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## Primary headache in Emergency Department: prevalence, clinical features and therapeutical approach

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**Abstract** Headache is one of the most common reported complaints in the general adult population and it accounts for between 1% and 3% of admissions to an Emergency Department (ED). The overwhelming majority of patients who present to an ED with acute primary headache (PH) have migraine and very few of them receive a specific diagnosis and then an appropriate treatment. This is due, in part, to a low likelihood of emergency physicians diagnosing the type of PH, in turn due to lack of knowledge of the IHS criteria, and also the clinical condition of the patients (pain, border type of headache, etc.) In

agreement with the literature, another interesting aspect of data emerging from our experience is that few of the ED PH patients are referred to headache clinics for diagnosis and treatment, especially if they present with high levels of disability. This attitude promotes the high-cost phenomenon of repeater patients that have already been admitted to the ED for the same reason in the past. This is statistically important because it involves about 10% of the population with PH.

**Key words** Migrane • Emergency Department • Headache • Disability

### Prevalence

Headache is one of the most common reported complaints in the general adult population and it accounts for between 1% and 3% of admissions to emergency departments (ED) [1, 2]. Despite the fact that this symptom is very widespread and is a costly medical condition, the diagnosis of headache and its epidemiological impact in the ED has still not been completely considered. This is because most of the data collected in this field are obtained with retrospective studies. From this point of view it has been shown that the incidence of primary headache (PH) diagnosis is lower in the ED than in the general population [1–9].

In a multicentre retrospective Italian study [3] done to evaluate the prevalence of primary headache in the ED, it accounted for 0.6% of all attendances. In an observational three-month pilot study, executed by our team in 2002, we found a prevalence of 1.2% of headache complaints in the ED (unpublished data).

An unexpected aspect of the data obtained in our study was the equal prevalence of secondary (52%) and primary (48%) headache in this population.

Out of PH, migraine headache is a common presenting complaint to the ED. The prevalence of migraine diagnosis at discharge from emergency is very variable, ranging from 15 to 32% [3, 8, 9]. The majority of patients were discharged with a diagnosis of cephalalgia or headache not otherwise specified (NOS) [3, 8, 9].

The impression is that ED physicians do not use the IHS classification to diagnose headache and do not have experience in headache diagnosis and treatment.

The problem of insensitive diagnoses was attributed by Fiesseler to the application of the previous IHS criteria (1988) [10, 11], which he considered too strict for this environment, while a flexible application of these criteria could permit a higher percentage of correct diagnosis.

In fact it is important to underline that the IHS 1988 criteria often fail to delineate a unique diagnosis either because a headache fulfils criteria for more than one headache type or because a headache does not fulfil any single criteria completely. The application of “probability” category on IHS 2004 criteria, for border-type PH, is the first answer to the request of a more flexible diagnostic tool.

In our experience of a headache centre (HC) in an ED we confirm a low PH diagnosis specificity in ED. Our data show a percentage of migraine diagnosis at discharge in only 9% of patients; 84% of diagnoses of headache were NOS, while 7% were of other types of primary headache. At the first follow-up visit performed by a specialist using the IHS 2004 criteria, we found a prevalence of defined diagnosis of migraine or its complication in 74% of the population [12]. In 4.4% the diagnosis was cluster headache, in 13% secondary headache, in 2% chronic tension-type headache and in 6% a diagnosis of probable PH.

### Clinical features

Primary headaches referring to the ED are usually the ones with the most recurrent or severe attacks like migraine, chronic migraine, migrainosus status, cluster headache and TACS. As mentioned before, we have just showed there are no clear epidemiological data on the prevalence of headache in the ED. Migraine represents the most prevalent disabling form of PH in the general population and is the most prevalent form of headache also in the ED [3, 8, 9].

Among the most frequent causes of presentation to ED for PH referred to in the literature are severity of attack, headache refractory to usual treatment, migrainosus status, etc.

Data obtained by our database show that more than 50% of patients with primary headache present to our ED for an attack refractory to usual treatment (42%) or severity of attack (13.5%). Other causes found were: severity of accompanying symptoms (25%), aura disturbances (7.2%), first episode of headache (4.4%) and migrainosus status (8.4%).

Out of migraineurs diagnosed at the HC, 40% present a diagnosis of chronic migraine with an obvious high grade of disability. Analysing data on disability of the whole population referred from the ED, we have observed a high grade of MIDAS (III–IV) in more than 70% of the population at the visit, with 13 days of headache/month.

### Therapeutical approach

The management of these patients presents a therapeutic challenge in attempting to provide pain relief while minimising time spent in the ED.

A correct diagnosis of type of primary headache is the first step to start a correct therapy. But often, as previously shown, ED physicians stop the diagnosis process upon the differential diagnosis between primary and secondary headache.

Despite the availability of criteria and effective therapies for the treatment of migraines, in emergency the use of different non-specific drugs is possible, a so-called “migraine cocktail”, which permits relief of pain but not a complete return to normal function at the time of discharge [9].

