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Emotional Status, Perceived Control of Pain, and Pain Coping Strategies in Episodic and Chronic Cluster Headache

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Abstract

Cluster headache (CH) is a chronic syndrome characterized by excruciatingly painful attacks occurring with circadian and circannual periodicity. The objectives of the present study were, in CH patients, to determine by principal component analysis the factor structure of two instruments commonly used in clinics to evaluate pain locus of control (Cancer Locus of Control Scale–CLCS) and coping strategies (Coping Strategies Questionnaire–CSQ), to examine the relationship between internal pain controllability and emotional distress, and to compare psychosocial distress and coping strategies between two subsets of patients with episodic or chronic CH. Results indicate, for CLCS, a 3-factor structure (internal controllability, medical controllability, religious controllability) noticeably different in CH patients from the structure reported in patients with other painful pathologies and, for CSQ, a 5-factor structure of CSQ which did not markedly diverge from the classical structure. Perceived internal controllability of pain was strongly correlated with study measures of depression (HAD depression/anhedonia subscale, Beck Depression Inventory). Comparison between subsets of patients with episodic or chronic CH of emotional status, pain locus of control, perceived social support and coping strategies did not reveal significant differences apart for the Reinterpreting pain sensations strategy which was more often used by episodic CH patients. Observed tendencies for increased anxiety and perceived social support in patients with episodic CH, and for increased depression and more frequent use of the Ignoring pain sensations strategy in patients with chronic CH, warrant confirmation in larger groups of patients.

Keywords: cluster headache, anxiety, depression, pain locus of control, coping strategies

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Cluster headache (CH) is a member of the trigeminal autonomic cephalalgias which form a group of primary disorders characterized by unilateral trigeminal distribution pain occurring in association with prominent ipsilateral cranial autonomic features. It is an excruciating syndrome, and probably constitutes the most painful condition known to humans (Matharu & Goadsby, 2002). The prevalence of CH is estimated to be about 0.01-0.03% (Katsarava et al., 2007; Manzoni & Stovner, 2010), and more men than women are affected (Manzoni, 1998; Donnet et al., 2007; Fischera, Marziniak, Gralow, & Evers, 2008).

CH is characterized by a striking circannual and circadian periodicity. Its etiology is unknown but physiopathology may involve the trigeminal nociceptive pathways, the autonomic system and the posterior hypothalamic gray matter (Lanteri-Minet, 2003). Attacks occur in series (cluster periods)–from once every other day up to eight times a day–lasting for weeks or months, separated by remission periods usually lasting months or years. In episodic CH, cluster periods of one week to one year are separated by pain-free periods of one month or longer, while in chronic CH the attacks may occur for more than one year without remission or remissions lasting less than one month (Headache Classification Subcommittee of the International Headache Society, 2004).

Chronic pain has physical, psychological and social impacts on patients, affecting confidence to cope with pain, accomplish life goals, live a normal lifestyle, and maintain normal social and leisure activities. In order to cope with and adjust to the burden of pain, chronic pain patients develop a range of cognitive, emotional and behavioral strategies, according to pre-existing personality characteristics, some of which (e.g., passive coping and dramatizing/catastrophizing) eventually play a pejorative role in pain-related disability and depression (Brown & Nicassio, 1987; Snow-Turek, Norris, & Tan 1996; Arnstein, Caudill, Mandle, Norris, & Beasley, 1999; Asghari & Nicholas, 2001; Asghari & Nicholas, 2006; Koleck, Mazaux, Rascle, & Bruchon-Schweitzer, 2006; Mongini et al., 2009).

