INTERNATIONAL MULTIDISCIPLINARY JOURNAL FOR RESEARCH & DEVELOPMENT
SJIF 2019: 5.222 2020: 5.552 2021: 5.637 2022:5.479 2023:6.563 2024: 7,805
eISSN :2394-6334 https://www.ijmrd.in/index.php/imjrd Volume 12, issue 04 (2025)

CORTISOL LEVELS AND ANXIETY SEVERITY IN ADOLESCENTS WITH NEUROCIRCULATORY DYSTONIA

Abdulkhakova R.M.
Andijan state medical institute Uzbekistan, Andijan

Abstract: This study examines the relationship between serum cortisol levels and the severity of anxiety in adolescents with neurocirculatory dystonia (NCD). The results demonstrate significantly higher cortisol concentrations in the NCD group, accompanied by elevated scores on the State-Trait Anxiety Inventory. These findings suggest a potential role of hypothalamic-pituitary-adrenal (HPA) axis hyperactivity in the emotional and autonomic dysregulation observed in NCD.
Keywords: neurocirculatory dystonia, cortisol, anxiety, adolescents, HPA axis.

Introduction

Neurocirculatory dystonia (NCD), a form of somatoform autonomic dysfunction, is frequently diagnosed during adolescence—a developmental period marked by substantial hormonal and psychological changes. The condition is characterized by a variety of autonomic symptoms, including tachycardia, hypotension, dizziness, and emotional lability, with anxiety being a common comorbidity [1, 2]. Recent findings have emphasized the contribution of the hypothalamic-pituitary-adrenal (HPA) axis to stress-related disorders [3, 6]. Cortisol, the end product of this axis, is a key biomarker of physiological stress and may play a role in the manifestation and severity of anxiety symptoms in NCD [4, 7, 9]. This study aims to investigate the link between morning serum cortisol levels and the degree of anxiety in adolescents with NCD.

Materials and Methods

Study Design and Participants. A cross-sectional study was conducted on 84 adolescents aged 14 to 17 years. Participants were divided into two groups: Group I (NCD group): 54 adolescents diagnosed with NCD based on clinical criteria [1, 2].Group II (Control group): 30 age- and sex-matched healthy individuals. Exclusion criteria included endocrine disorders, chronic inflammation, or recent use of corticosteroids or psychotropic medications [4].Clinical and Psychological Assessment. Anxiety was assessed using the Spielberger State-Trait Anxiety Inventory (STAI), which has been widely validated in both clinical and non-clinical populations [5]. Laboratory Investigations.Morning cortisol was measured using chemiluminescent immunoassay methodology, which provides high sensitivity for detecting HPA axis activity [6, 7].

Results

The positive correlation observed between cortisol levels and trait anxiety in adolescents with NCD aligns with prior evidence of neuroendocrine dysregulation in affective disorders [8, 9].

To quantitatively assess the differences between adolescents with NCD and healthy controls, cortisol levels and anxiety scores were measured. The results are presented in the table below:

Table 1. Cortisol levels and anxiety scores in adolescents with NCD and the control group.

Parameter	NCD Group (n=54)	Control Group (n=30)	p-value
Morning cortisol (nmol/L)	490.2 ± 35.6	347.8 ± 28.4	< 0.01

State Anxiety Score	48.3 ± 5.2	36.5 ± 4.9	< 0.01
Trait Anxiety Score	51.1 ± 6.1	38.9 ± 5.3	< 0.01

A significant positive correlation was observed between cortisol levels and trait anxiety scores in the NCD group. No significant correlation was found in the control group.

Discussion.

The data suggest that adolescents with NCD have higher levels of serum cortisol and greater anxiety, both in terms of state and trait dimensions. These findings are consistent with previous research indicating dysregulation of the HPA axis in stress-related conditions [6, 8, 9]. The observed correlation between cortisol levels and trait anxiety implies a chronic activation of the HPA axis. This mechanism may underlie both emotional and somatic manifestations of NCD [3, 10]. Similar patterns have been documented in adolescents with generalized anxiety disorder and other forms of somatoform dysregulation [11, 12].From a developmental perspective, adolescence represents a period of heightened vulnerability to stress due to neurohormonal transitions, which may exacerbate HPA hyperreactivity and emotional instability [4, 7]. These findings support the need for multidimensional treatment strategies that include both psychotherapeutic and neuroendocrine components [3, 12].

