Pediatrics International (2009) **51**, 621–625 doi: 10.1111/j.1442-200X.2009.02804.x

Original Article

Pediatric chronic daily headache associated with school phobia

Mitsue Fujita,[1] Junko Fujiwara,[2] Takako Maki,[1] Kayoko Shibasaki,[1] Midori Shigeta[1] and Junko Nii[1]
[1]*Department of Pediatrics, Tsukuba Gakuen Hospital, Tsukuba, Ibaraki and* [2]*Graduate School of Integrated Medicine, Graduate University of Japan Traditional Medicine and Science, Tokyo, Japan*

Abstract ***Background***: Children and adolescents with school phobia sometimes complain of severe and persistent headaches that are diagnosed as chronic daily headache (CDH).
Methods: We investigated 24 children with CDH and school phobia, and 26 children with CDH but without school phobia.
Results: Of 24 children with CDH and school phobia, 4% had chronic migraine (CM), 46% had chronic tension-type headache (CTTH) and 50% had both CTTH and migraine. However, of 26 children with CDH but without school phobia, 61% had CM, 24% had CTTH, 11% had CTTH and migraine, and 4% had new daily-persistent headache. There was a significantly higher rate of CTTH and both CTTH and migraine in children with CDH and school phobia than that in children with CDH but without school phobia ($P < 0.0001$). All of the 24 children with CDH and school phobia were found to have psychiatric disorders. Of 24 children, 71% were found to have adjustment disorders, 21% were found to have anxiety disorders, and 8% were found to have conversion disorder. Of 26 children with CDH but without school phobia, only 20% were found to have psychiatric disorders. There was a significantly higher rate of psychiatric disorders in children with CDH and school phobia than in children with CDH but without school phobia ($P < 0.0001$).
Conclusions: Our study indicated that children with CDH and school phobia had problems in school and/or family and psychiatric disorders. They should be diagnosed and treated attentively not only for headaches but also for their psychosocial problems and psychiatric disorders.

Key words chronic daily headache, prognosis, psychiatric disorder, school phobia, treatment.

Chronic daily headache (CDH) is defined as a persistent experience of head pain lasting no less than 4 h for more than 15 days per month for at least 3 months, according to Silberstein's classification.[1,2] It is also defined as primary headache in the absence of organic pathology. CDH occured in 2% of middle school girls and 0.8% of middle school boys aged 12–14 years in a population-based study.[3] CDH has been shown to represent up to 34.6% of cases seen in pediatric headache specialty clinics, even though headache duration of more than 4 h was not used as a screening criterion.[4]

In adolescents, as in adults, CDH has been associated with psychiatric comorbidity[5–7] and medication overuse.[3,7] Disability in pediatric patients with CDH can be measured in terms of school absence, abstinence from after-school activities, and family discord as a result of the headache.[6] Headache can affect all aspects of a child's functioning, leading to negative affective states (e.g. anxiety, depression, anger) and increased psychosocial problems (for instance, school absences, problematic social interactions).[8]

Meanwhile, school phobia has been a serious social problem in Japanese children and adolescents during the past decade. Children and adolescents with school phobia sometimes complain of severe and persistent headaches that are diagnosed as CDH. School phobia, school avoidance, and school refusal will be used interchangeably to describe students who exhibit a pattern of avoiding or refusing to attend school.[9] They cannot be considered truants, who are identified by their lack of excessive anxiety or fear about attending school, their delinquent behaviors, and lack of interest in schoolwork.[10] School phobia is considered a kind of social phobia according to the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV).[11,12] Children and adolescents with both school phobia and CDH sometimes visit pediatric headache specialty clinics, because they think the main reason why they cannot attend school is their severe headaches. However, analgesics that are typically effective for migraine are not effective for CDH.[6] CDH, especially with emotional problems or psychiatric disorders, is intractable, but there has been little study on the clinical characteristics, treatment and prognosis of CDH in children and adolescents, and no published reports about CDH with school phobia.

The aim of this retrospective study is to investigate the headache types, the clinical features, the treatments and the prognoses of CDH associated with school phobia in our pediatric headache specialty clinic. We also examine whether CDH with school phobia is different in characteristics compared to CDH without school phobia.