As CH has some specificities among chronic painful pathologies, one of the objectives of the present study was to determine in CH patients, by principal component analysis, the factor structure of two instruments widely used in research and clinics to evaluate perceived control of the disease and pain coping strategies (Cancer Locus of Control Scale–CLCS–and Coping Strategies Questionnaire–CSQ–, respectively) (Rosenstiel & Keefe, 1983; Pruyn et al., 1988) and to compare results with the factor structures reported for the same instruments in other categories of chronic pain patients. To the best of our knowledge, CLCS had not been used in CH patients as yet. Since pain patients' attitude towards pain sensations, beside pain intensity, is known to influence psychological outcomes (Arnstein et al., 1999; Asghari & Nicholas, 2001), the relationship between perceived pain control and emotional distress was also examined. Finally, hypothesizing that duration and periodicity of pain episodes may affect pain levels and functional outcomes in CH patients, another objective of the study was to compare psychosocial distress and pain coping strategies between subsets of patients with episodic or chronic CH.

Methods

Study Setting – Participants

This was a cross-sectional, observational study carried out from November 2004 to July 2005 among patients consulting at the Emergency headache center (‘Centre d'Urgences Céphalées’–CUC) of Lariboisiere hospital in Paris. Patients who accepted to participate were administered a series of questionnaires exploring emotional status, perceived pain control and social support, pain-related disability and coping. As the survey did not cause any change in disease management, no approval from institutional ethics committee was required. Nevertheless, patients signed informed consent to participate prior to any study procedure was performed.

The patients seen at the CUC are those who need urgent medical care, i.e., patients who present with an abrupt recent-onset headache or with an acute recurrent attack of headache not relieved by the usual treatments. Approximately two thirds of these patients suffer from primary headaches and about 5% from CH (Valade, 2005). All patients included in the survey had episodic or chronic CH diagnosed according to the International Headache Society criteria (Headache Classification Subcommittee of the International Headache Society, 2004) and had experienced a cluster period within the past three weeks. Possible past or concomitant organic or mental diseases were not taken into account for patient recruitment. Demographic attributes and history of the disease were recorded at patient inclusion.

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Measuring Instruments

Emotional status was measured with the French version (Lépine, Godchau, Brun, & Lemperière, 1985) of the Hospital Anxiety and Depression (HAD) scale (Zigmond & Snaith, 1983). This is a 14-point scale which contains seven questions on anxiety symptoms and seven on depressive symptoms. The depression scale was constructed so that it does not contain items relating to symptoms that may be caused by the physical illness and emphasizes anhedonia (inability to feel pleased). The HAD scale has been in widespread use and is currently recommended by the French national medico-economic evaluation service for use in chronic pain patients (Agence Nationale d'Accréditation et d'Evaluation en Santé (ANAES), 1999). Each item is scored from 0 to 3 on the basis of average mood over the last ten days. Scores of 8 or over at the anxiety or depression scale were taken as indicative of anxiety or depression, respectively.

Depression was assessed with the French version (Collet & Cottraux, 1986) of the short-form (13-item) of the Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). This validated abbreviated questionnaire contains only the items that are most strongly correlated with total score at the original questionnaire and with clinical evaluation of depression severity. It retains the original cognition triad described by Beck: negative thoughts about oneself, about the external world, and about the future (Beck, Steer, & Carbin, 1988). Each item is scored from 0 to 3 on the basis of patient's current mood state. For the study, scores of 4-7 were considered indicative of mild depression, scores of 8-15 of moderate depression, and scores of 16 or greater of severe depression.

Perceived control was assessed with a French version of the CLCS (Pruyn et al., 1988; Watson, Pruyn, Greer, & Van Den Borne, 1990) which had previously been used in research in France (Cousson-Gélie, 1997; Koleck, 2000) in patients suffering from a chronic disease or chronic pain, except that “pain” was taken as “the disease”. The French version has been validated (Bruchon-Schweitzer, 2001). This 17-item questionnaire assesses three different types of cognitions: internal or external estimated locus of control of disease progression; internal or external causative attributions of the origin of the disease; ascription of the disease to God and internal/external control through patient's religion. Each item is scored from 0 to 3 according to intensity of patient agreement/disagreement with each statement. A summed score is obtained for each psychological dimension explored by the questionnaire.

