Rapid Communication

Stress Related Determinants of Anxiety and Depression in Young Girls with Chronic Headache

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Abstract

Girls with chronic headache often suffer also from marked anxiety and depression. The present study used psychological and biological characteristics related to stress load and stress coping to predict anxiety and depression. This was done by regression analysis. Anxiety could be better explained than depression. Psychological and physiological stress load played a significant role, but not activity of HPA axis, although cortisol awakening response was heightened specifically for headache sufferers.

Keywords: Headache; Adolescents; Stress load; Stress coping; Anxiety; Depression

Introduction

Chronic headache in children and adolescents is frequent. A meta-analysis of [1] was based on data of 50 studies, which were published worldwide and included 80,000 patients. Lifetime prevalence of chronic headache was 58.4%. For migraine in particular 7, 7% are reported, whereby the prevalence for girls is greater than for boys.

Stress load in daily life of adolescents with chronic headache is heightened, which has been shown in a study of [2] in 113 school girls.

The interrelationship between stress and headache in the long-term has been confirmed also by [3].

A very high stress load in university students with chronic headache was observed in a case-control study of [4]. When a high stress load was present in young college students, headache was significantly more present than other somatic complaints [5].

School absenteeism as an indicator of stress load has been found in adolescents with chronic headache by [6].

On the other hand stress coping of youth with chronic headache is characterized by widely inadequate strategies. This has been demonstrated in a study of [7] by using projective test methods.

A long-term study of [8] found a high comorbidity of headache and anxiety as well as depression.

This was supported by [9].

A third study by [10] presented the same results.

The empirical evidence suggests that girls with headache are suffering from more stress load and on the other hand are not able to cope adequately with stress. The present investigation is an attempt to confirm previous results. As an extension to previous findings anxiety and depression were assessed and influences on these psychopathological characteristics were identified.

Methods

All participants with headache were recruited in schools and had to fulfill ICHD-3 criteria for migraine or tension-type headache. The control group was recruited on the University campus in Trier. Before participation, acute diseases were excluded by a medical doctor.

20% of the girls fulfilled the criteria for migraine, 70 % criteria for tension-type headache, the rest could not be classified definitely.

Stress load was assessed by the questionnaire for stress and stress coping for children and adolescents (SSKJ) [14].

The subscales comprise 1) Vulnerability to stress; 2) Physical symptoms of stress such as headache, stomach ache or exhaustion. 3) Psychological symptoms of stress such as depressed mood and anxiety.

Depression and anxiety of the children were measured by [12,13].

Results

Results of regression analyses to predict depression or anxiety

The multiple linear regression analyses were done systematically using different predictors related to stress load and stress coping.

Regression analysis 1

Dependent variable was depression

Predictors were psychological stress load and destructive stress coping and mean cortisol 60 minutes after awakening.

The regression equation was significant with $F_{(3.144)} = 29.9$ p <0.001 and explained variance of 38%. Significant predictors were psychological stress load and destructive coping.

Regression analysis 2

Dependent variable was depression

Predictors were psychological and physiological stress load and destructive stress coping.

the regression equation was significant with $F_{(4.143)} = 22.6$ p<0.001 and explained variance of 37%. Significant predictors were physiological and psychological stress load and destructive coping.

Table 1: Stress load for girls with chronic headache and controls.

	Controls	Chronic Headache
Physical stress load	7.3 ± 1.7	8.8 ± 2.4
Psychological stress load	18.0 ± 4.5	21.4 ± 5.4
Stress vulnerability	15.3 ± 2.5	16.2 ± 2.5

Comparison of mean values with MANOVA revealed F (3.145) = 9.4 p<0.001. Girls with headache had physically as well as psychologically more stress load and were also more vulnerable against stress situations.

Table 2: Stress coping in girls with chronic headache and controls.

Stress Coping	Controls	Chronic Headache
Seeking social support	36.2 ± 7.8	34.1 ± 6.6
Problem solving	45.3 ± 7.4	44.8 ± 6.9
Destructive and anger	23.8 ± 7.5	26.1 ± 7.8
Passive avoidance	23.9 ± 6.1	25.2 ± 6.2
Constructive	27.1 ± 7.7	29.8 ± 8.8

Comparison of means with MANOVA revealed F (5.143) = 2.3 p <0.05. Excluding constructive coping stress coping was more inadequate in girls with chronic headache. This could mean that the girls have some positive resources to react in stress situations that should be further supported during treatment programs.

Table 3: Anxiety and depression in girls with chronic headache and controls.

	Controls	Chronic Headache
Anxiety	30.8 ± 5.7	35.3 ± 6.4
Depression	9.3 ± 4.9	12.1 ± 6.5

Comparison of group means with MANOVA yielded F (2.146) = 10.9 p<0.001. Girls with headache were significantly more anxious and depressed.