Correspondence: Mitsue Fujita MD PhD, Department of Pediatrics, Tsukuba Gakuen Hospital, 2573-1, Kamiyokoba, Tsukuba, Ibaraki, 305-0854, Japan. Email: mitfujita@tulip.sannet.ne.jp

Received 10 January 2008; revised 26 October 2008; accepted 10 December 2008.

Methods

We retrospectively reviewed all charts of children aged 3–16 years presenting with chronic and/or recurrent headaches to our pediatric headache specialty clinic at Tsukuba Gakuen Hospital between October 2003 and September 2006. Fifty CDH patients (35 girls and 15 boys aged 6–16 years: 11.8 ± 2.3 years) were enrolled from 208 (115 girls and 93 boys aged 3–16 years: 11.3 ± 2.8 years) subjects with chronic and/or recurrent headaches. Of 50 children with CDH, 24 children (19 girls and 5 boys aged 8–14 years: 12.4 ± 1.4 years) had school phobia and 26 children (16 girls and 10 boys aged 6–16 years: 11.1 ± 2.8 years) had no school phobia. Twenty-four children with CDH and school phobia were studied regarding their headache types, psychosocial factors, psychiatric disorders, treatments, and prognoses, compared with 26 children with CDH but without school phobia.

CDH was defined as the occurrence of headache for at least 15 days per month for more than 3 months. Headaches were diagnosed according to the International Criteria of Headache Disorders second Edition (ICHD-II).[13] The criteria describe a migraine as an attack of pulsating and unilateral or bilateral (frontotemporal) headache with nausea and/or vomiting, and with photophobia and phonophobia, lasting 1–72 h in children, although 4–72 h in adults. The criteria of tension-type headache (TTH) is defined as bilateral pressing/tightening (non-pulsating) headache without nausea or vomiting, lasting 30 min to 7 days; the same as for adults. Psychiatric disorders were diagnosed according to the DSM-IV-Text Revision (DSM-IV-TR).[12] All children with CDH were encouraged to record their headaches and life events, such as troubles at school and/or home, in their headache diaries, which were a modified version of the diary invented by Sakai *et al.*[14,15] Their diagnoses of headaches and psychiatric disorders, if probable, were confirmed using the diaries at every interview at the clinic according to ICHD-II and DSM-IV-TR. Definition of effect in treatment and prognosis was measured by the reduction of intensity of headache and frequency, and days of attending school.

Statistical analysis

The χ^2-test was applied to compare the groups. A 5% level of significance was used. Statistical analyses were performed using Statview software version 5 (SAS institute Inc.).

Results

Of 208 children with chronic and/or recurrent headaches, 50 (24%) were diagnosed as having CDH. CDH affected eight girls and six boys in elementary school and 27 girls and nine boys in junior high school or above. There were significantly more children with CDH in junior high school or above than those in elementary school ($P < 0.0001$). Of 50 children with CDH, 24 (48%) had school phobia: 19 of 35 (54%) girls aged 12.5 ± 1.5 years and 5 of 15 (33%) boys aged 12.0 ± 0.7 years. Of 24 children with CDH and school phobia, three were in elementary school and 21 were in junior high school or above. On the other hand, of 26 children with CDH but without school phobia, 11 were in elementary school and 15 were in junior high school or above. There were significantly more children with CDH and school phobia in junior high school or above than those in elementary school ($P < 0.0001$). However, there was no significant difference in children with CDH but without school phobia between elementary school and junior high school or above (Table 1).

Of 24 children with CDH and school phobia, one (4%) had chronic migraine (CM), 11 (46%) had chronic tension-type headache (CTTH) and 12 (50%) had both CTTH and migraine according to ICHD-II[13]. However, of 26 children with CDH but without school phobia, 16 (61%) had CM, six (24%) had CTTH, three (11%) had CTTH and migraine, and one (4%) had new daily-persistent headache (NDPH) (Table 2). There was a significantly higher rate of CTTH and both CTTH and migraine in children with CDH and school phobia than in children with CDH but without school phobia ($P < 0.0001$) (Table 2). Medication-overuse headache (ICHD-II) was not displayed in this study.

