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## Clinical and descriptive analysis of chronic daily headaches

**Abstract** With an ad hoc, previously validated clinical record, we analysed the headache characteristics in 245 patients (F, 78.4%, M, 21.6%; mean age, 43.1±12.9 years) affected by chronic daily headache (CDH) attending 9 Italian headache centers. Migraine without aura was the episodic headache preceding CDH in 72.3% of the cases. We divided CDH into 3 categories: chronic tension-type headache (CTTH), chronic coexisting migraine and tension-type headache (CCMTTH), and chronic migraine (CM). CCMTTH accounted for 46.5% of the cases, followed by CM (30.2%) and CTTH (23.3%). Female prevalence was more marked in CCMTTH and CM groups, in

which episodic headache started earlier. Migraine without aura was the episodic headache preceding CDH not only in most cases of CCMTTH (83.0%) and CM (91.9%), but also in 25% of CTTH patients.

Analgesics misuse (abuse of weak analgesics and/or combination drugs in almost all the cases) prevailed among CCMTTH (61%) and CM (89%) patients with respect to CTTH patients (37%).

**Key words** Chronic daily headache · Chronic tension-type headache · Chronic coexisting migraine and tension-type headache · Chronic migraine

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### Introduction

This article, preceding those which analyze the psychiatric co-morbidity of chronic daily headache (CDH), describes the case series on which the research was based and summarizes the clinical record used for data collection.

### The survey tool: CDH clinical record

To collect the data in the study concerning CDH, we used an ad hoc clinical record, widely utilized in other surveys and previously validated [1], including the following sections:

- Demographic data (gender, age, marital status, education, occupation);
- Physiological history (especially habits);
- History of female reproductive life (age at menarche, menstrual cycle, pre-menstrual syndrome, oral contraceptive intake, menopause);
- Headache family history;
- Pathological history;
- Headache history (age at onset of episodic headache preceding CDH, age at onset of CDH, diagnosis of episodic headache preceding CDH and of other types of headache, analgesics misuse);
- Factors possibly favoring the transformation of episodic headache into CDH (stressful situations, drugs misuse, oral contraceptive intake, intake of drugs able to provoke

or worsen headache, high blood pressure, life events, head trauma, cranial and facial inflammatory conditions, menopause, surgical operations);

- Headache course, both of episodic headache preceding CDH and of CDH, during the main events of female reproductive life (menarche, pregnancy, post-partum, oral contraceptive intake, menopause);
- Clinical features of episodic headache preceding CDH, of daily headache and of attacks, if present. This section includes items concerning temporal pattern, favoring circumstances (menses, week-end, stress, food), headache duration, pain characteristics, and associated phenomena;
- A specific form for the evaluation of analgesics use (by Modena Headache Center).

### Inclusion criteria

The study enrolled patients:

- With headache for at least 15 days per month during at least 6 months;
- Of both genders, 18–65 years of age;
- Whose history and/or physical and neurological examinations did not suggest an organic cause of headache. A possible organic disease was ruled out by means of neuroimaging or other appropriate examinations, if needed. Patients affected by chronic cluster headache, chronic paroxysmal hemicrania, hemicrania continua, or chronic post-traumatic headache were excluded. Patients not able (for mental impairment, psychosis or other reasons) to actively collaborate were also excluded.

Statistical analysis was performed by means of chi-square test and Student's *t* test, when appropriate.

### Population characteristics

This multicenter study was carried out in nine Italian headache centers (Bari, Florence, Milan, Padua, Parma, Pavia, Perugia, Rome, Trieste). A total of 245 patients were enrolled, including 53 men (21.6%) and 192 women (78.4%). Mean age was  $43.1 \pm 12.9$  years (range, 18–65 years).

Age at onset of episodic headache preceding CDH was  $20.4 \pm 10.4$  years (range, 3–62 years); age at onset of CDH was  $36.2 \pm 12.6$  years (range, 8–64 years). Mean duration of episodic headache was  $16.0 \pm 12.2$  years (range, 0–50 years), whereas mean duration of CDH was  $7.0 \pm 7.6$  years (range, 1–37 years).

**Table 1** Type of episodic headache preceding CDH (n = 242)

Diagnosis	Patients, n (%)
Migraine without aura	175 (72.3)
Migraine with aura	7 (2.9)
Episodic tension-type headache	33 (13.6)
CDH from the beginning	24 (9.9)
Headache not classifiable	3 (1.2)

CDH, chronic daily headache

Factors possibly favoring the transformation of episodic headache into CDH were individuated in 89 patients (36.3%). Analgesics misuse was present in 157 patients (64.1%).

### Headache characteristics

Migraine without aura was the episodic headache preceding CDH in most cases (72.3%), while episodic tension-type headache accounted for 13.6% of the cases only. Finally, in about 10% of the patients, CDH was chronic from the beginning (Table 1).