Perceived social support was assessed with the validated French version (Rascle et al., 1997) of the 6-item abbreviated Social Support Questionnaire (SSQ-6). This questionnaire measures the number of people to whom the patients could turn and on whom they could rely in given sets of circumstances (availability: scores 0-9 persons) and the corresponding satisfaction retrieved from the support given (satisfaction: scores 1-6). Different areas of support (emotional, self-esteem, information, practical) are explored. Total scores of availability (0-54) and satisfaction (6-36) are obtained by summing individual scores at the corresponding items.

Coping with pain was assessed by the French version (Koleck, 2000; Irachabal, 2002) of the CSQ (Rosenstiel & Keefe, 1983). This questionnaire is the most widely used measure of behavioral and emotional adjustment to chronic pain. The original version is comprised of 48 individual items. The French version is comprised of only 21 items and does not contain coping self-statements and behavioral coping. For each item of the questionnaire, patients are invited to score (from 0 to 4) the frequency of use of the proposed strategy. The sum of scores is calculated for each coping strategy.

Pain-related disability was assessed by the 6-item Headache Impact Test (HIT-6) (Bayliss et al., 2003) which is an abbreviated and validated form of the original 54-item questionnaire (Bjorner et al., 2003). HIT was developed by applying the Item Response Theory and other psychometric techniques to widely used questionnaires of headache impact (Ware, Bjorner, & Kosinski, 2000). Headache severity and frequency of headache-related disabling symptoms (limitation in activities, tiredness, being fed up or irritated, difficulty in concentrating) in the past four weeks are scored from 0 to 4. For analysis of study data, a total score >55 (score above which an immediate medical appointment is recommended) was considered to indicate a significant disrupting effect of pain on patient's life. A French version (QualityMetric, Inc. and GlaxoSmithKline Group of Companies, 2000) has been used in France to measure the impact of migraine on patient physical, social and emotional functioning (Vuillaume De Diego & Lanteri-Minet, 2005).

Statistical Analysis

Factor structure of the CLCS was determined in the whole sample of study CH patients by principal component extraction followed by normalized orthogonal varimax rotation to identify clusters of variables (sets of inter-correlated items). Which items were strongly associated with the considered factors was determined by the factor loading: items with a factor loading less than .40 were deleted for analysis. Internal consistency of each identified factor was measured by Cronbach's α coefficient. Factor analysis of the CSQ was determined similarly, except that it was based on an *a priori* 5-factor (strategy) structure.

Secondarily, two subsets of patients with episodic or chronic CH were compared for a series of variables (anxiety and depression, perceived controllability of the disease, perceived social support, coping with pain) after controlling for a number of factors (age, age at disease onset, age at diagnostic, time before diagnostic, disease duration, perceived level of headache-related disability).

Relationships between perceived controllability (total score at all items grouped together in the corresponding CLCS factor) and depression (scores at the HAD depression/anhedonia subscale, the HAD global scale, and the BDI) were determined by correlation analyses. Inter-relationships between all depression and anxiety scores were also determined in pairs by computing the relevant correlation coefficients.

Continuous variables were summarized by the mean and standard deviation (SD). Homogeneity of variances was assessed by F tests. Data normality was assessed by the Kolmogorov-Smirnov test. Comparison of independent data was performed by Student's t tests. Linear correlations were assessed by the Bravais-Pearson correlation coefficient. Probability values less than or equal to 0.01 were considered to be statistically significant. All statistical analyses were performed with the Statview software version 5.

Results

Patient Characteristics and Main Disease Features

A total of 73 CH patients (64 men, 87.7%) aged between 21 and 80 years (mean age: 40 ± 13 years) participated in the study. Of them, 56 had episodic CH (49 men, 87.5%) and 17 had chronic CH (15 men, 88.2%). Mean age at symptom onset was 29 ± 13 years. Mean disease duration was 11 ± 9 years. Mean time between symptom onset and diagnostic was 5 ± 7 years. Patient characteristics according to CH type (episodic, chronic) are presented in Table 1.