The headache duration of CDH was reported continuously in 17 (71%) children with school phobia and 12 (46%) without school phobia. There were no significant differences between the two groups (Table 3).

All of 24 children (19 girls, five boys) with CDH and school phobia were found to have psychiatric disorders according to DSM-IV-TR.[12] There were significantly more girls with psychiatric disorders than boys ($P < 0.0001$). Of 24 children, 17 (71%) (14 girls and three boys) were found to have adjustment disorders, five (21%) (three girls and two boys) were found to have anxiety disorders, and two (8%) (two girls) were found to have conversion disorder. Of 17 with adjustment disorders, six also had depressed mood and nine also had anxious mood (Table 4). Of 26 children with CDH but without school phobia, only five (20%) were found to have psychiatric disorders (one with adjustment disorder, two with anxiety disorders, and two with conversion disorder), and 21 (80%) children had no psychiatric disorders. There was a significantly higher rate of psychiatric disorder in children with CDH and school phobia than in children with CDH but without school phobia ($P < 0.0001$) (Table 4).

Of 29 children with both CDH and psychiatric disorders, four were in elementary school and 25 were in junior high school or above. There were significantly more children with CDH and psychiatric disorders in junior high school or above than those in elementary school ($P < 0.0001$).

Psychosocial problems were reported in all of the 24 children with CDH and school phobia. Problems were differentiated into school problems ($n = 15$, 63%), family problems ($n = 11$, 46%), and patients' problems ($n = 4$, 17%) (Table 5). School problems

Table 1 Ages of children with CDH

Ages (School)	CDH		Cases with CDH ($n = 50$)
	Cases with school phobia ($n = 24$)	Cases without school phobia ($n = 26$)	
<Elementary	0	0	0
Elementary	3*	11	14**
Junior high or above	21*	15	36**

*$P < 0.0001$; **$P < 0.0001$. CDH, chronic daily headache.

Table 2 Headache types of CDH in children with or without school phobia

Headache types	Cases with school phobia ($n = 24$ (%))	Cases without school phobia ($n = 26$ (%))
1.5.1	1 (4)*	16 (61)*
2.3	23 (96)**	9 (35)**
[+ Mi]	[12]	[3]
4.8	0	1 (4)

*$P < 0.0001$; **$P < 0.0001$. 1.5.1, chronic migraine; 2.3, chronic tension-type headache; Mi, migraine without or with aura; 4.8, new daily-persistent headache (International Criteria of Headache Disorders second Edition); CDH, chronic daily headache.

included stress in school with peers ($n = 11$), with teachers ($n = 1$), and at club activities ($n = 3$). Bullying was identified in two cases of those who had stress with peers. Family problems included family without father ($n = 4$), disturbed family relationship ($n = 3$), mothers' psychiatric disorders ($n = 3$), and bad marital relationship ($n = 1$). Patients' problems included fear of separation from home ($n = 3$) and poor expression of rebelliousness to parents ($n = 1$).

Psychotropic medications were prescribed for 10 (59%) of 17 children with adjustment disorders, four (80%) of five with anxiety disorders, and one (50%) of two with conversion disorder (Table 6). Selective serotonin reuptake inhibitor (fluvoxamine), minor tranquilizer (etizolam, alprazolam, amitriptyline), and major tranquilizer (sulpiride) were used (Table 6) in order to improve the anxious and depressed mood of children with school phobia. Counseling for children and their parents was performed for 21 (88%) of 24 children with CDH and school phobia (Table 7). In prognoses for school, nine (37%) have attended school again regularly, 10 (42%) have attended school irregularly (such as in the nurse's office or from the afternoon), and two (8%) have still been absent (Table 7). Psychotropic medications and/or counseling were useful for mental stability and incentives to attend school again in 19 (79%) children.

