื่อศึกษาอุบัติการณ์ ชนิด และลักษณะอาการปวดศีรษะในเด็กนักเรียนมัธยมศึกษาชั้นปีที่ 1 เพื่อใช้เป็นข้อมูลพื้นฐานการศึกษาต่อไป*

วัสดุและวิธีการ: *ได้ทำการศึกษา 2 ขั้นตอนในนักเรียนชั้นมัธยมศึกษาปีที่ 1 ในกรุงเทพมหานคร ขั้นตอนแรกประกอบด้วยการใช้แบบสอบถามอาการปวดศีรษะ ขั้นตอนที่ 2 ทำการสัมภาษณ์ตัวต่อตัว ตามด้วยการตรวจร่างกายเด็กนักเรียนที่ตอบแบบสอบถามทุกคน เด็กนักเรียนที่มีอาการปวดศีรษะจะถูกวินิจฉัย และจำแนกชนิดโรคปวดศีรษะตามแนวทางการจำแนกโรคปวดศีรษะโดยสมาคมโรคปวดศีรษะนานาชาติฉบับที่ 2 (International Classification of Headache Disorders, Second Edition)*

ผลการศึกษา: *มีเด็กนักเรียนชั้นมัธยมศึกษาปีที่ 1 ในสองโรงเรียนสองจำนวน 953 คน เข้าร่วมในการศึกษานี้ เป็นเด็กหญิง 505 คน เด็กชาย 448 คน มีอายุเฉลี่ย 13.2 ปี เด็กนักเรียนจำนวน 833 คน (ร้อยละ 87.4) รายงานว่ามีอาการปวดศีรษะอย่างน้อย 5 ครั้งในระยะเวลา 3 เดือน ที่ผ่านมาจากการสัมภาษณ์ตัวต่อตัวพบว่า ภาวะปวดศีรษะในเด็กนักเรียนจำนวน 121 คน (ร้อยละ 12.6) จำนวน 116 คน (ร้อยละ 12.1) จำนวน 9 คน (ร้อยละ 0.9) และจำนวน 7 คน (ร้อยละ 0.7) เกิดจากสาเหตุโพรงอากาศข้างจมูกอักเสบ หรือ โรคติดเชื้อทางเดินหายใจส่วนบน ปวดศีรษะไมเกรน อาการปวดศีรษะร่วมกับความดันเลือดซิสโตลิกที่ระดับขอบบนของค่าปกติ และปวดศีรษะจากความเครียด (tension-type headache) ตามลำดับ การนอนหลับที่ไม่เพียงพอ และความกังวล ปัญหาการเรียนเป็นปัจจัยหลักที่กระตุ้นให้เกิดอาการปวดศีรษะไมเกรนในนักเรียนจำนวน 25 คน และ 23 คน ตามลำดับ การขาดเรียนพบในเด็กนักเรียนที่เป็นปวดศีรษะไมเกรนจำนวน 4 คน และนักเรียน 1 คน เคยได้รับยาป้องกันการเกิดอาการปวดศีรษะไมเกรน*

สรุป: *อาการปวดศีรษะในเด็กนักเรียนมัธยมศึกษาชั้นปีที่ 1 พบได้ไม่น้อย การตระหนักถึงอุบัติการณ์ที่สูงของอาการปวดศีรษะในเด็กนักเรียน ในกลุ่มอายุนี้จะช่วยในการวินิจฉัย หรือ ระบุเด็กนักเรียนที่มีอาการปวดศีรษะได้เร็วขึ้น ซึ่งจะทำให้การให้คำแนะนำในการป้องกันการเกิดอาการ และการรักษาที่เหมาะสมต่อไป*