

Luca Gallelli  
Rosario Iannacchero  
Enzo De Caro  
Francesco Peltrone  
Manuela Colosimo  
Giovambattista De Sarro

## A questionnaire-based study on prevalence and treatment of headache in young children

Published online: 20 July 2005

L. Gallelli (✉) • M. Colosimo • G. De Sarro  
Clinical Pharmacology and  
Pharmacovigilance Unit,  
Department of Experimental and Clinical  
Medicine, Faculty of Medicine,  
University “Magna Graecia” of Catanzaro,  
Via T. Campanella 115,  
I-88100 Catanzaro, Italy  
e-mail: [luca\\_gallelli@hotmail.com](mailto:luca_gallelli@hotmail.com)  
Tel.: +39-0961-712322  
Fax: +39-0961-774424

R. Iannacchero • E. De Caro • F. Peltrone  
Regional Headache Research Center,  
Azienda Ospedaliera “Pugliese-Ciaccio”,  
Via Pio X, I-88100 Catanzaro, Italy

**Abstract** Headache occurs in a large proportion of young students. In this study we evaluated the incidence of headache in young people, examined associated factors and described the drug therapy used. A structured questionnaire was directly administered to 2700 students of secondary schools of Catanzaro. We recorded that headache symptoms started between 9 and 12 years of age. The incidence density was higher in people living in the city (84%) and in tobacco and alcohol users than non-users ( $p < 0.01$ ). The most common drugs used were non-steroidal anti-inflammatory drugs. In 20% of people, this treatment induced the development of chronic headache. These data

showed that morbidity from headache is often unrecognised and undertreated. Better management of headache symptoms and therapy could reduce the frequency of headache episodes, with a reduction of adverse drug reactions.

**Key words** Headache • Students • Questionnaire

### Introduction

Headache is a common symptom in hospital practice. Causes include migraine and tension headache as well as headache secondary to intracranial and extracranial infections, intracranial mass lesions, and head or neck trauma [1]. Headache occurs in a large proportion of young students and prevalence increases with age [2–4]. In addition, by the age of 5, 25% of children have had a notable headache, a proportion that increases to 75% by the age of 15 [5, 6].

The lifetime prevalence of headache increases from 47.2% in 7–9-year-old children to 69.5% in 13–15-year-old children [3, 4, 7].

There are not many reports on the effects of individual and social factors on the incidence of headache in young people. Therefore, in this study we evaluated the incidence of headache in young people, examined associated factors and described the drug therapy used.

### Methods

The target population consisted of all 14–18-year-old students in the city of Catanzaro, Italy.

This study was conducted in two phases. The first phase was started in November 2003 and finished in January 2004. In this

phase, a detailed questionnaire about the occurrence and frequency of headache was administered to 2700 students. In addition to personal data, participants were asked whether they had experienced at least one headache that was not caused by a head injury, pregnancy or acute illness.

After the analysis of the answers to questionnaires, in May 2004 the second phase of the study was performed, and a more detailed questionnaire was directly administered only in children who referred headache during the first phase. In this phase, detailed questions were asked regarding their type of headache, occurrence and frequency of headache (chronic headache was defined if headache was >15 days/month), risk factors for onset of headache, the influence of physical activity upon their headache, and the presence of nausea, vomiting or photophobia or of other neurological symptoms. Moreover, the questionnaire included questions about the occurrence of headache in family members, presence of humour disturbances during headache and sociodemographic and school-related factors. Sociodemographic factors included basic education, vocational education, use of licit or illicit drugs, smoking or alcohol use and socioeconomic status of the parents. School-related factors included school phobias, fear of teachers, fear of failure, bullying at school, loneliness at school, behaviour problems and learning difficulties. Moreover, we recorded also information regarding drugs used to treat headache manifestations and the development of adverse drug reactions during this treatment.

## Results

A total of 90 children were absent from school for non-headache reasons or were occasionally untraceable for other reasons during the study.

We recorded in our group that a significant number of children had suffered of headache (73.3%) and within this group, without sex differences, about the 65% presented the first episode in the 10–12 age range. A significant difference in family history of headache or environment-related factors was found between people with headache compared to people without ( $p < 0.01$ ). The incidence of recurrent headache was higher in people living in the city (84%) than in the countryside (16%) and in tobacco and alcohol users than non-users ( $p < 0.01$ ) (Table 1). There was no association between the number of days students missed classes and the severity of the headache. No gender difference was found in headache-associated disability. Headache intensity was higher during the school examination periods. Self-medication was reported by 59% of students with headache, while 27% used medications prescribed by family doctors (data not shown). The most common drugs used were non-steroidal anti-inflammatory drugs (i.e., nimesulide and acetyl salicylic acid) (Table 2).

**Table 1** Characteristics of all children with headache enclosed in this study

Variable	<i>n</i>	Percentage
Sex		
Female	1530	77.3
Male	450	22.7
Family number components	4.5	
Living		
City	1665	84
Country	315	16
Tobacco use		
Yes	1320	66.6
No	660	33.4
Alcohol use		
Yes	1550	78.3
No	430	21.7
Humour disturbances during headache		
Yes	1360	68.7
No	620	31.3
Number of headache manifestations in last month		
1	697	35.2
2–4	813	41.1
>5	470	23.7
Number of headache manifestations in last year		
1–2	446	22.5
3–5	522	26.4
>5	1012	51.1

**Table 2** Drugs used during headache manifestations

Drugs	<i>n</i>	Percentage
None	267	13.5
Nimesulide	627	31.7
ASA	547	27.6
Metimazole sodium	319	16.1
Paracetamol	130	6.6
Ergotamine derivatives	30	1.5
Others	60	3

In 75% of children, this treatment resolved the acute manifestations but in 20% it induced the development of chronic headache.