As regards CDH classification, we considered three types of daily headache: chronic tension-type headache (CTTH), chronic coexisting migraine and tension-type headache (CCMTTH), and chronic migraine (CM). Only CTTH is included in the International Headache Society classification [2]. In our sample the most frequent CDH was CCMTTH (114 cases; 46.5%), followed by CM (74 cases; 30.2%) and CTTH (57 cases; 23.3%).

### Analysis by CDH type

Population characteristics according to CDH type are illustrated in Table 2. As far as gender is concerned, female prevalence was far more marked among CCMTTH and CM cases, even though women prevailed in all the forms of CDH. In patients suffering from "migrainous" CDH (CCMTTH and CM), episodic headache started earlier. As regards age of onset, on average CDH began during the fourth decade in all forms, even though CCMTTH tended to begin earlier. Finally, the time span from the beginning of episodic headache to CDH onset was shorter in CTTH patients compared to CCMTTH and CM patients.

The type of episodic headache preceding CDH in the various CDH forms is shown in Table 3. Not surprisingly, migraine (almost always without aura) was the headache at

**Table 2** Characteristics of the 245 patients, according to CDH type

	CTTH (n = 157)	CCMTTH (n = 114)	CM (n = 74)	p
Women (%)	63.2	82.5	83.8	0.006
Female:male ratio	1.7:1	4.7:1	5.2:1	
Mean age (SD), years	44.3 (14.9)	40.8 (12.5)	45.5 (11.4)	0.04
Mean age (SD) at onset of episodic headache, years	28.1 (12.8)	17.6 (8.5)	18.7 (8.0)	0.0001
Mean age (SD) at onset of CDH, years	39.0 (13.6)	33.7 (12.5)	38.0 (11.2)	0.01
Mean duration (SD) of episodic headache, years	11.1 (13.5)	16.2 (11.4)	19.3 (11.3)	0.01
Mean duration (SD) of CDH, years	5.3 (5.9)	7.2 (7.4)	8.0 (8.9)	n.s.

CTTH, chronic tension-type headache; CCMTTH, chronic coexisting migraine and tension-type headache; CM, chronic migraine; CDH, chronic daily headache; n.s., not significant

**Table 3** Type of episodic headache preceding CDH, according to the various forms of CDH

Preceding headache type	CDH patients, %		
	CTTH	CCMTTH	CM
Migraine without aura	25.0	83.0	91.9
Migraine with aura	0.0	4.5	2.7
Episodic tension-type headache	44.6	6.3	1.4
CDH from the beginning	30.4	4.5	2.7
Headache not classifiable	0.0	1.8	1.4

CTTH, episodic tension-type headache; CCMTTH, chronic coexisting migraine and tension-type headache; CM, chronic migraine; CDH, chronic daily headache

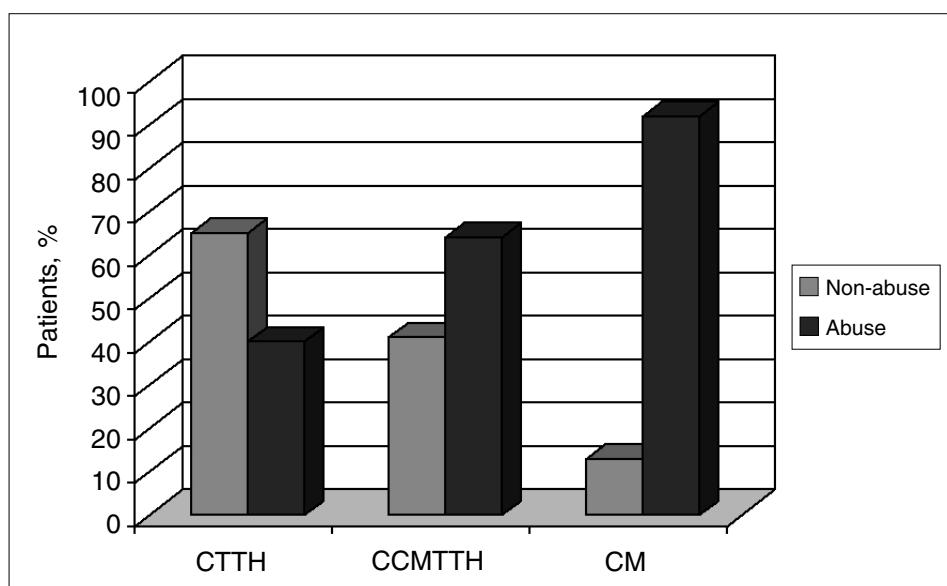
onset in the overwhelming majority of the cases of “migrainous” CDH (87.5% of CCMTTH cases; 94.6% of CM cases). Only in a very small number of CCMTTH and CM cases, the headache was either chronic from the beginning or represented by an episodic tension-type headache. It is worth noting that in a quarter of the cases, CTTH derived not from an episodic tension-type headache, but from

migraine. In the last case, we probably deal with patients in whom migraine, over the years, lost its “migrainous” features to change into tension-type headache (“transformed migraine” according to Manzoni et al. [3]).

