

CK Kong 江志強  
WW Cheng 鄭蕙蕙  
LY Wong 黃勵燕

# Epidemiology of headache in Hong Kong primary-level schoolchildren: questionnaire study

## 香港小學生中頭痛的流行病學：問卷研究

**Objective.** To collect and analyse epidemiological data on childhood headache in the Hong Kong community.

**Design.** Questionnaire study.

**Setting.** Three primary schools, Hong Kong.

**Participants.** Two thousand one hundred and twenty pupils from 2156 replies to the questionnaire survey. One hundred and twenty-four pupils who were identified to have suspected recurrent headache were invited to a follow-up medical consultation.

**Main outcome measures.** Age-groups and prevalence of tension-type and migraine headache, using the diagnostic criteria of the International Headache Society.

**Results.** The overall prevalence of headache in the 2120 respondents was 2.8%. The prevalence of tension-type headache, migraine, probable migraine, and unclassified headache were 1.2%, 0.5%, 0.7%, and 0.5%, respectively. The age-specific prevalence of headache from the age of 6 to 13 years showed a steadily increasing trend from childhood to the early teens.

**Conclusion.** Headache is a common complaint for children, although it may be underrecognised. Further study will be beneficial for providing better management of headache in this population.

### Key words:

Child;  
Headache/epidemiology;  
Incidence;  
Migraine;  
Prevalence;  
Tension headache

### 關鍵詞：

兒童；  
頭痛 / 流行病學；  
影響範圍；  
偏頭痛；  
流行；  
緊張型頭痛

**目的：**收集及分析在香港社會中孩童時期頭痛的流行病學數據。

**設計：**問卷研究。

**安排：**香港；三所小學。

**參與者：**從 2156 份問卷中的 2120 名小學生，其中 124 名被懷疑患有週期性頭痛，被邀進行隨後的醫療諮詢。

**主要結果測量：**利用國際頭痛協會(International Headache Society)的診斷標準，緊張型頭痛及偏頭痛的年齡組別及流行率。

**結果：**在 2120 名小學生中，頭痛的總流行率為 2.8%，其中緊張型頭痛，偏頭痛，可能偏頭痛，無分類頭痛的流行率分別是 1.2%，0.5%，0.7% 和 0.5%。從 6 到 13 歲，與年齡相關的頭痛流行程度呈穩定增加的趨勢。

**結論：**儘管人們認識不足，頭痛是兒童常見的病。進一步的研究將會對這群體提供更好的醫治頭痛的方法。

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Department of Paediatrics, Caritas Medical Centre, 111 Wing Hong Street, Shamshuipo, Hong Kong

CK Kong, MB, ChB, FHKAM (Paediatrics)  
WW Cheng, MB, ChB, FHKAM (Paediatrics)  
LY Wong, MB, ChB, FHKAM (Paediatrics)

Correspondence to: Dr CK Kong

## Introduction

A number of studies in western countries have investigated the epidemiology and characteristics of childhood headache.<sup>1-5</sup> Headache has been shown to be a relatively common disorder. Since data on childhood headache in

**Table 1. Diagnostic criteria for tension-type and migraine headache (adapted from the International Headache Society<sup>6</sup>)**

Tension-type headache	Migraine headache
A. At least 10 previous headaches fulfilling criteria below	A. At least 5 attacks fulfilling criteria below
B. Headache lasting from 30 minutes to 7 days	B. Headache lasting 4 to 72 hours (2 to 48 hours in children)
C. At least 2 of the following pain characteristics:	C. Headache characterised by at least two of the following:
1. Pressing (non-pulsating) quality	1. Unilateral location
2. Mild or moderate intensity (may inhibit, but does not prohibit activities)	2. Pulsating quality
3. Bilateral location	3. Moderate or severe intensity (inhibits or prohibits daily activity)
4. No aggravation by walking stairs or similar routine physical activity	4. Aggravated by climbing stairs or similar routine physical activity
D. Both of the following:	D. Headache accompanied by at least one of the following:
1. No nausea or vomiting	1. Nausea or vomiting, or both
2. Photophobia and phonophobia are absent, or only one is present	2. Photophobia and phonophobia

Hong Kong is lacking, the purpose of this preliminary study was to collect epidemiological data on childhood headache in the local community.

