Patients with chronic headache tend to have more psychological symptoms than those with sporadic episodes of pain

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ABSTRACT
There are controversial associations between headaches and psychological symptoms. **Objective:** To design a profile of neuroticism, a term that groups variables related to negative personality traits, in patients with chronic daily headache (CDH) when compared to episodic migraine (EM) patients, applying the Factorial Scale of Emotional Adjustment/Neuroticism (NFS). **Method:** One hundred adult patients with CDH and forty with EM answered the NFS. **Results:** Comorbidities of subtypes of neuroticism (p=0.006) were more common in chronic daily headache patients, with three or more disorders (p=0.0002): dependent personality disorder (p=0.0001), anxiety, reduced concentration and production (p=0.0008), depression (p=0.0001), suicidal ideation (p=0.0008) and hopelessness even without depression (p=0.0001). **Conclusion:** Patients with CDH tend to have dependent personality disorder, low production and concentration, anxiety, depression, suicidal ideation and hopelessness, superimposing two or more psychological disorders. These factors should be pondered for a better resolution in the treatment of CDH.

Keywords: headaches disorders, migraine, psychology.

RESUMO
Há associações controversas entre cefaleia e sintomas psicológicos. **Objetivo:** Traçar um perfil de neuroticismo em portadores de cefaleia crônica diária (CCD) quando comparados aos portadores de migraña episódica (ME), utilizando-se a Escala Fatorial de Ajustamento Emocional/Neuroticismo (EFN). **Método:** Cem pacientes adultos com CCD e quarenta com ME, responderam à EFN. **Resultados:** Comorbidades de subtipos de neuroticismo (p=0.006) destacaram-se na CCD, ultrapassando três transtornos (p=0.0002): transtorno de personalidade dependente (p=0.0001), ansiedade, concentração e produção diminuídas (p=0.0008), depressão (p=0.0001), ideação suicida (p=0.0008) e desesperança (p=0.0001), mesmo sem depressão (p=0.0001). **Conclusão:** Paciente com CCD apresentaram indícios de transtorno de personalidade dependente, baixa capacidade de concentração e produção, ansiedade, depressão, ideação suicida e desesperança, superpondo dois ou mais transtornos psicológicos. Esses fatores devem ser ponderados para maior resolutividade no tratamento da CCD.

Palavras-chave: transtornos da cefaleia, migranea, psicologia.

The term chronic daily headache (CDH) covers a group of primary headaches that occur more than fifteen days per month, with duration of a minimum of four hours, over at least three months. CDH include chronic migraine (CM), chronic tension-type headache (CTTH), hemicranias continua (HC), and new daily persistent headache (NDPH). CDHs affect from 3 to 5% of the general population, and account for approximately 40% of resources of clinics specialized in headaches. Chronic migraine is the most prevalent subtype of CDH seen in tertiary care centers. The first description of a migrainous personality was published by Harold Wolf in 1937 who reported an association between migraine and some psychiatric symptoms. Although this characterization of migrainous adults as obsessive, shy, obedient and with rigid and inflexible traits has since been abandoned, the concept at that time highlighted a need to investigate correlations between headaches and psychological factors. Clinical and
epidemiological studies have shown that psychiatric disorders occur more frequently in patients who suffer from recurring headaches29.

A review of the literature on headache and personality provides strong evidence of secondary neuroticism and increased sensitivity to stress in patients suffering from CDH10,11,12 and episodic migraines (EM)13,14,15. Higher scores for neuroticism, a term that groups variables related to negative personality traits, have been noted for chronic migraine patients7,14,16 than for other patients or for a healthy population. Mood and anxiety disorders are the most prevalent in this population. Many studies used the Minnesota Multiphasic Personality Inventory (MMPI) to investigate patients with different types of headaches or other pains. The highest scores were given to patients with the strongest or most frequent types of pain and to patients with long-lasting headaches. This perhaps justifies why “such psychological abnormalities, often seen in chronic headaches, are frequently interpreted as responses to chronic pain”14.