Table 1

Demographic Attributes and Main Disease Features of Study Patients According to the Type (Episodic or Chronic) of Cluster Headache

Patient characteristics	Episodic CH N = 56	Chronic CH N = 17	All patients N = 73
Male sex (n, %)	49 (87.5)	15 (88.2)	64 (87.7)
Age (mean ± SD)	38 ± 12	46 ± 16	40 ± 13
Age at symptom onset (mean ± SD)	28 ± 12	32 ± 14	29 ± 13
Disease duration[a] (mean ± SD)	10 ± 9	14 ± 11	11 ± 9
Time to diagnostic[b] (mean ± SD)	5 ± 7	5 ± 7	5 ± 7

a: difference between current age and age at symptom onset, b: difference between age at diagnostic and age at symptom onset, CH indicates cluster headache, SD indicates standard deviation

Factor Analysis of the CLCS and CSQ Questionnaires in the Whole Sample of CH Patients

Results of factor analysis of the CLCS items are presented in Table 2. Items with factor loadings >0.4 were retained for analysis except for item 1 (disease due to fate with no personal control) and item 12 (influence of religion on disease progression). Two items were deleted because they failed to load consistently on any factor (item 5: influence of spouse and family on disease progression; item 8: influence of environmental pollution). Factor analysis yielded three varimax factors (factor 1: 9 items; factor 2: 3 items; factor 3: 3 items) which together explained 51.8% of total variance. Relatively elevated Cronbach's α coefficients indicate good consistency of the resulting item sets for each factor.

Table 2

Factor Analysis of Items of the Cancer Locus of Control Scale (CLCS) in Cluster Headache Patients

CLCS items	Factor loading		
	Factor 1	Factor 2	Factor 3
1 Disease due to fate and no personal control	-0.278	.	.
2 Personal ability to influence disease progression	0.636	.	.
6 Disease occurrence was due to lifestyle	0.713	.	.
9 Disease occurrence is patient's fault	0.626	.	.
10 Improved personal care can influence the disease	0.697	.	.
11 Events in patient's history promoted the disease	0.733	.	.
13 Improving lifestyle might influence the disease	0.623	.	.
14 Patient's personality may have promoted the disease	0.560	.	.
17 Disease occurrence was related to personal factors	0.698	.	.
4 Medical care can influence disease progression	.	0.783	.
15 Medical advice may help control disease progression	.	0.825	.
16 Struggling may influence disease progression	.	0.654	.
3 Pain Disease was due to God's will	.	.	0.900
7 God can surely influence disease progression	.	.	0.930
12 Religion may influence disease progression	.	.	0.315
Cronbach's α coefficient	0.75	0.68	0.66
Percentage of total variance explained by the factor	26.1	13.8	11.9

N = 71 patients (2 patients missing)

On the basis of items with high weight in factor 1, this factor can be interpreted as the perceived internal controllability (beliefs about personal and lifestyle influence on disease progression and about internal causes of the disease). Factor 2 can be interpreted as the perceived medical controllability of pain (beliefs about a possible influence on disease progression with the help of medical care). Factor 3 represents beliefs about the influence of religion on disease controllability.

Results of factor analysis of the CSQ items are presented in Table 3. Factor extraction was carried out on the basis of five hypothesized principal components. The model indicated that the five varimax factors contributed to 64.9% of total variance.

