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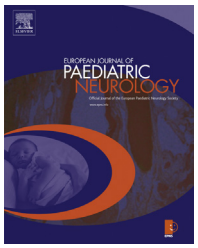
Official Journal of the European Paediatric Neurology Society



Original article

Age-related prevalence and features of migraine headache in Hungarian schoolchildren and adolescents

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ARTICLE INFO

Article history:
Received 13 October 2012
Received in revised form
5 May 2013
Accepted 9 May 2013

Keywords:
Migraine
Schoolchildren
Prevalence
Symptoms
Brain maturation

ABSTRACT

Background: Differences occur in certain features of childhood and adult migraine, such as the duration and location. However, few studies have been reported of the changes in other symptoms during childhood.
Aims: The aims of this study were to establish the prevalence of migraine headache in children in Hungary, and to investigate the changes in prevalence of migraine and migraine symptoms in a wide paediatric age range.
Methods: We conducted a school-based study with the use of a questionnaire.
Results: 7361 7–18-year-old students participated. The 1-year prevalence of migraine was 12.5% (9.2% in boys and 15.4% in girls). With the criterion of a headache duration of 4 h for 15–18-year-olds and of 1 h below the age of 15, the overall prevalence decreased to 9.1%. The prevalence of migraine increased steadily from young childhood to late adolescence in both boys and girls. The frequency and duration of headache increased, whereas vomiting and nausea became less prevalent with advancing age in both genders. The prevalence of uni/bilaterality, photophobia and phonophobia increased only in girls, while that of a pulsating character did so only in boys.
Conclusions: The migraine characteristics displayed by the studied population proved similar to those experienced in other countries. The duration of headache applied in the diagnosis of migraine exerts a great impact on the prevalence data. The features of migraine change with advancing age, a situation demanding consideration in studies on migraine in children of different ages.
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1. Introduction

The prevalence of migraine has been amply investigated in adulthood, but fewer data have been published in childhood.

After 1988, the case definition in most epidemiological studies was based on the strict or modified criteria set by the International Headache Society[1] (IHS-1), but following the modifications in 2004 (International Classification of

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http://dx.doi.org/10.1016/j.ejpn.2013.05.006

Headache Disorders 2nd edition[2] – ICHD-II), a headache duration as short as 1 h and a bilateral location have been accepted in children. These changes were expected to render a higher sensitivity for this diagnostic system. However, only a few data have been published subsequently.

As the duration and location of migraine headache may differ in children and adults, the question arises of whether other characteristics also change during childhood. We set out to establish the prevalence and features of headache through the use of ICHD-II in a large sample of schoolchildren and adolescents in Hungary. We additionally analysed the prevalence of headache and the frequency of the major symptoms in various age groups among these children, in order to identify any changes that occur with advancing age.

2. Patients and methods

2.1. Study population

This cross-sectional school-based study was performed in the city of Szeged, the regional centre of South-Eastern Hungary, with 170,285 inhabitants. Of the total of 12,094 primary school pupils, all 9234 attending one of the 21 municipality-maintained schools were invited to participate. High schools were selected by a two-stage stratified cluster sampling method, which resulted in a total of 6178 pupils being invited to participate, i.e. 52% of the total.

2.2. Questionnaire

A questionnaire consisting of 37 questions was compiled. After taking birth date and gender, the children were asked if they had ever had headaches more than one time, not connected with febrile illness or head injury. Further questions concerning headache during the preceding 12 months involved the pain characteristics. The children took the questionnaires home to complete them together with their parents.

After approval had been granted by the city authorities, the school directors and the Ethical Committee of Szeged University, the study was performed in April and May, 2011.

2.3. Validation of the questionnaire data

328 randomly selected parents and students were contacted via telephone, and the headache-related questions were asked again. This revealed 83.2% sensitivity, 92.6% specificity, and 85.5% positive and 91.3% negative predictive values of the questionnaire responses.

2.4. Data analysis

For the diagnosis of migraine the ICHD-II criteria were applied. A time limit of a minimum headache duration of 1 h was set for the 7–14-year-olds. For the 15–18-year age groups, the prevalence was calculated with a minimum duration of both 1 h and 4 h. No distinction was made between migraine with or without aura. In the calculations on the headache features, a diagnosis of migraine was accepted with a minimum headache duration of 1 h in all age groups.

For statistical analyses, SSPS for Windows (version 17.0) was used. The trends of the changes in the migraine prevalence data were assessed by Poisson regression (incidence rate ratio (IRR) and 95% confidence interval (95% CI)). For comparison with the results of other authors' we performed the same calculation when sufficient data were available. The trends of the changes in frequency of various migraine features were estimated by using logistic regression (odds ratio (OR) and 95% CI), and those with significant changes were further evaluated by multiple regression analysis. For the evaluation of changes in headache frequency and duration, Pearson's chi-square test was used.

3. Results

A total of 15,412 questionnaires were distributed, and 7361 that were appropriate for evaluation were returned. The overall response rate was 48%, 56.3% from primary school pupils, most of them under 15, and 34.6% from high school pupils. 3465 (47.1%) of the respondents were boys and 3896 (52.9%) were girls (Table 1). As the overall response rate was relatively low, we compared the prevalence of migraine in the 8 primary schools with the highest response rate (70%) with that for all of the pupils of the same age: 9.3% and 9.2%, respectively.

3.1. Prevalence of migraine headache

With a minimum headache duration of 1 h, we found 917 migrainous pupils in the overall population, 318 boys and 599 girls. The overall 12-month prevalence was 12.5%: 9.2% among boys and 15.4% among girls. Migraine was more common in the high-school pupils (20.5%) than in the 7–14-year age group (9.2%).

In contrast with ICHD-II, where no age limit but 'childhood' was applied for a headache duration of 1 h, the IHS-1 classification accepted a duration of 2 h for migraine diagnosis only 'under the age of 15'. Calculation with this second approach, i.e. applying a 4-h limit over the age of 15, but accepting a duration of only 1 h under that age resulted in a significant decrease in the number of migraineurs to 668, yielding an overall prevalence of 9.1% (7.3% in boys and 10.6% in girls).

3.2. Age and gender-related prevalence

A steady increase in prevalence was found from 7 up to 18 years, both overall (IRR: 1.15, 95% CI: 1.13–1.18, $p < 0.001$), and in each gender, at a higher rate in girls (IRR: 1.20, 95% CI: 1.17–1.23, $p < 0.001$) than in boys (IRR: 1.07, 95% CI: 1.04–1.11, $p < 0.001$) (Table 1).

With the use of a minimum headache duration of 4 h for the diagnosis of migraine over the age of 14, the continuous rise in the yearly prevalence dropped abruptly at the age of 15 years, and then resumed at the previous rate (IRR: 1.16, 95% CI: 1.03–1.21, $p = 0.007$).

Most of the published studies that used the IHS-1 or ICHD-II criteria revealed a steady increase in the age-specific prevalence data (Fig. 1).[3–15] Poisson regression analysis of data

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