In the case of migraine, Bigal and Lipton described it as a chronic disease with progressive and sporadic manifestations in some people17,18; the very process of becoming chronic remains unclear. It is believed that progression of migraine leads to changes in the central nervous system that are manifested by changes in nociceptive and pain thresholds, such as central sensitization19. The fact that individuals with chronic headache, including migraine, regularly suffer from other comorbidities, indicates the need for studies on the possibility that the same pathophysiological mechanisms explain the two clinical manifestations20. The relationship between premorbid disorders may be causal or casual, or even share the same risk factors (genetic or environmental) producing a mental state which gives rise to the two conditions8.

The characterization of the personality and psychological functioning of patients with headaches has been an area of interest not only in the psychosomatic medical literature, but also in psychiatry and neurology21,22,23. The aim of this study was to assess possible associations between CDH and neuroticism by comparing individuals suffering from CDH to those with EM and to describe a possible personality profile typical of CDH patients from the viewpoint of neurotic symptoms, using the Factorial Scale of Emotional Adjustment/Neuroticism (NFS).

METHOD

A prospective study was carried out of 140 outpatients in an Headache Outpatient Clinic. Participants, of both genders with a minimum age of 18 years, were allocated to two groups: individuals with syndromic diagnosis of CDH and those with EM. After a consultation with a neurologist and formally consenting to participate in this study, the patients were interviewed by a psychologist who noted demographic variables and applied the NFS. The exclusion criteria were the diagnosis of other neurological comorbidities or other chronic organic diseases. Data were analyzed using the Fisher exact test. Differences between groups with p-values<0.05 were considered significant. All the subjects provided written consent for their participation in the study, which was approved by the Ethics Committee.

The NFS22 is an objective scale for evaluating a dimension in human personality called neuroticism based on the Five-Factors Model (FFM), developed from studies by Allport and Odbert. This scale consists of 82 items and four sub-factors: vulnerability, psychosocial maladjustment, anxiety and depression. The results may indicate evidence of dependent, avoidant, antisocial or “borderline” personality disorders, depression, anxiety, difficulties in perceiving and addressing problems, low concentration and production, suicidal thoughts and despair. Although this inventory is not efficacious for diagnosis, it was drawn up using DSM-IV criteria and indicates trends that should be better investigated in each case.

This study compared two groups of patients: those with chronic headache and those with sporadic episodes of pain.

RESULTS

The mean age of the patients was 42 years with a standard deviation of 14.42 and range of 18 to 81 years. Only 14.2% of the 100 patients with CDH and 40 with EM were male (Table 1). Although there was not a prior concern regarding the matching of the groups which were formed by order of arrival, there was no significant difference in the proportions of men and women between groups.

However, the EM Group was significantly younger than the CDH Group (p=0.0049). Figure 1 shows the distribution of patients by age group.

All the patients were evaluated by a neurologist before being invited to take part in this study. In the CDH Group, with one or more subtypes of the syndrome, the mean duration of the headaches was 10.75 years (standard deviation – SD=13.90; range: 6 months to “over 65 years”). The mean duration of the headaches in the EM Group was 9.31 years (SD=12.19; range: 2 months to “over 40 years”).

The mean age at the onset of headaches for the CDH Group was 34.38 years (SD=14.71; range: 7-66 years). For the EM Group the mean age at the onset of pain was 27.83 years (SD=14.45; range: 7-56 years).