Discussion

CDH includes four major categories: transformed migraines (TM), CTTH, NDPH, and hemicrania continua.[1,2] As criterion of the duration of all these four headache types was defined for more than 3 months according to ICHD-II, we used the same criterion of the duration for our study of CDH. Furthermore, headache duration was not used as a screening criterion in the study, because children may experience shorter headaches.[4] Moreover, in our study, there was no significant difference in headache duration in CDH between children with school phobia and children without school phobia. However, children with school phobia complained of a more continuous headache than those without school phobia.

Table 3 Headache duration of CDH in children with or without school phobia

Headache duration	Cases with school phobia ($n = 24$ (%))	Cases without school phobia ($n = 26$ (%))
Continuous	17 (71)*	12 (46)*
4–24 h	3 (12)	14 (54)
1–3 h	4 (17)	0

*Not significant. CDH, chronic daily headache.

Table 4 Psychiatric disorders with or without school phobia in children with CDH

Psychiatric disorders	Gender	Cases with school phobia ($n = 24$)	Cases without school phobia ($n = 26$)
Adjust	F	14	1
	M	3	0
(with depress.)	F	(6)	(0)
	M	(0)	(0)
(with anxious.)	F	(6)	(0)
	M	(3)	(1)
Anxiety	F	3	1
	M	2	1
Conversion	F	2	1
	M	0	1
No psychiatric disorders	—	0*	21 (80%)*

*$P < 0.0001$. Adjust, adjustment disorders; Anxiety, anxiety disorders; CDH, chronic daily headache; Conversion, conversion disorder (Diagnostic and Statistical Manual of Mental Disorders, 4th Edition-Text Revision); F, female; M, male; with anxious, with anxious mood; with depress, with depressed mood.

Headache types of CDH in children are not well analyzed. In recent studies, most childhood CDH was reported as migraine or migrainous.[4,16] However, in a 4-year follow-up study of CDH, headache types of CDH were classified as CTTH (34%), and both migraine and TTH (47%) according to 1988 International Headache Society criteria.[5,17] Furthermore, psychiatric disorders are notable in children and adolescents with CDH (about 64%) and predict (mainly anxiety) a less favorable outcome.[5] In a small series among children and adolescents, Gladstein and Holden described 40% of children with CDH as having a comorbid pattern that included intermittent migraines with an underlying TTH.[18] The migraines often increased in intensity and frequency, while the TTH occurred on a daily basis.[18] This study also included children with NDPH (35%), with TM (15%) and with CTTH (5%). There was no significant difference between the three diagnostic groups (comorbid, NDPH and TM), in the number of missed school days and both medical and psychological factors. Of 24 children with CDH and school phobia in our series, 46% were found to have CTTH, 50% had comorbid headache with both CTTH and migraine, and only 4% had CM similar to the above-mentioned reference.[4] However, of 26 children with CDH but without school phobia, 61% had CM, 24% had CTTH, 11% had CTTH and migraine, and 4% had NDPH. This result had no discrepancy in most children with CDH who had characteristics suggestive of CM or TM[4] in the whole group of children with CDH but without psychiatric disorders.

To our knowledge, there are no published reports about headache types and characteristics in children with school phobia (refusal). The published reports[5–7] and our study suggested that the headache categories of CDH, especially CTTH, were strongly associated with psychosocial factors, which were seen in school phobia. Moreover, in a study of psychosocial functioning in

Table 5 Psychosocial problems of children with CDH and school phobia

Psychosocial problems*	Psychiatric disorders $n = 24$			Number of problems (%)
	Adjust ($n = 17$)	Anxiety ($n = 5$)	Conversion ($n = 2$)	
School problems	10	4	1	15 (63)
Stress in school				
With teachers	1	0	0	1
With peers†	7	3	1	11
At club activities	2	1	0	3
Family problems	6	4	1	11 (46)
Disturbed family relationship	3	0	0	3
Bad marital relationship	1	0	0	1
Family without father	1	2	1	4
Mothers' psychiatric disorders	1	2	0	3
Patients' problems	4	0	0	4 (17)
Poor expression of rebelliousness to parents	1	0	0	1
Fear of separation from home	3	0	0	3

*Includes 1 or more than 1 problem. †Includes two children who were bullied. Adjust, adjustment disorders; Anxiety, anxiety disorders; CDH, chronic daily headache; Conversion, conversion disorder.

schoolchildren with recurrent headaches, children with migraine coexisting with TTH had significantly more frequent somatic complaints than those having episodic TTH.[19] School refusal in adolescence can be a symptom of a variety of disorders, particularly anxiety and mood disorder, and generally occurs in the first 2 years of high school.[20] In the present study, there were significantly more children with CDH and school phobia in junior high school or above than those in elementary school. This suggests that adolescents are more vulnerable to psychosocial problems and psychiatric disorders than children in elementary school because of their sensitive and emotional age.