## Discussion

In this study, using two questionnaires, we compared the characteristics of children with headache with respect to children without headache, and documented the characteristics of children affected by headache. It is well known that the prevalence of headache increases with age in children [2–4]. We documented that a significant number of children began to present with headache and headache symptoms between 10 and 12 years old.

In previous studies, the low socioeconomic status of parents has been associated with headache in children [8, 9]. In contrast, Aromaa et al. [10] showed that the occurrence of headache was increased in women of higher socioeconomic status. Our results are in agreement with this study; in fact we documented that higher socioeconomic status (i.e., parents working and living in the city) and using alcohol or cigarettes may be associated with the development of headache.

Parents with higher socioeconomic status may expect good results from their children in school. These high expectations could cause stress and provoke the occurrence of headache in children.

Moreover, the start of school appears to increase significantly the incidence density of overall headache, and this is in agreement with a previous study of Anttila and coworkers [5]. In fact, as previously reported [9], bullying in school, problems in interaction with other children and stress in school were associated with headache in children.

Previously, it has been documented that drugs used for the treatment of headache include both non-specific (i.e., aspirin, acetaminophen) [11] and specific treatments (i.e., ergotamine, dihydroergotamine and the triptans) [12]. In agreement, we recorded that the most common drugs used during headache attacks were represented by non-steroidal anti-inflammatory drugs, and only in a small percentage of patients did we record treatment with ergotamine or triptans. None of the children with headache had preventive treatment, and this could be responsible for the development of chronic headache. In fact, it has been well documented that preventive treatment should be considered if headaches occur three to four days per month, and it should be seriously considered if the patient has five or more attacks per month [13]. In our study, we documented that in 78% of children drug treatment resolved the acute manifestations but in about 20% it induced the development of chronic headache (headache >15 days/month). Analgesic overuse might be a significant predictor of persistent chronic daily headache. A plausible explanation of this phenomenon could be that overuse of analgesics may induce alterations in nociceptive neural networks, which also would apply for those with chronic headache [14, 15]. In conclusion, these data could confirm the findings of other population groups that morbidity from headache is often unrecognised and undertreated. Therefore, better management of headache symptoms and therapy could reduce the frequency of headache episodes, with a reduction of adverse reactions.

**Acknowledgements** All students enrolled in this study are gratefully acknowledged for their help. Special thanks go to Prof. A. Vitale, headmaster of Liceo Classico “P. Galluppi” of Catanzaro, Prof. G. Scopelliti, headmaster of Istituto Tecnico Commerciale “L. Einaudi” of Catanzaro and the teaching staff of both schools.

## References

- Hockaday JM (1991) Migraine in children. *Matern Child Health* 16:246–247
- Borge AIH, Nordhagen R, Moe B et al (1994) Prevalence and persistence of stomach ache and headache among children. Follow-up of a cohort of Norwegian children from 4 to 10 years of age. *Acta Paediatr* 83:433–437
- Bille B (1962) Migraine in school children. A study of the incidence and short-term prognosis, and a clinical, psychological and encephalographic comparison between children with migraine and matched controls. *Acta Paediatr Scand* 51:1151
- Sillanpaa M, Anttila P (1996) Increasing prevalence of headache in 7-year-old schoolchildren. *Headache* 36:466–470
- Anttila P, Metsahonkala L, Sillanpaa M (1999) School start and occurrence of headache. *Pediatrics* 103:e80

6. Aromaa M, Sillanpaa ML, Rautava P et al (1998) Childhood headache at school entry: a controlled clinical study. *Neurology* 50:1729–1736
7. Sillanpaa M (1983) Changes in the prevalence of migraine and other headaches during the first seven school years. *Headache* 23:15–19
8. Sillanpaa M, Piekkala P, Kero P (1991) Prevalence of headache at preschool age in an unselected child population. *Cephalalgia* 11:239–242
9. Metsahonkala L, Sillanpaa M, Tuominen J (1998) Social environment and headache in 8- to 9-year-old children: a follow-up study. *Headache* 38:222–228
10. Aromaa M, Sillanpaa M, Rautava P et al (1993) Prevalence of frequent headache in young Finnish adults starting a family. *Cephalalgia* 13:330–337
11. Welch KMA (1993). Drug therapy of migraine. *N Engl J Med* 329:1476–1483
12. Goadsby PJ, Olesen J (1996) Diagnosis and management of migraine. *BMJ* 312:1279–1283
13. Goadsby PJ, Lipton RB, Ferrari MD (2002) Migraine, current understanding and treatment. *N Engl J Med* 346:257–270
14. Srikiatkachorn A, Tarasub N, Govitrapong P (2000) Effect of chronic analgesic exposure on the central serotonin system: a possible mechanism of analgesic abuse headache. *Headache* 40:343–350
15. Tepper SJ, Dodick DW (2002) Debate: analgesic overuse is a cause, not consequence of chronic daily headache. *Headache* 42:543–554