

## Emotive and Behavior Problems in Adolescents with Chronic Daily Headache

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### Abstract

**Introduction:** many studies have examined the association between pediatric headache and psychopathology; some of them raised the possibility that headache frequency and severity could be worsened by a reduced psychological ability to mentally process emotions and affects.

**Aim:** The aim of this study was to assess psychopathological comorbidity in adolescents with chronic daily headache (CDH) compared to adolescents with non-chronic headache.

**Method:** We conducted a retrospective study of 42 patients (20 boys and 22 girls; mean age 14) and their mothers, consecutively first seen for therapy-resistant headache in our third-level Child Neuropsychiatry Unit National Neurological Institute "C. Mondino" of Pavia, between November 2012 to January 2014. They were assessed using Parent Child Behaviour Checklist (CBCL) and Youth Self-report (YSR). A detailed history was taken to assess the presence of headache, using criteria defined by International Headache Society (ICHD-3 beta).

**Results:** 21 (50%) of 42 enrolled patients presented a form of Chronic Daily Headache – CDH: ten patients had Chronic Migraine, one Probable Chronic Migraine, eight adolescents Chronic Tension-type Headache and two girls Probable Chronic Tension-type Headache. They had at the YSR higher levels of Somatic Complaints ( $P=0.006$ ), Thought Problems ( $P=0.003$ ) and ADHD symptoms ( $P=0.049$ ). At the CBCL, their mothers reported higher levels of Somatic Complaints ( $P=0.045$ ) and lower Total Competences ( $P=0.012$ ).

**Conclusion:** This study confirmed that CDH are associated with a higher level of impairment and with a heavier psychopathological burden. It is possible that the presence of a significant degree of alexythymia in these patients could be associated to the worsening both of headache and of psychopathological aspects.

**Key Words:** Chronic headache; Emotive problems; Behavior; Adolescents

**Abbreviations:** CBCL: Child Behavior Checklist; YSR: Youth Self-Report; CDH: Chronic Daily Headache

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### Introduction

Headache represents one the most frequent neurological symptom complained in childhood and adult life. The Global Burden of Disease Survey 2010 denominated migraine "the seventh disabler" in order to underline the very high frequency of this problem and the huge impact on patients' lives [1]. More recently, it has been raised the possibility that headache disorders were the third cause of disability worldwide [2].

The estimated overall mean prevalence of headache was 54.4% and the overall mean prevalence of migraine was 9.1% considering the results from 64 cross-sectional studies have been identified, published in 32 different countries and including a total of 227,249 subjects [3].

It's very important to measure the impact of headache in terms of health status, functioning and quality of life. Different reviews show that the impact of headache in children and adolescents is

substantial: headache is the major factor contributing to school absenteeism and poorer quality of life [4, 5].

So the researches about factor as well the psychological factor that can influence natural history and management of headache the is critical.

Multiple researches revealed that chronic pain influences both adolescents and parents: the adolescents present high levels of disability, depression and anxiety, while their parents often report high levels of depression and anxiety, as well as in increased level of stress [6].

In children and adolescents life events and their psychological features have great importance either as a predisposing factor, inducing a chronic state of anxiety or depression (even subclinical), or as a trigger factor, activating biological mechanisms that can results as headache [7].

This aetiopathogenetic hypothesis has important implications in terms of diagnostic and therapeutic choices for children and adolescents with migraine. In fact the relationship between psychopathology and headache was pointed out by the use of psychological therapy in the management of idiopathic headache in childhood and adolescence. Different studies [7-9] underlined the efficacy of this kinds of treatment draw attention on the fact that the improvement of cephalalgia symptoms is related to the efficacy of a psychological support.

Chronic daily headache (CDH) is defined by the presence of primary headache on at least 15 days per month for >3 consecutive months without an identifiable organic cause [10]. There are four subtypes of CDH: chronic migraine (CM), chronic tension-type headache (CTTH), new daily persistent headache and hemicrania continua. Prevalence is estimated between 0.2% to 7.1% [11, 12].

A recent study estimated that CDH persistence rates were 40% in the first year after the appearance and 25% in the second year. Independent predictors for CDH persistence were medication overuse and major depression: this once more underlined the role of psychopathology in the genesis and retention of headache [13].

Chronic daily headache is multi-faceted, often complex pain syndrome in children and adolescents. It's co-morbid with adverse life events, anxiety and depressive disorders, possibly with other psychiatric disorders, other pain syndromes and sleep disorders; all these conditions contribute to beginning and maintaining CDH [14].

A complex relationship between recurrent headache, school absenteeism and depression in adolescents was evidenced in a study showing that adolescents who missed more than 2 days per month had higher scores on the Children's Depression Inventory and lower academic performance than students who attended school more regularly [15].

The aim of this study is to confirm data already acquired about psychopathology in adolescent with headache and explore in details the CDH sub-type: the psychological traits characteristically associated through the point of view of mothers and child themselves, the level of disability and comorbidities associated.