Table 6 Medications for children with CDH and school phobia

Psychiatric disorders (DSM-IV-TR)	Cases ($n = 24$)	Medications	Cases ($n = 15$)*
Adjustment disorders	17	Fluvoxamine	5
		Etizolam	5
		Alprazolam	1
		Sulpiride	1
		Amitriptyline	1
Psychotropic medications	10 (59%)		
No psychotropic medication	7 (41%)		
Anxiety disorders	5	Fluvoxamine	2
		Etizolam	3
Psychotropic medications	4 (80%)		
No psychotropic medication	1 (20%)		
Conversion disorder	2	Alprazolam	1
		Etizolam	1
Psychotropic medications	1 (50%)		
No psychotropic medication	1 (50%)		

*Includes 1 or more than one kind of medication. CDH, chronic daily headache; DSM-IV-TR; Diagnostic and Statistical Manual of Mental Disorders, 4th Edition-Text Revision.

All of the 24 children with CDH and school phobia were found to have psychiatric disorders and girls had those significantly more than boys in our study. In the study of children with CDH compared with the healthy control, female headache patients were continuing to report significantly higher levels of anxiety and depression, even though there were no significant differences for male patients.[7] Knowledge that somatic complaints such as headaches and stomachaches are commonly an expression of underlying anxiety and depression may facilitate more rapid referral for psychiatric assessment and treatment.[19]

CDH associated with school phobia is difficult to treat because of the complicated background. In the study of school refusal in adolescence, the circumstance of patients with school refusal included conflict at home (43%), conflict with peers (including bullying) (34%), academic difficulties (31%), family separation (21%), and others. Maternal history of psychiatric illness was reported in about half of the patients.[20] Being bullied is strongly associated with a wide range of psychosomatic symptoms such as headache.[21] However, it can be very difficult to find out about bullying because often children do not want to tell their teachers and parents that they are being bullied. Physicians should consider carefully if stress with peers might include bullying, when children complain of severe and persistent headaches.

In the present study, counseling for children and their parents was performed for 88% as psychological therapy. In the prognoses for school, 79% have attended school again regularly or irregularly. In the meta-analysis regarding the evidence of the efficacy of relaxation, biofeedback, and cognitive-behavioural intervention, the efficacy of psychological treatment in pediatric headache patients is corroborated on evidence level 1a.[22] These psychological treatments are expected in CDH-associated school

Table 7 Counseling and prognoses of children with CDH and school phobia

Psychiatric disorders (DSM-IV-TR)	Cases	Counseling*	Prognoses for school			
			Attend	Modified at	Absent	Unknown†
Adjustment disorders	17	15	6	7	2	2
Anxiety disorders	5	4	3	1	0	1
Conversion disorder	2	2	0	2	0	0
Total cases (%)	24	21 (88)	9 (37)	10 (42)	2 (8)	3 (13)

*Psychotropic medications were also used in 15 cases. †Included the cases followed up in other hospitals. Attend, attend school regularly; DSM-IV-TR; Diagnostic and Statistical Manual of Mental Disorders, 4th Edition-Text Revision; modified at, attend school irregularly such as in the nurse's office or from the afternoon.

phobia. However, these interventions were not available in our study, because of the lack of staff who specialized in the field as psychotherapy. Children with CDH and school phobia should expect a collaborative team that includes a physician, school staff, a mental health professional, and their parents.[10] For a pediatrician who is working in a clinic or in a small hospital, counseling might be the one and only intervention for children who suffer from psychosocial problems.