## Methods

Three primary schools in the Shamshuipo district of Hong Kong were invited to participate in the study. Questionnaires written in Chinese were distributed to pupils at these schools to determine whether they had had at least two headaches in the past 6 months (在過去半年曾有/沒有[圈出答案]兩次超過半小時頭痛的情況). Parental signature was required at the end of the questionnaire. Those children who responded that they had had at least two headaches in the past 6 months were contacted by telephone and invited to attend a medical consultation at the Caritas Medical Centre. There, the children were seen by one of the three authors. Details of their headaches were gathered using a standard check-list. Physical examination was then performed to look for secondary causes of headache, with particular attention to focal neurological signs, blood pressure, and fundi.

Headaches were classified as tension-type, migraine, probable migraine, and unclassified. Tension-type headache and migraine were classified according to the criteria of the International Headache Society (Table 1).<sup>6</sup> Probable migraine was diagnosed when the headache fulfilled all but one of the B to D criteria for migraine. Unclassified headache was diagnosed when the headache was considered to be primary, but did not fall into any of the above mentioned categories.

## Results

Questionnaires were distributed to 2156 pupils in the three primary schools. Questionnaires were sent to and collected from the first school in January 1999, followed by the second one in April 1999 and the third one in October 1999. From these pupils, 2120 questionnaires were collected, giving a response rate of 98.3%. The respondents' ages ranged from 5 to 16 years. Most of the pupils (2042/2120; 96.3%) were aged between 6 and 13 years. There were 1115 boys and 1005 girls. One hundred and ninety-five pupils reported at least two headaches during the past 6 months, of whom 185 were able to be contacted by telephone. Sixty-one pupils were excluded, as they were judged to have incorrectly reported headaches or their headaches were associated with infection or acute illness. One hundred and twenty-four pupils were invited to a consultation at the Caritas Medical Centre, of whom 114 subsequently presented for consultation. All pupils were contacted or seen within 3 months after collection of the questionnaires.

Sixty children were identified as having genuine recurrent headache after consultation. The overall prevalence of headache was 2.8% (95% confidence interval [CI], 2.1-3.5). There were 25 children with tension-type headache, 11 with migraine, 14 with probable migraine, and 10 with unclassified headache. No cases of recurrent headache with a secondary cause were found in this study, although diagnosis based on only one consultation may not be accurate. The overall prevalence of tension-type headache, migraine,

**Table 2. Age-specific prevalence of headache in children responding to the questionnaire**

Age (years)	No. of children responding	No. of children in whom headache was diagnosed	Prevalence (%)
6-7	409	5	1.2
8-9	562	12	2.1
10-11	746	22	2.9
12-13	325	18	5.5

**Table 3. Characteristics of different types of childhood headache**

	T*	M†	PM‡	M+PM§
<b>Common onset time</b>				
Night time	3	2	0	2
On rising	3	3	3	6
Afternoon or evening	15	5	7	12
Any time	4	2	5	7
<b>Headache character</b>				
Throbbing/pulsating	5	4	6	9
Sharp/stabbing	1	0	1	1
Tightness/pressing	9	3	3	6
Heaviness	8	3	5	8
Unknown	2	1	0	1
<b>Location</b>				
Whole head	5	0	2	2
Unilateral	7	7	10	17
Either side	5	4	6	10
Always same side	2	3	4	7
Bilateral	9	4	2	6
Vertex	3	0	0	0
Frontal	8	5	4	9
Temporal	6	5	5	10
Occipital	4	1	3	4
<b>Intensity</b>				
Mild	9	0	1	1
Moderate	14	7	6	13
Severe	2	4	7	11
<b>Family history</b>				
	11	7	10	17
<b>Associated symptoms</b>				
Nausea	1	9	8	17
Vomiting	0	6	2	8
Abdominal pain	2	3	3	6
Pallor	3	6	6	12
Sweating	1	2	2	4
Dizziness	11	5	7	12
Anorexia	9	6	8	14
Phonophobia	2	5	3	8
Photophobia	0	3	3	6
Others	1	0	0	0
None	8	0	1	1
<b>Precipitating factors</b>				
Stress	7	1	4	5
Excitement (eg holidays)	0	0	1	1
Tiredness	4	0	0	0
Physical exertion	2	1	1	2
Infection	7	2	5	7
Food	0	0	0	0
Missing meal	3	0	1	1
Sleep deprivation	9	3	5	8
Weather	1	1	2	3
Others	0	0	0	0
None	5	5	4	9
<b>Sick leave in past year (no. of children)</b>				
Yes	1	4	2	6
No	24	7	12	19
<b>Consultation in past year (no. of children)</b>				
Yes	7	5	2	7
No	18	8	10	18

\*T tension-type

†M migraine

‡PM probable migraine

§M+PM migraine and probable migraine

probable migraine, and unclassified headache were 1.2% (95% CI, 0.7-1.6), 0.5%, 0.7%, and 0.5%, respectively. For reasons discussed below, children with migraine and probable migraine were grouped together, giving a prevalence of migraine of 1.2% (95% CI, 0.7-1.6). The age-specific prevalence of headache in respondents aged from 6 to 13 years is shown in Table 2.