## Method

### Participants

We retrospectively reviewed all charts of 66 adolescents (aged 11.0-17.11) with therapy-resistant headache, newly-admitted to the outpatient childhood headache service at our third-level Child Neuropsychiatry Unit National Neurological Institute "C. Mondino" of Pavia, between November 2012 to January 2014.

Mothers of the participants in this study were also recruited and invited to participate in the psychological and personality trait assessments. Inclusion criteria were: a) meeting diagnostic criteria for Chronic Migraine (CM) or Chronic Tension-type Headache (CTTH) according to the ICDH-III Beta version (2013) [16]; b) informed consent provided by parents (for legal reasons) and by the patient. Exclusion criteria were: a) patients under 11 years of age, b) a diagnosis of any other non-chronic headache or chronic pain condition, c) parental refusal to participate to the study.

Each recruited patient received a comprehensive physical and neurological assessment. The psychological evaluation included administration of the Child Behaviour Checklist (CBCL) filled by mothers and of the Youth Self-Report (YSR) filled by the patients.

### Measures

Child Behaviour Checklist (CBCL) is a structured questionnaire completed by parents of children aged 6-18 years, in this study by mothers, that explore different aspects of the adolescents using 113 items organized in 8 different domains: Withdrawn, Somatic Complaints, Anxious/Depressed, Social Problems, Thought Problems, Attention Problems, Delinquent Behavior and Aggressive Behavior. It's explored also internalization which is the propensity to express distress inwards; common internalizing disorders include mood and anxiety disorders and employ answers of Withdrawn, Somatic Complaints and Anxious/Depressed domains. In contrast, externalization describes the propensity to express distress outwards; commonly recognized externalizing disorders include attention-deficit/hyperactivity disorder, oppositional defiant disorder, conduct disorder, antisocial personality disorder, and substance use disorders and employ answers of Delinquent Behavior and Aggressive Behavior domains. The Total Problems scale is a general summary of almost all answers and this parameter is use to judge whether a child shows fewer competencies or more problems than a normal adolescent of the same sex and age [17].

Youth Self-Report (YSR) is an 112-items self-report for adolescents aged 11-18, as CBCL assess competencies and psychopathology (behavioral and emotional problems) in children and adolescents in dimensional terms. YSR has nearly identical content to the CBCL, organized into similar scales. Both questionnaires revealed themselves as appropriate methods that support and increase validity of the psychiatric diagnoses [18, 19].

### Data analysis

Standard descriptive statistics were obtained for all variables of interest. Significance of differences in subgroups was analyzed with parametric or non-parametric tests according to variable distribution. A P-value of <0,05 was used as the cut-off point for statistical significance; were indicate, a Bonferroni post-

hoc correction was applied to reduce the effect of multiple comparisons.

## Results

66 patients aged 11.0-17.11 were referred to our Unit for

headache between November 2012 to January 2014; 42 of them were included in this study. 20 patients were male (47,6%) and 22 girls (52,4%); mean age 14,17. 21 (50%) of 42 enrolled patients presented a form of Chronic Daily Headache – CDH (Chronic Migraine, Probable Chronic Migraine, Chronic Tension-type Headache, Probable Chronic Tension-type Headache): 10 patients

**Table 1** Results of YSR (Youth Self-Report).

YSR	PTS witc CDH (T score median value)	PTS witc Non-CDH (T score median value)	p-value
TOTAL PROBLEMS	53	50	0,96
INTERNALIZING PROBLEMS	60,5	58	0,15
ESTERNALIZING PROBLEMS	47	48	0,85
ANXIOUS/DEPRESED	59	54	0,66
WITHDRAWN	51	54	0,75
<b>SOMATIC COMPLAINTS</b>	<b>65</b>	<b>58</b>	<b>&lt;0,05</b>
SOCIAL PROBLEMS	52	51	0,12
<b>THOUGHT PROBLEMS</b>	<b>54</b>	<b>51</b>	<b>&lt; 0,05</b>
ATTENTION PROBLEMS	53	51,5	0,09
RULE-BREAKING BEHAVIOR	50	51	0,67
AGGRESSIVE BEHAVIOR	51	51	0,55
ACTIVITIES	35,5	41,5	0,1
SOCIAL	36,5	43	0,34
SCHOOL			
TOTAL COMPETENCE	32	39	0,16
AFFECTIVE PROBLEMS	55	53	0,37
ANXIETY PROBLEMS	55	53,5	0,37
SOMATIC PROBLEMS	65	61,5	0,08
<b>ADHD</b>	<b>54</b>	<b>51,5</b>	<b>&lt;0,05</b>
OPPOSITIONAL DEFIANT PROBLEMS	51	52	0,65
CONDUCT PROBLEMS	50	50	0,86

