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Original Article

Headache Prevalence and Related Symptoms, Family History, and Treatment Habits in a Representative Population of Children in Alba, Italy



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ABSTRACT

BACKGROUND: Headache is a widespread disorder in children, but little is known about the headache prevalence in northwest Italy, on less frequent migraine equivalents, family history, and treatment habits in children. **METHOD:** This is an epidemiologic population-based study of a representative sample of children aged 3 to 11 years, conducted in Alba, Italy. We used a self-administered questionnaire to acquire information on gender, age, headache, possible migraine equivalents, family history for various diseases, and treatment habits. **RESULTS:** We distributed the questionnaire to 1152 children, and a total of 649 questionnaires were successfully completed. In the preschool age, 10.3% (seven boys and nine girls) of children suffered from headache. In school-age children, the prevalence of headache was 31.4% (75 boys and 80 girls; 27% in 6 year olds and 41% at age 9 years). We found a significant correlation between headache and abdominal pain in the entire sample and with cyclic vomiting syndrome and dizziness in school-age children only. Headache correlated significantly with a family history of headache, thyroid diseases, diabetes, hypertension, and vascular diseases. Headache was treated with drugs, primarily paracetamol, in 60 of the 171 (35%) children who reported headache and in 61% of the children with migraine; no subjects were treated with triptans. **CONCLUSIONS:** Headache is widespread in children, with a high prevalence of associated symptoms and family history for many other headache-related disorders.

Keywords: headache, children, prevalence, cyclic vomiting syndrome, paroxysmal vertigo, abdominal pain, family history, therapy
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Introduction

Epidemiologic data suggest a headache prevalence of about 30% of children aged 5 to 11 years, although the study results vary widely, with prevalence estimates of 6–60%.^{1–9} Available data indicate a progressive increase in the

frequency of migraine and headache in children aged from 3 to 11 years,^{8–12} particularly during the transition from the preschool to the elementary school period.^{13,14} A few articles describe the prevalence of headache in preschool children with variability ranging from 3% to 24% of children.^{8,9,12,14–16} Several authors report a link between headache and abdominal pain,^{8,10,14–17} cyclic vomiting syndrome (CVS),^{18,19} dizziness, and benign paroxysmal vertigo.^{20,21} Some studies record a positive family history of headache as being more prevalent in children suffering from headache.^{3,7,10,22,23} Several authors described a link between headache and

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other disorders in adulthood, such as myocardial infarction, ischemic stroke, hypertension, metabolic syndrome, and we have found interesting to study the family history also for these diseases. Only relatively few authors indicate the type of drug treatment used for headache sufferers in childhood.^{5,7,10,24–26}

Objectives

The primary aim of our population-based study was to assess the prevalence of headache in a representative group of children, aged between 3 and 11 years, living in the town of Alba (Italy).

Further aims included the assessment of signs related to headache, including any signs indicating migraine equivalents, the assessment of a family history of headache, diabetes or thyroid, and vascular disorders, and the evaluation of treatment patterns of headache in the studied population.

