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## Cost assessment of headache in childhood and adolescence: preliminary data

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**Abstract** Headache, and in particular migraine, is a common disturbance in childhood and adolescence. The disabling nature of headache, evident in the adult, together with its effects on family life and reduction in performance of scholastic activity, make it a disease with an elevated social economic impact. We present preliminary results of a prospective study conducted over 6 months on a population of headache sufferers in childhood and adolescence who referred to our Juvenile Neuropsychiatry Centre of the Hospital of Perugia. Our objective

was to quantify the direct and indirect costs associated with juvenile headache.

**Key words** Juvenile headache • Costs

### Introduction

Primary headache is a very common complaint in childhood and adolescence and, contrary to what one might think, is highly disabling. Given the elevated prevalence of headache, the degree of disability and the compromise in the quality of life of young patients, it is no surprise that it represents an important public health problem with considerable costs for the National Health Care System and for their families.

Until now, some studies have been published on the economic burden of headache, in particular migraine, in terms of both direct and indirect costs in the adult population, assessed as lost work and reduced work productivity during headache attacks [1–4]. Other studies have evaluated the indirect costs, which are not readily quantifiable, such as

time lost due to non-work-related activities [5] and degree of disability [6, 7]. Only a few of these studies in the adult population also considered the juvenile age group [8–10].

In contrast, studies are lacking that focus attention on childhood. Such lack of data is due in part to the scarce interest concerning juvenile headache, at least until now, and in part to the difficulty of quantifying the indirect costs in this population, in that children are not directly involved in the productivity process.

### Materials and methods

Twenty-five patients (11 M and 14 F), mean age 13 years (range 7–18), were referred to our Child and Adolescent Neuropsychia-

try Centre suffering from headache. The diagnosis of headache was made according to the ICHD-II criteria (2004): 10 patients had migraine without aura (MO); 4 migraine with aura (MA); 3 episodic tension-type headache (ETH); 4 chronic tension-type headache (CTH); 2 chronic migraine (CM); and 2 headache secondary to sinusitis.

The study analysed the direct costs of headache, represented by the expenses for paediatric and specialist visits, diagnostic testing, and symptomatic and/or prophylactic pharmacological therapy, and the indirect costs, considering the economic equivalent of lost work hours by the parents to care for their child. Moreover, in the indirect costs we also considered lost school hours by the child due to headache.

The costs of the visits and the diagnostic testing were calculated using the National Price List, the costs of prescription medicine were based on their price to the public and the economic equivalent of lost work hours was based on the National Collective Work Contract.

Data were collected by means of a "cost diary", which was distributed at the first visit along with the headache diary, in which the parents reported, in relation to the headache attacks, eventual paediatric and specialist visits or emergency department visits, therapy undertaken, lost school hours and lost work hours by the parents to care for their children.

For each child, at the end of the study period, a form was filled out with the data obtained from the "cost diary" and from the clinical chart, in which the visits and the diagnostic testing performed for the patient were reported.

## Results

The data indicate for these subjects an overall cost of € 18,614.30; the total direct cost was € 17,290, represented by visits and diagnostic testing for 92.94%, and by symptomatic and/or prophylactic pharmacological therapy for 7.06%. In Figure 1 the average costs per patient are reported. The average expense for each patient was € 691.60. An analysis of the average direct costs per patient in relation to the different types of headaches yields a greater expense per MA patient of € 802.80, of which 92.84% was due to diagnostic testing

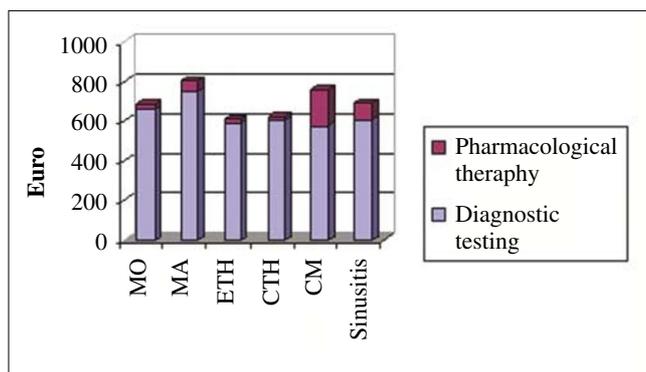


Fig. 1 Average direct costs (€) per patient

and 7.16% to drug costs, followed by CM (€ 760.50, of which 76.13% was due to diagnostic testing and 23.87% to drug costs) and headache secondary to sinusitis (€ 692, of which 87.28% was due to diagnostic testing and 12.72% to drug costs).

The total indirect cost was € 1323.30 with an average indirect cost per patient of € 52.97. Moreover, a greater number of lost work hours was recorded by the parents of the group of children affected by CM, as was a greater number of hours lost by the children in scholastic activity.

## Discussion

The preliminary data of our on-going study show how, even in childhood and adolescence, the economic costs of headache for quantifiable expenses impose a significant burden on the National Health Care System and on the families of the young headache patients.

Obviously, a larger population-based epidemiologic study on a national level is desirable to evaluate the economic impact of juvenile headache on the National Health Care System and to lay the groundwork for a rational use of resources to allocate for financing health expenditures.

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