### Tension-type headache

A summary of the characteristics of tension-type headache in the children surveyed is included in Table 3. The median age of onset was 8 years. The mean frequency of headache was 18 headaches per year (range, once every 3 months to twice per week). The mean duration of headache was approximately 3 hours (range, 30 minutes to 1.5 days). Most headaches were of moderate intensity. Only two children had severe headache. The headache occurred most commonly in the afternoon or evening and was most frequently located at the bilateral frontal or temporal regions. Dizziness and anorexia were the two most commonly associated symptoms. Other associated symptoms were uncommon. The three most common precipitating factors were sleep deprivation, stress, and infection. Rest, sleep, and the use of simple analgesics were the most common ways to relieve pain. Decreased activity was noted in some children before (prodrome) and after (postdrome) headache. More than one quarter (7/25; 28%) of the children had consulted a doctor for headache in the past year and almost half (11/25; 44%) had a family history of headache.

### Migraine and probable migraine

Table 3 summarises the characteristic features seen in migraine headaches among the schoolchildren studied. There were close similarities between migraine and probable migraine. This finding was not unexpected, because probable migraine was defined as fulfilling all but one of the B to D migraine diagnostic criteria (Table 1). The most common unfulfilled criterion in the probable migraine group was headache duration, which was seen in nine children. Five children had a headache duration of up to 1 hour, whereas for the remainder, the duration was 30 minutes or less. Four children did not fulfill criterion D due to the absence of nausea, vomiting, photophobia, and phonophobia. One child experienced photophobia, but not phonophobia, nausea, or vomiting. Two of the five children who failed criterion D had abdominal pain. Since migraine and probable migraine showed close similarities, they were grouped together as 'childhood migraine' in the following result summaries.

In keeping with tension-type headache, the median onset age of childhood migraine was 8 years, and the mean frequency was 18 per year (range, once every 3 months to twice per week). The mean duration of headache was approximately 4 hours (range, 10 minutes to 1.5 days). Most children had headache of moderate (13/25; 52%) or severe (11/25; 44%) intensity. The headache occurred most commonly in the afternoon or evening. It was often described as throbbing in character. However, it was also commonly described as a feeling of tightening, pressing, or heaviness. Approximately two thirds (17/25; 68%) of the children had lateralised headache, whereas the others appeared to have bilateral or generalised headache. Frontal and temporal regions were the most commonly affected. Associated symptoms were much more common compared with tension headache. Nausea, anorexia, pallor, and dizziness were commonly associated symptoms. Sleep deprivation, infection, and stress, were common precipitating factors. No children reported food to be a precipitating factor. Rest, sleep, and the use of simple analgesics were common ways to relieve pain. Aura was present in three (12%) children, all of whom had photopsia. Before headache (prodrome), approximately one quarter of the children experienced decreased activity. A similar proportion of children reported decreased activity or anorexia after the headache (postdrome). More than one quarter (28%) of the children had consulted a doctor for headache in the past year, whereas 68% had a family history of headache.

### Unclassified recurrent headache

There were 10 children with unclassified recurrent headache. One failed to describe the characteristics of the headache and hence proper classification was not possible. Two had features of tension-type headache but had had fewer than 10 episodes so far. In the future, it is probable that they would meet all the diagnostic criteria for tension-type headache. Four children fulfilled all but one of the criteria for tension-type headache; two had nausea, one had aura, and one had both nausea and aura. All had generalised or bilateral headache. The remaining three children appeared to have migraine but had a headache duration of 1 hour or less and no nausea, vomiting, photophobia, or phonophobia. One child reported abdominal pain as an associated symptom.