Table 4: Cortisol after awakening for girls with chronic headache and controls in nmol/ml.

Time of Sample	Controls	Chronic Headache
Awakening	8.2 ± 4.5	6.8 ± 3.5
30 minutes	9.8 ± 56	10.4 ± 6.3
45 minutes	8.3 ± 5.3	9.3 ± 6.0
60 minutes	6.6 ± 4.8	7.2 ± 5.0

Group means were analyzed by MANOVA for repeated measurement. A significant interaction cortisol by group was obtained F (3.145) = 4.6 p<0.05. Excluding awakening the mean values for patients with headache were significantly higher.

Regression analysis 3

Dependent variable was depression

Predictors were psychological and physiological stress load and constructive coping, and mean cortisol 60 minutes after awakening the regression equation was significant with F (4.148) = 26.4 p<0.001 and explained variance of 40%. Significant predictor was psychological stress load.

Regression analysis 4

Dependent variable was anxiety

Predictors were psychological stress load and destructive stress coping and mean cortisol 60 minutes after awakening.

The regression equation was significant with F (4.148) = 33.0 p<0.001 and explained variance of 39%. Significant predictors were psychological stress load and destructive coping.

Regression analysis 5

Dependent variable was anxiety

Predictors were physiological stress load and destructive coping and mean cortisol 60 minutes after awakening..

The regression equation was significant with F (4.148) = 34.5 p<0.001 with an explained variance of 48%. Significant predictors were physiological stress load and destructive coping.

Regression analysis 6

Dependent variable was anxiety

Predictors were physiological and psychological stress load and constructive coping and mean cortisol 60 minutes after awakening.

The regression equation was significant with F (4.148) = 26.1 p<0.001 and an explained variance of 41%. Significant predictors were psychological and physiological stress load and constructive coping.

Discussion

Our results with respect to the significance of anxiety and depression have also been found by [9] and were integrated in a psychobiological model of chronic headache in adolescents.

A strong relationship of stress and headache in particular in adolescents is also reported by [10] and is well in accordance with our data.

Cortisol may be able to reduce pain sensitivity. As a consequence, girls with chronic headache may have a very early perception of the beginning of headache and therefore believe it to be very heavy, especially when they are anxious in addition [11].

The findings have limitations. Sample size was small. Only girls were investigated, a generalization to boys is not possible, but girls are much more affected by headache. Some clinical implications are shortly outlined. The importance of stress and psychopathological features of youth with headache is a recommendation to pay special attention on both aspects in treatment programs, that could be school-based or offered in a group format also including when necessary family members.

References

1. Abu-Arafeh I, et al. Prevalence of headache and migraine in children and adolescents: a systematic review of population-based studies. Developmental Medicine and Child Neurology. 2010; 52: 1088-1097.

2. Carlsson J, et al. Psychosocial functioning in schoolchildren with recurrent headaches. Headache. 1996; 36: 77-82.

3. Waldie K. Childhood headache, stress in adolescence, and primary headaches in young adulthood: a longitudinal cohort study Headache. 2001; 41: 1-10.

4. Moon H, et al. Perceived stress in patients with migraine: a case-control study Journal of Headache and Pain. 2017; 18.

5. Zouini B, et al. Somatic health and its association with negative psychosocial factors in a sample of Moroccan adolescents SAGE Open Med. 2019; 7: 205031211.

6. Rousseau-Salvador C, et al. Anxiety, depression and school absenteeism in youth with chronic or episodic headache. Pain Res Manag. 2014; 19: 235-240.

7. Balottin L, et al. Rorschach Evaluation of Personality and Emotional Characteristics in Adolescents with Migraine Versus Epilepsy and Controls Front Neurol. 2018; 9: 160.

8. Blaauw B, et al. The relationship of anxiety, depression and behavioral problems with recurrent headache in late adolescence - a Young-HUNT follow-up. The Journal of Headache and Pain. 2015; 16: 10.

9. Anttila P, et al. Psychiatric Symptoms in Children with Primary Headache. J. Am. Acad. Child Adolesc. Psychiatry. 2004; 43: 4.

10. Mazzone L, et al. Behavioural and temperamental characteristics of children and adolescents suffering from primary headache. Cephalalgia. 2005; 26: 194-201.

11. Benson S, et al. Cortisol affects pain sensitivity and pain-related emotional learning in experimental visceral but not somatic pain: a randomized controlled study in healthy men and women. Pain. 2019.

12. Stiensmeier-Pelster J, et al. Depression inventory for children. Göttingen. 2000. Hogrefe

13. Unnewehr S. State-Trait Anxiety Inventory for Children German translation. 1992.

14. Lohaus A, et al. Questionnaire to measure stress load and stress coping in children. Göttingen. 2006 Hogrefe.