Table 3

Factor Analysis of Items of the Coping Strategies Questionnaire (CSQ) in Cluster Headache Patients

	Factor loading				
CSQ items	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
7 Not paying attention to pain	0.420	.	.	.	.
8 Doing as if pain did not exist	0.650	.	.	.	.
14 Going on as though nothing occurred	0.775	.	.	.	.
15 Engaging into a pleasant activity	0.758	.	.	.	.
17 Ignoring pain	0.671	.	.	.	.
2 Trying to think about something pleasant	.	0.781	.	.	.
10 Thinking about pleasant things in the past	.	0.846	.	.	.
11 Thinking about persons who are pleasant company	.	0.834	.	.	.
20 Thinking about pleasant activities	.	0.762	.	.	.
1 Trying to distance oneself from pain	.	.	0.739	.	.
5 Trying not to think about pain	.	.	0.524	.	.
6 Trying not to think that pain concerns the body	.	.	0.846	.	.
13 Trying to think that pain is outside the body	.	.	0.896	.	.
21 Doing as though pain was outside the body	.	.	0.703	.	.
3 It's terrifying and will never improve	.	.	.	0.746	.
9 Worrying all the time whether it will stop	.	.	.	0.495	.
16 Feeling that pain is no longer bearable	.	.	.	0.659	.
19 Feeling that going on is no longer possible	.	.	.	0.870	.
4 Praying God that it won't last	.	.	.	.	0.796
12 Praying for pain to disappear	.	.	.	.	0.660
18 Relying on faith in God	.	.	.	.	0.905
Cronbach's α coefficient	0.69	0.87	0.81	0.73	0.80
Percentage of total variance explained by the factor	20.8	16.7	11.7	8.2	7.5

N = 73 patients

On account of the five items allocated to factor 1, this factor may be interpreted as indicating attempts to ignore pain (by denying, disregarding or overlooking pain). The four items allocated to factor 2 appear to reflect diverting attention from pain by imagining scenes incompatible with pain (pleasant images or thoughts) or mental activity. The five-item set in factor 3 may be interpreted as reflecting attempts to reinterpret painful sensations (by conceiving and describing the painful sensations differently). The four items grouped in factor 4 and the three items in factor 5 appear to represent tendencies to dramatize pain (catastrophizing thoughts and ideation, by focusing on the negative emotional component of pain) and to rely on God or religion or good luck to cure and end the pain (Praying and Hoping) for pain adjustment.

Relationships Between Perceived Internal Controllability of Pain and Emotional Distress, and Between the Components of Emotional Distress Themselves

A positive relationship was observed between perceived internal controllability (as assessed by the summed score of the nine items of CLCS factor 1) and emotional distress (as assessed by the scores at the HAD global scale, the HAD anxiety and HAD depression/ anhedonia subscales, and the BDI) in the 73 study patients with either episodic or chronic CH (Table 4). Although generally weak, the correlation was highly significant, except for the correlation with anxiety alone (which closely neared significance, however: p = 0.0514). Thus, it appears that emotional distress increases with increasing level of perceived internal controllability of the disease.

Table 4

Relationships Between Perceived Internal Controllability of Pain and Anxiety Alone, Depression/anhedonia, Depression Alone or Anxiety and/or Depression, and Between the Components of Emotional Distress Themselves, in Cluster Headache Patients

Variable analyzed	versus:	Correlation coefficient	99% CI	Significance
Perceived internal controllability of pain	Anxiety[a]	0.229	-0.075;0.494	NS
	Depression/anhedonia[b]	0.339	0.045;0.579	p = 0.003
	Depression[c]	0.336	0.041;0.576	p = 0.004
	Anxiety and/or depression[d]	0.339	0.045;0.579	p = 0.003
Anxiety[a]	Depression/anhedonia[b]	0.417	0.135;0.636	p = 0.0002
	Depression[c]	0.375	0.086;0.606	p = 0.001
	Anxiety and/or depression[d]	0.829	0.706;0.904	p < 0.0001
Depression/anhedonia[b]	Depression[c]	0.523	0.266;0.711	p < 0.0001
	Anxiety and/or depression[d]	0.854	0.745;0.918	p < 0.0001
Anxiety and/or depression[c]	Depression[c]	0.536	0.283;0.720	p < 0.0001