Conclusion

Future longitudinal and interventional studies are warranted to further elucidate the causal relationships and assess the effectiveness of treatments targeting HPA axis modulation in this patient population. The findings of this study provide compelling evidence for the role of the hypothalamic-pituitary-adrenal (HPA) axis in the development and maintenance of anxiety symptoms in adolescents with neurocirculatory dystonia (NCD). The significantly elevated cortisol levels observed in the NCD group, in conjunction with higher scores on the State-Trait Anxiety Inventory, indicate a dysregulated stress response system [3, 4, 6]. These findings underscore the clinical importance of incorporating neuroendocrine assessments into the evaluation and treatment planning for adolescents with NCD [3, 11, 12]. The positive correlation between cortisol concentration and trait anxiety suggests that adolescents with a sustained predisposition to anxiety may experience chronic activation of the HPA axis. This may, in turn, exacerbate autonomic dysfunction, contributing to the persistence and severity of NCD symptoms.

These findings underscore several important clinical implications:

1. Neuroendocrine screening (including cortisol levels) may be useful in the diagnostic and prognostic assessment of adolescents with NCD and anxiety.

2. Integrative treatment approaches combining psychotherapeutic and neuroendocrine-targeted strategies could enhance therapeutic outcomes.

3. Preventive strategies aimed at stress reduction in at-risk adolescents (e.g., mindfulness, biofeedback, behavioral therapy) may reduce both anxiety symptoms and autonomic dysregulation.

References

1. 1.Алексеев В.В., Жуков А.Н. Нейроциркуляторная дистония: руководство для врачей. — М.: ГЭОТАР-Медиа, 2014.
2. Пальчун В.Т. Руководство по клинической неврологии. Том 2. — М.: Медицина, 2012.
3. Громова О.А., Смирнов А.А., Шестакова И.Н. Гипоталамо-гипофизарно-надпочечниковая система и стресс: патогенетические и клинические аспекты. // Вестник РАМН. — 2017. — №3. — С. 45–52.
4. Мельниченко Г.А. Эндокринология подросткового возраста. — М.: МЕДпресс-информ, 2019.
5. Spielberger, C.D., Gorsuch, R.L., & Lushene, R.E. (1970). Manual for the State-Trait Anxiety Inventory (STAI). Palo Alto, CA: Consulting Psychologists Press.
6. Kudielka, B.M., Hellhammer, D.H., & Wüst, S. (2009). Why do we respond so differently? Reviewing determinants of human salivary cortisol responses to challenge. Psychoneuroendocrinology, 34(1), 2–18.
7. Gunnar, M.R., & Quevedo, K. (2007). The neurobiology of stress and development. Annual Review of Psychology, 58, 145–173.
8. Burke, H.M., Davis, M.C., Otte, C., & Mohr, D.C. (2005). Depression and cortisol responses to psychological stress: A meta-analysis. Psychoneuroendocrinology, 30(9), 846–856.
9. McEwen, B.S. (2007). Physiology and neurobiology of stress and adaptation: central role of the brain. Physiological Reviews, 87(3), 873–904.
10. Young, E.A., Abelson, J.L., & Cameron, O.G. (2005). Anxiogenic effects of the CRH1 receptor antagonist R121919 in humans: Relationship to HPA axis function. Psychoneuroendocrinology, 30(5), 525–534.
11. Левченко Ю.Н., Лисицын Ю.П. Психическое здоровье и адаптационные реакции у подростков. // Журнал неврологии и психиатрии им. С.С. Корсакова. — 2021. — Т. 121, № 4. — С. 75–81.
12. Сапожников М.Г. Нейроэндокринные механизмы тревожных расстройств у подростков. // Российский психиатрический журнал. — 2020. — № 2. — С. 43–48.