This situation is due to the absence of clinical guidelines for therapy in emergency; the choice of medication is still based on personal and patient preferences, because no properly constructed trials have been carried out that would allow identification of a superior agent [13].

Among the most used medications that present some evidence of effectiveness are dopamine antagonists (antiemetics: chlorpromazine, methotrimeprazine, metoclopramide and prochlorperazine), in particular metoclopramide; serotonin receptor agonists (sumatriptan and dihydroergotamine); oral NSAIDs for relief of acute migraines that are mild to moderate in intensity; and parenteral (i.e., ketorolac) agents for severe intensity attacks [13].

Among these medications, in a recent trial Friedman has shown a comparable effect in the ED of two abortive treatments for migraine attack, such as metoclopramide and sumatriptan s.c., for reduction of pain intensity at both 2 and 24 h [14].

In our ED the use of parenteral NSAIDs is prevalent, with more than 60% of patients treated this way. In 20% a “migraine cocktail” is used, and in a smaller part of this population narcotics (8%) and diazepam (2%) are used.

With regard to a therapeutical approach, it is important to underline the absence of the habit of ED physicians to refer these patients to follow-up visits in a HC in order to start correct therapy. This is an important Achilles’ heel of the system, which presents an important economic impact on health resource utilisation, as shown by Silberstein [15].

In our hospital, before the creation of this facility, in spite of the presence of a HC, only 30% of patients were referred to an expert. Now there is a strict collaboration with the ED and all patients with headache complaints discharged with the diagnosis of primary headache are referred to our clinic and visited within 36 h. This alliance is very important for reducing healthcare costs, in particular to reduce the “repeaters” phenomenon showed by Maizels [7]. This is a very expensive cluster of patients, accessing the ED more

than three times in a period of six months. In the US experience, these are 10% of the total population, accounting for about 50% of headache-related visits to the ED. Using the same parameters, the percentage of repeaters in our population, before the creation of the HC in the ED, was 11.8%.

This collaboration has permitted obvious advantages in the management of headache patients, in particular a marked reduction on disability scale, and a contribute to reduce the “iceberg” phenomenon of migraine.

## References

1. Ward TN, Levin M, Philips JM (2001) Evaluation and management of headache in the emergency department. *Med Clin North Am* 85:971–984
2. McCaig LF, Burt CW (2003) National Hospital Ambulatory Medical Care Survey: 2001 Emergency Department Summary Division of Health Care Statistics 2003. *Advance Data No. 335* June 4
3. De Carli GF, Fabbri L, Cavazzuti L, Roncolato M, Agnello V, Recchia G (1998) The epidemiology of migraine: a retrospective study in Italian emergency departments. *Headache* 38(9):697–704
4. Maizels M (2001) Headache evaluation and treatment by primary care physicians in an emergency department in the era of triptans. *Arch Intern Med* 161(16):1969–1973
5. Salomone JA 3rd, Thomas RW, Althoff JR, Watson WA (1994) An evaluation of the role of the ED in the management of migraine headaches. *Am J Emerg Med* 12(2):134–137
6. Barton CW (1994) Evaluation and treatment of headache patients in the emergency department: a survey. *Headache* 34(2):91–94
7. Maizels M (2002) Health resource utilization of the emergency department headache “repeater”. *Headache* 42:747–753
8. Morgenstern L, Huber CH, Luna-Gonzales H, Saldin KR, Grotta JC, Shaw SJ, Knudson L, Frankowski RF (2001) Headache in the emergency department. *Headache* 41:537–541
9. Blumenthal HJ, Weisz MA, Kelly KM, Mayer RL, Blonsky J (2003) Treatment of primary headache in the emergency department. *Headache* 43:1026–1031
10. Headache Classification Committee of the International Headache Society (1988) Diagnostic criteria for headache disorders, cranial neuralgias and facial pain. *Cephalalgia* 8[Suppl 7]:20
11. Fiesseler FW, Kec R, Mandell M, Eskin B, Anannab M, Riggs RL, Richman PB (2002) Do ED patients with migraine headaches meet internationally accepted criteria? *Am J Emerg Med* 20:618–623
12. Headache Classification Subcommittee of the International Headache Society (2004) The International Classification of Headache disorders, 2nd edn. *Cephalalgia* 24[Suppl 1].
13. Ducharme J (1999) Canadian association of emergency physician guidelines for the acute management of migraine headache. *J Emerg Med* 17(1):137–144
14. Friedman BW, Corbo J, Lipton RB, Bijur PE, Esses D, Solorzano C, Gallagher EJ (2005) A trial of metoclopramide vs sumatriptan for the emergency department treatment of migraines. *Neurology* 64:463–468
15. Silberstein SD, Winner PK, Chmiel JJ (2003) Migraine preventive medication reduces resource utilization. *Headache* 43(3):171–178