99% CI indicates confidence interval of the correlation coefficient at 99% probability

a: as assessed by the score at the HAD anxiety subscale; b: as assessed by the score at the HAD depression/anhedonia subscale; c: as assessed by the score at the Beck Depression Inventory (BDI); d: as assessed by the score at the HAD global scale

N = 73 patients

Examination of individual data revealed that beliefs pertaining to internal causative attributions of the origin of the disease and to internal controllability constitute the greatest part of total CLCS score when the summed score at CLCS factor 1 is greater than 19 (possible range: 9-36), whereas the relative weight of these beliefs is less important when the factor-1 summed score is less than 12.

Inter-relationships between all anxiety and depression variables were also significant. Highest correlation coefficients were observed for the relationships between HAD global score and the scores at the HAD anxiety or HAD depression/anhedonia subscales (Table 4).

Comparison of the Groups of Patients with Episodic and Chronic Cluster Headache

The comparison between patients with episodic and chronic CH was carried out on a subset of 32 patients (30 men and 2 women, 16 patients in each group). Mean age was 44 years in both groups and patient groups did not noticeably differentiate by mean age at symptom onset (31 or 32 years), mean age at diagnostic (37 years in both groups), mean time to diagnostic after symptom onset (about 6 years in both groups), and mean disease duration (12 or 13 years). Perceived pain-related disability (HIT-6) was scored at 66 ± 5.6 for patients with chronic CH and 69 ± 6.2 for patients with episodic CH. Most patients were anxious (87% had a score of 8 or higher at the HAD anxiety subscale), half of them had anhedonia (53% had a score of 8 or higher at the HAD depression/anhedonia subscale), and two thirds were depressive (63% had a score of 4 or higher at the BDI).

There were only modest differences between the groups of patients with episodic or chronic CH with respect to emotional status, with only slightly (but not significantly) higher scores for anxiety in patients with episodic CH and for depression/anhedonia and depression in patients with chronic CH (Table 5).

Table 5

Comparison of the Groups of Patients with Episodic or Chronic Cluster Headache

Patient attributes	Patients with episodic CH N = 16	Patients with chronic CH N = 16	Statistical significance*
Emotional status			
Anxiety[a]	11 ± 3	9 ± 4	NS
Depression/anhedonia[b]	7 ± 4	8 ± 5	NS
Depression severity[c]	7 ± 5	9 ± 8	NS
Perceived locus of control of pain:			
Internal control	19 ± 5	18 ± 5	NS
Medical control	9 ± 2	9 ± 2	NS
Religious control	6 ± 2	7 ± 3	NS
Perceived social support:			
Availability	18 ± 11	12 ± 8	NS
Satisfaction with support	31 ± 5	26 ± 8	NS
Coping strategies:			
Ignoring pain sensations	6 ± 2	8 ± 3	NS
Distraction	8 ± 3	7 ± 3	NS
Reinterpreting pain sensations	11 ± 4	8 ± 2	p = 0.007
Catastrophizing	11 ± 3	11 ± 3	NS
Praying and Hoping	6 ± 3	6 ± 3	NS

a: as assessed by the HAD anxiety subscale; b: as assessed by the HAD depression/anhedonia subscale; c: as assessed by the Beck Depression inventory (BDI); *: multiple regression analysis; CH indicates cluster headache

There was no substantial difference between the two patient groups with respect to perceived control of the disease. On the other hand, perceived social support and satisfaction with support appeared somewhat higher for patients with episodic CH compared with those with chronic CH, but the between-group differences were not significant.

Regarding coping with pain, the two groups of patients did not differentiate on the strategies of Distraction, Catastrophizing, Ignoring pain sensations, and Praying and Hoping. Conversely, patients with episodic CH used significantly more frequently the strategy of Reinterpreting pain sensations compared with patients with chronic CH (p = 0.007). The type of CH (episodic or chronic) accounted for 21% of the variance of individual data for this strategy.