The most frequent subtype of daily chronic headache was migraine. Figure 2 shows the proportion of the different subtypes of CDH found in this study.
Use of analgesics is frequent in patients with headaches and this can possibly change the course of disease. Figure 3 shows the percentage of patients who took excessive medications, according to the criteria of the International Headache Society. It was noted that both the CDH and EM Groups had high prevalence of symptoms of neuroticism (Table 2). However, patients with CDH appeared to be more susceptible to neurotic symptoms: 90% of the patients of this group had at least one symptom of neuroticism against 67.5% in the EM Group (p=0.006). This difference between groups is more notable as the number of comorbid disorders increases, that is, for two or more associated disorders (p=0.0002). Table 2 shows the manifestations of neuroticism in both the CDH and EM Groups.

In fact, differences in relation to almost all the subtypes of neuroticism were clear in the statistical comparison between groups. The CDH Group had the highest proportion of patients with dependent personality (p=0.0001), anxiety with less concentration and productivity (p=0.0008) and depressive disorders (p=0.0001). Moreover, two symptoms that are often present in depression were analyzed in particular; patients with CDH had more suicidal thoughts (p=0.0008) and despair (p=0.0001).

### Table 1. Sociodemographic characteristics of patients with chronic daily headaches (n=100) and episodic migraines (n=40).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Chronic daily headaches (n=100)</th>
<th>Episodic migraines (n=40)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>10 (10.0)</td>
<td>9 (22.5)</td>
<td>0.066</td>
</tr>
<tr>
<td>Female</td>
<td>90 (90.0)</td>
<td>31 (77.5)</td>
<td>0.066</td>
</tr>
<tr>
<td>Age (years)</td>
<td>44±14.1</td>
<td>37±12.7</td>
<td>0.0049</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>21 (21.0)</td>
<td>10 (25.0)</td>
<td>0.600</td>
</tr>
<tr>
<td>Married</td>
<td>67 (67.0)</td>
<td>24 (60.0)</td>
<td>0.439</td>
</tr>
<tr>
<td>Separated/divorced</td>
<td>5 (5.0)</td>
<td>4 (10.0)</td>
<td>0.307</td>
</tr>
<tr>
<td>Widowed</td>
<td>7 (7.0)</td>
<td>2 (5.0)</td>
<td>0.712</td>
</tr>
<tr>
<td>Employment status</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>62 (62.0)</td>
<td>15 (37.5)</td>
<td>0.011</td>
</tr>
<tr>
<td>Employed</td>
<td>38 (38.0)</td>
<td>25 (62.5)</td>
<td>0.011</td>
</tr>
<tr>
<td>Schooling</td>
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</tr>
<tr>
<td>Less than 1 year</td>
<td>6 (6.0)</td>
<td>1 (2.5)</td>
<td>0.444</td>
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<td>2-7 years</td>
<td>48 (48.0)</td>
<td>9 (22.5)</td>
<td>0.005</td>
</tr>
<tr>
<td>8-10 years</td>
<td>14 (14.0)</td>
<td>5 (12.5)</td>
<td>0.842</td>
</tr>
<tr>
<td>11 or more years</td>
<td>32 (32.0)</td>
<td>25 (62.5)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

CDH: chronic daily headache; EM: episodic migraines.

**Figure 1.** Distribution of patients by age groups according to each study group at the time of this study.

**Figure 2.** Proportion of the different subtypes of CDH

**Figure 3.** CDH with or without medication overuse.
On the other hand, patients in the EM Group had more avoidant personality disorder (p=0.0005), a tendency to be less alert and without motivation (p=0.0001) and difficulty to perceive their problems (0.0001) than the CDH Group.

There was no significant difference in respect to the symptom of suicidal ideation among depressed patients of the two groups (p=0.3391); hopelessness, in contrast, was more common among those with CDH (p=0.0597). Among patients without depression, although there was no significant difference between the two groups regarding suicidal thoughts (p=0.7252), patients with CDH presented more hopelessness (p<0.0001).

Despite the small number of men in the sample, differences in neuroticism between men and women of the same group were investigated. It was found that both men and women in the EM Group have symptoms of neuroticism (p=0.321). The same was observed with respect to the subtypes of personality disorders: both men and women with EM present subtypes of personality disorders and there seems to be no significant differences between genders in this group.