Methods

Study design

The study was carried out in Alba, a town in northwest Italy renowned both for its industry and its flourishing tourism. The study was conducted between 2007 and 2008. In 2007, Alba had a population of about 31,200 inhabitants, with 3869 children aged between 3 and 11 years, 1307 children (610 boys and 697 girls) attending nursery school and 2562 children (1500 boys and 1062 girls) elementary school. Schools belong to one of three school districts, and children are distributed evenly within these districts. One of the school districts, the third one, was considered to be most representative of Alba's school population and included four elementary schools and six nursery schools; this was engaged to participate in the survey; this district has a regular distribution by sex and age, it is geographically spread with 1152 children attending its schools (30% of all the children). Parents and children were asked to answer a questionnaire at home. This included information on the age and sex of each child, the headache if present, CVS, dizziness and paroxysmal vertigo, recurrent abdominal pain (RAP), and any other illnesses presented by the child. Information was also requested on treatments for disorders other than headache, and remedies, if any, applied during headache attacks. We also asked about the family history (until second generation i.e., parents and/or grandparents, aunts and/or uncles) about diseases, including headache, diabetes, thyroid disease, and myocardial infarction, ischemic stroke, and venous thrombosis. All families of children attending Alba's third school district received the anonymous questionnaire together with informed consent for use of the data collected. Questionnaires had to be returned within 1 month, and families were given the possibility of indicating their home telephone number if they wished to be contacted for specialist evaluation of their child's headache. After the collection of questionnaires and the initial assessment of all the data, we contacted all those who had expressed the desire to be contacted, and a first appointment was arranged. The appointments were free of charge and were conducted by a multi-disciplinary team of doctors including a neurologist with special experience in headache, a pediatric neurologist, an orthopedic surgeon, and an ophthalmologist. During the first appointment, a structured questionnaire was used to achieve a diagnosis of headache type and distinguish between migraine and other types of headache. Diagnostic tests were also carried out as appropriate. If a specific diagnosis requiring treatment was made, therapy was initiated as appropriate. Families who had agreed to be recontacted were called to follow-up after a year, and their initial headache diagnosis was reassessed and, if necessary, modified.

Definitions

Parents were asked to report the presence of headache if their child suffered from at least one disabling attack (if the attacks limited the child's customary activities) per month during the 6 months before the study. The diagnosis of headache type was made during the first appointment. We used the second International Classification for Headache Disorders²⁷ to define the type of headache, identifying migraine or probable migraine groups.

To identify possible migraine equivalents and signs related to headache,²⁷ we asked the relatives who completed the questionnaire to report any disabling and recurrent episodes of vomiting, RAP, episodic dizziness, or vertigo that could not be attributed to other causes, that lasted at least 4 hours, that had reduced customary daily activities, and that had occurred at least once a month over the last 6 months. Evaluation of these events was based on the international criteria for migraine equivalents²⁷ and on the Rome III criteria for functional abdominal pain and abdominal migraine²⁸.

Statistical analysis

All statistical analyses were performed using the statistical package SAS System version 9.1. Associations between sample characteristics were assessed using a log linear model and odds ratio (OR) with a 95% confidence interval (95% CI). We used the chi-square test for trend to detect an association between age and prevalence.

Authorization

The local review board authorized the study in 2006. The study was approved by the regional program for targeted research in 2006. Informed consent for personal data treatment was obtained from each relative who returned the questionnaire.

Results

The questionnaire was distributed among 1152 children attending the third school district (489 preschoolers, 163 boys and 326 girls; 663 elementary schoolers, 335 boys and 328 girls). Responders were 649 (56.3%), 155 preschool (31.7% response rate) and 494 elementary (74.5% response rate); the general clinical characteristics of the recruited population are described in [Table 1](#). In view of the difference in response rate and in daily activity (mainly playing in preschool children and studying in school children), the two school groups were analyzed separately. [Table 1](#) describes data on prevalence of headache, headache-related symptoms, and family history as a whole sample and in pre-school or school group, and [Figure](#) illustrates prevalence of headache per age and sex. [Table 2](#) describes data on headache-related symptoms and family history in relation with the presence or the absence of headache.

The preschool group

Of 155 children, 16 were reported as suffering from headache, with a prevalence of headache of 10.3% and a 95% CI (6.5–16.1%). Possible migraine equivalents were significantly more frequent in children who also complained about headache, compared with those who did not (OR, 4.4; 95% CI, 1.5–13.1), due to the substantial group of abdominal pain sufferers, statistically associated with the presence of headache (OR, 4.6; 95% CI, 1.5–13.8) ([Table 2](#)). The presence of headache was statistically associated with the presence of family history of headache (OR, 6.3; 95% CI, 1.4–28.8), whereas among the other types of family history, only the presence of family history of

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