Discussion

This study determined, in CH patients seen in an emergency headache center, the factor structures of a scale of perceived disease control (CLCS) and of a coping questionnaire (CSQ), and data were used to compare two subsets of patients with episodic or chronic CH. Factor analysis of CLCS identified three components corresponding to perceived internal controllability of the disease, medical controllability, and religious controllability, respectively, and these components differ from the three subscales described for the original scale (internal/external controllability of disease progression, internal/external attribution of the origin of the disease, religious controllability). Perceived internal controllability was significantly correlated with depression variables (BDI, HAD depression/anhedonia subscale, HAD global scale). Factor analysis of CSQ revealed a similar item allocation to that previously described for the French version of the questionnaire, with only minor differences in individual item allocation to the factors. Comparison of subsets of patients with episodic or chronic CH did not show significant differences in emotional status, perceived locus of control of the disease and perceived social support or coping strategies, except for the strategy of Reinterpreting pain sensations which was more frequently used by patients with episodic CH than chronic CH.

Of the three CLCS components identified by factor analysis in CH patients, the nine-item component groups together items relating to both beliefs about personal responsibility in disease progression (through personal efforts and changes in lifestyle) and beliefs about internal attributions of the origin of the disease (lifestyle, patient's history or personality or other personal factors). This component corresponds to two distinct subscales in the original CLCS structure. Conversely, the second component identified contains three items related to medical support and willingness to control the disease, and may thus be interpreted as reflecting ‘fighting spirit’ (Watson et al., 1990). The three items of the second component identified in CH patients are also allocated to two different subscales (internal and external locus of control subscales) in the original CLCS structure. Finally, the three-item third component (‘religious control’) identified in CH patients matches the corresponding original CLCS subscale.

Different reasons may potentially account for the differences between the factor structure observed in our patient sample and the original CLCS subscales. One of them may be the number of questionnaires patients were administered. Although the CLCS appeared well understandable to patients, some of them seemed to get confused when asked to distinguish between the causes and consequences of the disease and about links with lifestyle. Generally speaking, patients appeared to acknowledge either some responsibility in the disease or no responsibility at all. This may explain the observed grouping in a single component of CLCS items relating to internal/external locus of control or causative attributions. Similarly, responses to items pertaining to pollution and role of close relations were generally dichotomized and were excluded from analysis. Association of medical support with definite willingness to fight against the disease may originate, in the particular case of CH patients, in the efficacy of injectable sumatriptan for the control or ajustment of attacks.

The CLCS factor 1 identified in CH patients contained chiefly items relating to internal control (except item 1–role of fate–which in fact falls on the negative side of the belief). Of the nine items of factor 1, five pertain to internal attribution of the origin of the disease, and three to personal efforts required to control disease progression. High perceived internal control over the *cause* of the illness is associated with an ‘anxious preoccupation’ about the disease (Watson et al., 1990) and may ultimately lead to depression. In fact, correlations between factor 1 summed score and measures of depression (HAD depression/anhedonia subscale, BDI score) were highly significant in CH patients, while the correlation with anxiety (HAD anxiety subscale) approached significance. Moreover, all measures of depression and anxiety were found to be significantly inter-correlated, confirming that anxiety and depression are linked in pain patients.