In conclusion, our study indicated that CDH with school phobia was more intractable than CDH without school phobia because of comorbid psychiatric disorders. CTTH with or without migraine was the main headache subtype in children with CDH and school phobia. Children with CDH and school phobia had problems in school and/or the family. They should be diagnosed and treated attentively not only for headaches but also for their psychosocial problems and psychiatric disorders. They need long-term follow up by pediatricians or specialists for resolving headaches and psychosocial problems.

References

1 Silberstein SD, Lipton RB, Solomon S *et al*. Classification of daily and near-daily headaches: Proposed revisions to the IHS criteria. *Headache* 1994; **34**: 1–7.
2 Silberstein SD, Lipton RB, Sliwinski M. Classification of daily and near-daily headaches: Field trial of revised IHS criteria. *Neurology* 1996; **47**: 871–5.
3 Wang SJ, Fuh JL, Lu SR *et al*. Chronic daily headache in adolescents: Prevalence, impact, and medication overuse. *Neurology* 2006; **66**: 193–7.
4 Hershey AD, Powers SW, Bentti AL *et al*. Characterization of chronic daily headaches in children in a multidisciplinary headache center. *Neurology* 2001; **56**: 1032–7.
5 Galli F, Patron L, Russo PM *et al*. Chronic daily headache in childhood and adolescence: Clinical aspects and a 4-year follow-up. *Cephalalgia* 2004; **24**: 850–8.
6 Mack KJ, Gladstein J. Management of chronic daily headache in children and adolescents. *Pediatr. Drugs* 2008; **10**: 23–9.
7 Pakalnis A, Butz C, Splaingard D *et al*. Emotional problems and prevalence of medication overuse in pediatric chronic daily headache. *J. Child Neurol*. 2007; **22**: 1356–9.
8 Powers SW, Gilman DK, Hershey AD. Headache and psychological functioning in children and adolescents. *Headache* 2006; **46**: 1404–14.
9 Tyrrell M. School phobia. *J. Sch. Nurs*. 2005; **21**: 147–51.
10 Fremont WP. School refusal in children and adolescents. *Am. Fam. Physician*. 2003; **68**: 1555–60.
11 Ginsburg GS, Grover RL. Assessing and treating social phobia in children and adolescents. *Pediatr. Ann*. 2005; **34**: 119–27.
12 American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, 4th edn. text revision (DSM-IV-TR). American Psychiatric Association, Washington, 2000.
13 Headache Classification Committee of the International Headache Society. The International Classification of Headache Disorders, 2nd edn. *Cephalalgia* 2004; **24**(Suppl. 1): 1–159.
14 Sakai F, Dobashi K, Igarashi H. Assessing new migraine therapies in Japan. *Cephalalgia* 1999; **19**(Suppl. 23): 9–14.
15 Fujita M, Fujiwara j, Maki T *et al*. Validity of graphic headache diary for children. *Cephalalgia* 2008; **28**: 457 (Abstract).
16 Koenig MA, Gladstein J, McCarter RJ *et al*. Chronic daily headache in children and adolescents presenting to tertiary headache clinics. *Headache* 2002; **42**: 491–500.
17 Headache Classification Committee of the International Headache Society. Classification and diagnostic criteria for headache disorders, cranial neuralgias and facial pain. *Cephalalgia* 1988; **8**(Suppl. 7): 1–96.
18 Gladstein J, Holden EW. Chronic daily headache in children and adolescents: A 2-year prospective study. *Headache* 1996; **36**: 349–51.
19 Carlsson J, Larsson B, Mark A. Psychosocial functioning in school children with recurrent headaches. *Headache* 1996; **36**: 77–82.
20 McShane G, Walter G, Rey JM. Characteristics of adolescents with school refusal. *Aust. N.Z.J. Psychiatry* 2001; **35**: 822–6.
21 Fekkes M, Pijpers FIM, Verloove-Vanhorick SP. Bullying behavior and associations with psychosomatic complaints and depression in victims. *J. Pediatr*. 2004; **144**: 17–22.
22 Trautmann E, Lackschewitz H, Kröner-Herwig B. Psychological treatment of recurrent headache in children and adolescents: A meta-analysis. *Cephalalgia* 2006; **26**: 1411–26.