The percentage of patients who used an excessive amount of analgesics (defined as a daily usage, independently from the dose) according to the CDH type is shown

**Fig. 1** Distribution of analgesics abuse by CDH type.

CTTH, chronic tension-type headache; CCMTTH, Chronic coexisting migraine and tension-type headache; CM, chronic migraine; CDH, chronic daily headache



**Table 4** Population characteristics according to the presence of analgesics abuse

	Abuse (n = 57)	Non-abuse (n = 88)	p
Women, %	82.8	70.5	0.02
Female:male ratio	4.8:1	2.4:1	
Mean age (SD) years	45.7 (11.3)	38.4 (14.4)	0.0001
Mean age (SD) at the onset of episodic headache, years	18.7 (9.3)	23.3 (11.7)	0.001
Mean age (SD) at the onset of CDH, years	37.9 (11.5)	33.2 (13.8)	0.005
Mean duration (SD) of episodic headache, years	19.2 (11.4)	10.1 (11.4)	0.0001
Mean duration (SD) of CDH, years	8.0 (8.0)	5.2 (6.5)	0.006

CDH, chronic daily headache

in Fig. 1. Analgesics misuse was present in 37% of the CTTH cases, in 61% of the CCMTTH cases and in 89% of the CM patients. Therefore, it is reasonable to assume that CCMTTH and CM only infrequently are autonomous diseases, being in most cases generated or, at least, aggravated by analgesics misuse. Obviously, since we lack the mandatory criterion of headache improvement after analgesics withdrawal [3], we cannot however diagnose a headache induced by analgesics abuse. On the other hand, we can hypothesize that, in some cases at least, the analgesics abuse is the “natural” consequence of an exasperating sequence of almost daily migraine attacks; that is the quintessence of CM.

#### Analysis by analgesics abuse

We have the detailed characteristics of analgesics abuse in 155 out of 157 patients who used an excessive amount of pain-killers. In almost all the cases (n = 153; 98.6%), there was a misuse of weak analgesics and/or combination drugs. In only two cases, the drug abuse concerned either ergotamine or ergotamine plus weak analgesics, respectively. The mean duration of drug abuse was 44.9±44.4 months (range, 3–300 months). The mean number of doses per month was 64.4±48.4 (range, 30–300). Quite surprisingly, only two patients (2.8%) took an excessive amount of ergotamine, whose ability to induce a chronic headache is well-known [4]. This is likely due to the fact that ergotamine use dropped in the last years, in favor of more modern and tolerable drugs like triptans. Moreover, none of our patients abused sumatriptan. In our opinion this is a further demonstration that the ability of triptans to induce a rebound headache is minimal indeed.

The population characteristics according to the presence of drug abuse are illustrated in Table 4. Among the abusers, females prevailed (82.8% vs. 70.5% among non-abusers). On the contrary, little more than 50% of males were abusers. This uneven distribution of abusers between genders is probably due to the different prevalences of the various CDH

types in the two sexes. In fact about 40% of the males, vs. 19% of the females, suffered from CTTH, the CDH type with less propensity to generate abuse. The abusers were older than non-abusers and presented a longer CDH duration. The mean duration of episodic headache preceding CDH was higher in these individuals (19.2 vs. 10.1 years), while the onset of episodic headache occurred at an earlier age compared to non-abusers (18.7 vs. 23.3 years). We conclude from our data that, in addition to personality profile and psychopathologic characteristics, even biological factors inherent to headache itself may favor the occurrence of drug abuse behavior.

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**References**

1. Manzoni GC, Granella F, Sandrini G, Antonaci F, Zanferrari C, Nappi G (1993) A computerized record chart for the study of chronic daily headache. *Funct Neurol* 8:293–300
2. Headache Classification Committee of the International Headache Society (1988) Classification and diagnostic criteria for headache disorders, cranial neuralgias and facial pain. *Cephalgia* 8[Suppl 7]:1–96
3. Manzoni GC, Micieli G, Granella F, Cavallini A, Alfieri M, Nappi G (1988) Cefalee croniche quotidiane: profili clinici e farmacologici. In: Sternieri E, Nappi G (eds) *Cefalee da farmaci*. Cluster Press, Rome, pp 77–88
4. Andersson PG (1975) Ergotamine headache. *Headache* 15:118–121