CSQ factor structure was analyzed on an *a priori* basis of five cognitive and behavioral pain coping strategies. Three main factors (cognitive coping and suppression, helplessness, and Diverting attention or Praying) were initially reported by the authors of the instrument (Rosenstiel & Keefe, 1983), but varied numbers of factors (5, 6 or 7 factors) were subsequently identified with the original 48-item version of the questionnaire (Swartzman, Gwadry, Shapiro, & Teasell, 1994; Riley & Robinson, 1997; Robinson et al., 1997). The five-factor structure retained for analysis in the present study corresponds to the five-factor structure previously observed for the 21-item French version of the questionnaire (Irachabal, 2002). Absence of self-statements in the French version does not appear to alter the factor structure of the scale, although negative self-statements were reported to be more predictive of psychosocial functioning than pain beliefs in chronic pain patients (Stroud, Thorn, Jensen, & Boothby, 2000). In the present study, factor allocation of two items differed from previous results with the French CSQ version: item 5 (Trying not to think about pain) was allocated to the reinterpretation strategy (instead of Ignoring pain sensations) and item 15 (Engaging into a pleasant activity) to the Ignoring pain sensations strategy (instead of Distraction). The other strategies used by CH patients appeared to contain the same items as those noted in the previous French study in patients with other painful pathologies (Irachabal, 2002).

Regarding the comparison of the two subsets of patients with episodic or chronic CH, analysis revealed no significant difference in emotional status, perceived controllability of the disease (internal, medical, religious) and perceived social support. The only significant difference between the two types of CH concerned the use of the Reinterpreting pain sensations strategy (more frequently used by patients with episodic CH). In contrast to what might have been expected, the absence of difference in perceived controllability indicated a similar degree of helplessness leading to hopelessness between the two groups of patients who also shared similar beliefs about the role of medical attention.

Nevertheless, some noticeable trends were detectable. Anxiety seemed slightly higher in patients with episodic CH, whereas depression seemed slightly higher in those with chronic CH. Drawing a parallel with migraine, uncertainty about the possible occurrence of attacks may be hypothesized to generate more anxiety in patients with episodic CH, whereas protracted periods of attacks may cause more depression in patients with chronic CH. Patients with episodic CH seemed to benefit more from social support. Slightly more patients with chronic CH used the Ignoring pain sensations strategy. These differences did not reach significance, however, probably due to the limited size of each patient subset (16 patients per group) and relatively large inter-individual variability. It needs also to be recalled that data differences between groups were analyzed after controlling for disability. Nevertheless, although limited in size and number, the differences observed between the two types of CH suggest a more ‘active’ profile for patients with episodic CH (more anxiety, greater reliance on social support, more reinterpretation of pain sensations) and a more ‘passive’ profile for patients with chronic CH (more depression, less social support, more attempts to ignore pain).

One possible limitation of the study is that it was conducted among CH patients seen in an emergency headache center, which may have influenced in some way the characteristics of the patient sample. Another limitation may be the small number of patients included in the subsets of patients with episodic or chronic CH (a consequence of the need for obtaining well-matched patient subsets with respect to patients' characteristics). Furthermore, a single instrument was used for the exploration of coping strategies. In fact, CSQ only explores *cognitive* coping strategies but let aside *behavioral* coping strategies. Complementary use of Chronic Pain Coping Inventory (Jensen, Turner, Romano, & Strom, 1995; Hadjistavropoulos, MacLeod, & Asmundson 1999), which is more strongly oriented to functioning and behavioral strategies of coping with pain, would perhaps have contributed to a more distinct differentiation of the respective profiles of episodic and chronic CH patients. However, time constraints forced to limit the number of questionnaires administered to study patients (an average of two hours was required to administer the whole battery of study questionnaires, taking account of resting intervals and time for medical support and for advice and possible referral). On the other hand, a possible strength of the study may be the relatively short duration of data collection (nine months), due to unique recruitment facilities (more than 8 000 patients are seen in the Emergency headache center in a year, of whom about 400 are CH patients), which ensures relative homogeneity of measures.

In conclusion, this study showed that the factor structure of perceived disease controllability in CH patients may be somewhat different from that reported for other painful pathologies. This difference may be linked with specificities of the disease, especially the excruciating intensity of CH pain. However, the coping strategies used by CH patients do not seem to diverge noticeably from other painful diseases. Finally, comparison of subsets of patients with episodic or chronic CH suggested a more passive profile for those with chronic CH and this deserves substantiation in further studies involving larger groups of patients.

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