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BRIEF COMMUNICATION

# Headache prevalence and clinical features in patients with idiopathic intracranial hypertension (IIH)

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**Abstract** Headache is a key symptom of idiopathic intracranial hypertension (IIH). Operational diagnostic criteria for "Headache attributed to IIH" are included in the international classification of headache disorders, the ICHD-2. The association of IIH with obesity was established by several reports. We investigate the prevalence of headache and its main clinical features in a clinical sample of IIH patients. The possible correlations between the presence of headache and body mass index (BMI) and intracranial pressure (ICP) levels were studied in a consecutive clinical series of patients, in whom diagnosis of IIH was confirmed by exclusion of secondary forms and by the evidence of increased ICP. Differences for age, BMI, and ICP between patients with and without headache and between males and females were assessed with Mann–Whitney *U* test. Spearman's correlation analysis was used to assess relationships between age, BMI, and ICP. *P* value $< 0.05$ was used to set statistical significance. 40 patients entered the study (9 males, 31 females; mean age 39, 8 years, SD 13.2). Headache was reported by 75 % patients. Those characteristics which are included in the present international diagnostic criteria for "Headache attributed to IIH" were reported by a remarkable proportion of the studied patients, but not by all. On the other hand, some headache features usually attributed to migraine forms, and which are not among the required criteria were present in some patients: pulsating quality and unilateral distribution of pain in around 20 %, and migrainous associated symptoms in more than 40 % of the sample. According to statistical analyses, no differences were found for age, BMI, and ICP between patients with and without headache. Our results confirmed the strong association between headache and IIH. Although no significant correlations between some of the key features of IIH were found in this study, we suggest that further studies on larger series—possibly with a longitudinal evaluation—are needed, to help clinicians in categorizing different subgroups among IIH patients as well as in identifying the main factors influencing the prognosis of this disorder.

**Keywords** Idiopathic intracranial hypertension (IIH) · Headache · Intracranial pressure (ICP) · Body mass index (BMI)

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## Introduction

The term Idiopathic intracranial hypertension (IIH) defines the syndrome of elevated intracranial pressure (ICP) in subjects without intracranial space occupying lesions and vascular disorders of intracranial vessels, and with no evidence of enlargement of the cerebral ventricles [1–3]. A diagnosis of IIH requires accurate exclusion of the above-mentioned causes, as well of other possible causative factors (metabolic, toxic or hormonal causes of intracranial hypertension), through clinical evaluations, and neuroimaging, and the demonstration of an increased intracranial pressure at lumbar puncture.

According to an US study, the prevalence of IIH in the population could be as high as 8.6/100,000 [4], while the incidence is 0.9–2.2 per 100,000, with higher figures in

young overweight women. In fact, several reports have confirmed female sex and higher body mass index (BMI) as associated factors in IIH [3, 5].

Headache is a key symptom, together with visual disturbances. Operational diagnostic criteria for "Headache attributed to IIH" are included in the international classification of headache disorders, the ICHD-2 [6]. These criteria describe headache in IIH patients as a progressive headache with at least one of three clinical characteristics: daily occurrence, diffuse and/or constant (non-pulsating) pain, and aggravation by coughing or straining. Evidence of increased ICP, with levels >200 mm $H_2O$ in the non-obese, and >250 mm $H_2O$ in the obese patients, as well as a normal CSF chemistry should be confirmed by lumbar puncture in the recumbent position or by epidural or intraventricular pressure monitoring. Patients should be alert and may exhibit various neuro-ophthalmologic alterations (papilloedema enlarged blind spot or visual field defect, sixth nerve palsy).

The aims of this study were: to investigate the prevalence of headache and its main clinical features in a clinical sample of IIH patients, to explore the possible correlations between the presence of headache and BMI or intracranial pressure (ICP) levels.

## Materials and methods

A consecutive clinical series of patients of both sex attending our Headache Center to confirm a diagnosis of IIH were studied. Inclusion criteria were: IIH suspected by clinical history and neurological evaluation and/or previous neuro-ophthalmologic evaluation; evidence of increased ICP, according to the ICHD-2 criteria [6], and of normal CSF chemistry, as demonstrated by lumbar puncture performed in the recumbent position; possible intracranial causative lesions and diseases ruled out by MRI and MRI venography. Demographic data, BMI and presence of headache and its main characteristics were systematically recorded.

Descriptive statistics were used to present data. Differences for age, BMI, and ICP between patients with and without headache and between male and females were assessed with Mann–Whitney *U* test. Spearman's correlation analysis was used to assess relationships between age, BMI, and ICP. $P$ value $< 0.05$ was used to set statistical significance.

## Results

A total of 40 patients entered the study. They were 9 males and 31 females. Mean age was 39, 8 years, SD 13.2. Headache was reported by 30 of them (75 %). When the headache features at least one of which is required for diagnosis of headache attributed to IIH according to ICHD-II were evaluated, we found that daily or nearly daily occurrence was present in 73.3 %; diffuse/non-pulsating pain was present in 80 %; aggravation by coughing/straining in 56.6 %. These three headache characteristics were present in the same patient in 36.6 % of our sample. We evaluated the presence of other clinical features, and we observed that in 26.7 % headache was pulsating, in 20 % it had a unilateral distribution, and that migrainous associated symptoms (namely, nausea or photophobia–phonophobia) were reported by 43.3 %.

Mean BMI was 29.8, SD 6.8. Mean ICP was 297.9, SD 82.9. According to statistical analyses, no differences were found for age, BMI, and ICP between patients with and without headache.

## Discussion

Our findings confirmed the strong association between headache and IIH. As far as the main headache features, those characteristics which are included in the present international diagnostic criteria [6] were reported by a remarkable proportion of the studied patients, but not by all, as more than 70 % of them had nearly daily headache and a diffuse/non-pulsating pain, and about one-half of them had aggravation by coughing/straining. We note that these three headache characteristics were present in the same patient in only about one-third of them. On the other hand, some headache features usually attributed to migraine forms, and which are not among the required criteria for "Headache attributed to IIH", were present in some patients: pulsating quality and unilateral distribution of pain in around 20 %; migrainous associated symptoms in more than 40 % of the sample. As discussed in a previous paper [7] these observations may suggest that a migraine-like presentation of headache could be rather common in IIH patients.

When the correlations between different variables were investigated in our clinical sample, we found no significant correlations between the presence of headache and the BMI or ICP levels in our sample. Although the results of the present study did not reveal significant correlations between some of the key features of IIH, we feel that the possible correlation between relevant clinical aspects (such as headache and obesity) and typical instrumental findings (ICP levels, but also neuro-ophthalmologic aspects and neuroimaging findings) deserves further investigations, and that detailed data on the features of headache in larger clinical samples could guide possible changes in the current ICDH-2 diagnostic criteria for "Headache attributed to IIH".

In conclusion, further studies on larger series—and possibly with a longitudinal evaluation after treatment interventions—are needed, to help clinicians in categorizing different subgroups among IIH patients as well as in identifying the main factors influencing the prognosis of this disorder. In fact, clear data on this topic are not available as only recently some reports have focused on the evaluation of the possible correlations between some clinical and instrumental aspects in the follow up of IIH patients [8–11].

**Conflict of interest** I certify that there is no actual or potential conflict of interest in relation to this article.

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