### Discussion

Headache is a common complaint for children, although it may be underrecognised. The prevalence

of headache as reported by various studies is variable. In this study, the prevalence of recurrent primary headache was 2.8%. This percentage is low compared with that reported in most western studies.<sup>1-5</sup> A community-based study that was conducted in Hong Kong with subjects aged 15 years and older estimated the prevalence of tension headache, migraine, and unclassified headache to be 1.5%, 3%, and 0.4%, respectively.<sup>7</sup> These figures indicate an overall prevalence for recurrent headache of 5%. The prevalence of migraine was noted to be lower than that of western communities but higher than that of mainland China.<sup>7</sup> Figures from this study seem to be in accordance with the results of the earlier local study. When the data of the children aged 6 to 13 years were stratified by age, the recurrent headache prevalence increased steadily from 1.2% in the 6- to 7-year age group, to 5.5% in the 12- to 13-year age group. The prevalence of recurrent headache hence seemed to increase with age, reaching adult levels by the teenage years.

The diagnostic criteria for childhood migraine seem rather stringent and modifications may be required as has been suggested by Seshia and Wolstein.<sup>8</sup> A minimal headache duration of 2 hours for the diagnosis of migraine, for example, seems too long. Duration of at least 1 hour appears to be a more appropriate requirement. Five (36%) of 14 children in the probable migraine group would fall into the typical migraine group category with this modification. Abdominal pain has been suggested as an acceptable symptom for the diagnosis of migraine in addition to nausea and vomiting. Two (14%) further children in the probable migraine group would be classified as having migraine with this modification. It has been suggested that the requirement for both photophobia and phonophobia to be present for the diagnosis of migraine should be modified to the presence of either photophobia or phonophobia. Of the 25 children with probable or typical migraine, only three had both photophobia and phonophobia. Most of these children passed criterion D due to nausea and/or vomiting. Photophobia or phonophobia were seen in 11 of the 25 children with typical or probable migraine. Photophobia was absent in all 25 children, and phonophobia was present in only two of the 25 children with tension-type headache. Hence, it seems appropriate to accept the presence of either photophobia or phonophobia rather than the presence of both as a requirement for the diagnosis of childhood migraine.

In western studies, approximately one quarter to one third of children with migraine had an associated aura.<sup>2-5</sup> In this study, aura appeared less frequently and



was seen in only approximately one eighth of the children. Food is often mentioned as one of the precipitating factors for childhood migraine in western societies. Food, however, was not a precipitating factor for any of the children with migraine in this study.

Clinicians often see parents who are perplexed by the occurrence of headache in young children. This study shows that headache is actually fairly common in children. A proportion of these children may have to consult doctors and some may have to take sick leave. Since headache intensity is more severe in migraine, those children with migraine are more likely to require sick leave (Table 3).

This is probably the first study conducted in Hong Kong on recurrent childhood headache. The response rate in this study was good, and hence the results would appear reliable. Since the study was carried out exclusively in the Shamshuipo district of Hong Kong, applying these results to Hong Kong children in general may not be appropriate. Children in different districts, in different socio-economic classes, and in different age distributions may report different prevalence figures. Nevertheless, this study provides

initial insights into this common childhood neurological problem. Further studies will clarify the picture and help us to provide better care for this population.

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## ***Hong Kong Medical Journal* Editorial Peer Review Audit 2000**

In 2000, the Editorial Office received 126 manuscripts. Of these:

- (1) six (5%) were rejected without external review;
- (2) 40 (32%) were rejected after peer review (median time taken, 48.5 calendar days); overall rejection rate, 37%;
- (3) 69 (55%) have so far been accepted for publication (acceptance rate for unsolicited manuscripts, 47%);
- (4) 35 (28%) were published in 2000; and
- (5) 23 (18%) were invited (acceptance rate, 91%).

In the 2000 volume of the *Hong Kong Medical Journal*, there were 76 published manuscripts. Of these:

- (1) three (4%) were reviewed by one referee, 47 (62%) were reviewed by two referees, and 13 (17%) were reviewed by more than two;
- (2) 13 (17%) did not undergo external review (eg letters to the Editor and editorials); and
- (3) 30 (39%) were accepted after one round of review and revision, 25 (33%) required two rounds of review, and eight (11%) required more than two rounds of review.

One hundred and eight referees from the 274 referees available peer reviewed manuscripts for the 2000 volume; each referee handled a mean of 1.3 manuscripts. The median time taken:

- (1) to acknowledge the receipt of a manuscript was 2.5 calendar days;
- (2) for the first round of review (which included finding substitute referees) was 37 days, and the mean time taken for each referee to do the initial review was 27 days; and
- (3) from acknowledgement to acceptance (including all revisions and reassessments) was 181 days, and the median time taken from acceptance to publication was 168 days.