In the CDH group, no difference was found comparing genders in relation to patients presenting neuroticism symptoms in general (p=0.5153). However, on analyzing subtypes of disorders separately, it was noted that, in this group, women had more depression (p=0.0199) and suicidal ideation (p=0.0479) than men.

**DISCUSSION**

The fact that patients in the EM Group were younger than those in the CDH Group seems to corroborate the hypothesis that EMs tend to become more frequent with time.

Evidence of three or more subtypes of neuroticism was identified in 34% of patients with CDH and 5% with EM (p=0.0002). Patients with CDH proved to be susceptible to more subtypes of neuroticism and to a higher number of symptoms, often with indicia (signs, evidence) of two or more concomitant neuroticism subtypes (p=0.0002). This corroborates previous publications that assumed that psychiatric disorders occur more frequently in patients who suffer from recurring headaches. In 1982, Andrasik stated in his studies that the severity of psychiatric symptoms might be positively associated with the frequency of headaches. An item-by-item analysis of the symptoms assessed with the present inventory showed that patients with CDH have strong indicia of dependent personality disorder characterized by the need for approval and the expectation of help from others. In contrast to this, patients with EM tend to be excessively detached and independent in respect to their opinions and their acceptance of help from others, eventually evolving with avoidant personality disorder. A follow-up study may be useful to assess whether there is a change in the characteristics of personality dependency along with an increasing frequency of headaches as the patient ages (p=0.0049).

EM patients exhibited a perceptual detachment from their problems, less motivation and attention in relation to new and unexpected situations, characterized by an excessively low level of anxiety (p=0.0001). However, on analyzing subtypes of disorders separately, it was noted that, in this group, women had more impulsive, irritability, panic and mood swings that lead to less concentration and a drop in productivity, characterized by an excessively high level of anxiety (p=0.0008).

The association of CDH with anxiety and depression is well established, as was also found in this study. Furthermore, suicidal ideation and hopelessness were significant differences in both groups. Although 2.5% of the EM sample presented suicide ideation, this rate was 10 times higher (25%) in CDH (p=0.0008), particularly in the women of this group (p=0.047). Hopelessness was also more present...
in subjects with CDH (p<0.0001), even in patients without depression (p<0.0001).

With EMs, the patients tend to become detached from themselves and others, decreasing their self-criticism and perception that they have problems, with less motivation and assertiveness to solve their problems (p=0.0001), they become less aware, with a distancing of their opinions and expectations of others, eventually evolving to an extreme of avoidant personality disorder (p=0.0005). It seems to be connected to their pain, nothing and nobody else matters, a strategic attempt to confront or adapt to the stress associated with the painful condition.

CDH patients, on the other hand, have the opposite stance, an anxious search (p=0.0008) with dependence on others (p<0.0001), a disorganized state and irritable mood with less control, a depressive anxious apathy (p<0.0001), loss of hope (p<0.0001) and suicidal ideation (p=0.0008). As if the effort to manage the stress of pain had waned and they had succumbed.

This study appears to point to an increase in the threshold of bearable pain. On comparing with EM, CDH patients seems to becomes exhausted, evolving with a greater number of psychopathologies, depression, anxiety, despair and suicidal ideation. Perhaps as the migraine becomes chronic it is associated with this reduction in sensitivity that annuls the patient’s ability to cope. In this study, as in others, half of the patients with CDHs presented stress and were almost at the point of exhaustion. So, it is possible to understand the despair (p<0.0001), suicidal ideation and the larger number of combined disorders as a collapse of the organism in successive attempts to adapt to continuous pain, typical of a stress exhaustion stage.

In conclusion, patients with CDH tend to have dependent personality disorder, low production and concentration, anxiety, depression, suicidal ideation and hopelessness, superimposing two or more psychological disorders. These factors should be considered for a better resolution in the treatment of CDH.

References