**Table 2** Results of CBCL (Child Behaviour Checklist).

CBCL	PTS witc CDH's MOTHERS (T score medium value)	PTS witc Non-CDH 's MOTHERS (T score medium value)	p-value
TOTAL PROBLEMS	60	57	0,23
INTERNALIZING PROBLEMS	67,5	63	0,13
ESTERNALIZING PROBLEMS	52,5	54	0,78
ANXIOUS/DEPRESED	65	57	0,4
WITHDRAWN	57	58,5	0,86
<b>SOMATIC COMPLAINTS</b>	<b>70</b>	<b>64</b>	<b>&lt; 0,05</b>
SOCIAL PROBLEMS	61	54	0,36
THOUGHT PROBLEMS	56	54	0,75
ATTENTION PROBLEMS	56	56	0,97
RULE-BREAKING BEHAVIOR	51	52	0,58
AGGRESSIVE BEHAVIOR	55	54,5	0,75
ACTIVITIES	31	40	0,07
SOCIAL	40	43	0,44
SCHOOL	50	52	0,22
<b>TOTAL COMPETENCE</b>	<b>34</b>	<b>40</b>	<b>&lt; 0,05</b>
AFFECTIVE PROBLEMS	63	59,5	0,2
ANXIETY PROBLEMS	62	61	0,81
SOMATIC PROBLEMS	68	67	0,25
ADHD	56	56	0,87
OPPOSITIONAL DEFIANT PROBLEMS	55	52	0,36
CONDUCT PROBLEMS	51	51	0,65

(7 girls and 3 boys) had Chronic Migraine, 1 girl Probable Chronic Migraine, 8 adolescents (4 girls and 4 boys) Chronic Tension-type Headache and 2 girls Probable Chronic Tension-type Headache.

**(Table 1 and 2)** provides the comparison between subjects with chronic and non-chronic headache in terms of the different scale of the CBCL and of the YSR.

At the YSR adolescents with Chronic Headache had higher levels of Somatic Complaints ( $P=0.006$ ), Thought Problems ( $P=0.003$ ) and ADHD symptoms ( $P=0.049$ ), compared to peers with non-chronic headache. At the CBCL, mothers of patients with CDH reported higher levels of Somatic Complaints ( $P=0.045$ ) and lower Total Competences ( $P=0.012$ ) compared to mothers of subjects with non-chronic headaches.

## Conclusion

Half of the patients enrolled had a chronic-type of headache; girls ( $N=14$ , 66,6%) were more than boys ( $N=7$ , 33,4%). Although this difference in prevalence has been consistently reported, the reason has not been understood in detail; specific hormonal and biochemical mechanisms might contribute to these sex differences [20]. In a previous study a group of headache patient was studied and results that scores obtained by the clinical sample in CBCL and SAFA are generally higher than scores obtained by the control group and that internalizing symptoms (anxiety and depression) in children correlate with mothers' point of view outlining a tight link between headache patients and their mothers [21].

Studies suggest that adolescent recurrent pain is very common, that anxiety and depression at age 10-11 years is predictive of higher levels of pain and that psychosocial factors can predict trajectories of recurrent pain over time across adolescence [22].

The coexistence of anxiety and depressive symptoms in

adolescents has been repeatedly associated with recurrent headache and determines a poorer outcome for headache management and more disability. Early identification and management of risk factors is important and may lead to better headache treatment and more effective strategies to prevent headache from becoming a chronic disorder [23]. Depression is the psychopathological aspect more consistently correlated with headache in adolescents and is associated with parent-adolescent conflict, poor family functioning and low level of autonomy [24].

Chronic Headache is a predictor of behavioural and emotional problems. The presence of somatic complaints is more significative in CDH patients: chronic headache, as other chronic pain, has an emotional component [25].

Recurrent pain symptoms especially headache in children are associated with psychiatric co-morbidities that could complicate treatment and anxiety and depression are reported as the most prevalent.

It is interesting that patients with CDH tend to obtain lower scores in Total Competence scale in CBCL completed by their mother. This can correlate with a reduced quality of life in adolescents with chronic pain, as frequent headaches during adolescence can have a negative impact on activity levels and psychological functioning. Children with migraine are more often absent from school activities, can have difficulties in performing homework as well as any home activity, and tend to reduce the participation in leisure activities: the presence of headache influence negatively general, physical and psychosocial quality of life [26].

The results of our study confirm the already known presence of ADHD or ADHD-like symptoms in some patients with CDH. Headache in children and adolescences is often connected with

severe cognitive, emotional, and behavioral impairments, which can be read by the mothers as symptoms of ADHD [27].

This study confirmed that CDH is associated with a higher level of impairment and with a heavier psychopathological burden. It is possible that the presence of a significant degree of alexythimia in these patients could be associated to the worsening both of headache and of psychopathological aspects.

## Conflict of Interest

The authors report no conflict of interest.

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