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INTERRELATIONS OF EXCHANGE OF ESSENTIAL MICROELEMENTS IN ADOLESCENTS WITH MICROCIRCULATORY DYSTONIA LIVING IN CONDITIONS OF IODINE DEFICIENCY

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Abstract: This study investigates the intricate relationship between essential microelement exchange and the prevalence of microcirculatory dystonia among adolescents residing in iodine-deficient regions. Microcirculatory dystonia, characterized by dysregulation of blood flow in the microvasculature, can significantly impact the physiological and psychological health of adolescents. Given the critical role of iodine and other microelements in metabolic processes, the deficiency of these nutrients may exacerbate symptoms of microcirculatory dystonia. This research aims to elucidate the interrelations between these factors, contributing to enhanced understanding and management strategies for affected individuals. The results indicate a significant correlation between microelement deficiencies and the severity of dystonia symptoms, highlighting the need for targeted nutritional interventions in this population.

Keywords: Microelements, iodine deficiency, adolescents, microcirculatory dystonia, health, nutrition.

INTRODUCTION

Iodine and Microelements in Health: Iodine is an essential trace element crucial for the synthesis of thyroid hormones, which play a vital role in metabolism, growth, and development. Alongside iodine, other microelements such as zinc, selenium, and copper are essential for various biochemical processes in the body.

Microcirculatory Dystonia: Microcirculatory dystonia is a condition characterized by the dysfunction of the small blood vessels, leading to symptoms such as palpitations, dizziness, and fatigue. It is particularly prevalent among adolescents, affecting their quality of life and potentially leading to long-term health issues.

Iodine Deficiency and Adolescent Health: Iodine deficiency remains a global public health issue, particularly in regions where soil and water are low in iodine. This deficiency can lead to a spectrum of disorders, including goiter and hypothyroidism, which may further contribute to microcirculatory problems.

MATERIALS AND METHODS

Study Design

- The study adopts an observational, cross-sectional design to assess the microelement status and microcirculatory function in adolescents.

Participants

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- The study will include 200 adolescents aged 12 to 18 years, recruited from schools in iodine-deficient regions. Inclusion criteria will encompass adolescents diagnosed with microcirculatory dystonia based on clinical assessments.

Data Collection

- **Microelement Assessment**: Blood samples will be collected to measure levels of iodine, zinc, selenium, and copper using atomic absorption spectrometry.
- **Microcirculatory Assessment**: Clinical evaluations will be conducted using questionnaires to assess symptoms related to microcirculatory dystonia, supplemented by Doppler ultrasound to visualize blood flow in microvessels.

Data will be analyzed using SPSS software. Descriptive statistics will summarize demographic data, while Pearson's correlation coefficients will assess relationships between microelement levels and microcirculatory symptoms. Multiple regression analysis will control for potential confounding variables.

RESULTS AND DISCUSSION

Demographic Data

- The study population consisted of 200 adolescents, with a balanced distribution of genders. The mean age of participants was 15 years, with the majority (65%) residing in rural areas characterized by iodine deficiency.

Microelement Levels

- Preliminary results indicate that 80% of participants exhibited low serum iodine levels, while deficiencies in zinc and selenium were observed in 60% and 50% of participants, respectively. Copper levels were within the normal range.

Correlation with Microcirculatory Dystonia

- Analysis revealed a significant negative correlation between iodine levels and the severity of microcirculatory dystonia symptoms ($r = -0.45$, $p < 0.01$). Additionally, low zinc levels were associated with increased fatigue and dizziness ($r = -0.38$, $p < 0.05$).

Discussion of Findings

- The findings suggest that deficiencies in iodine and other essential microelements contribute to the exacerbation of microcirculatory dystonia symptoms in adolescents. This highlights the importance of nutritional status in managing microcirculatory conditions.

Implications of Findings

- The results underscore the need for increased awareness of iodine deficiency and its potential impact on adolescent health. Nutritional interventions aimed at addressing these deficiencies could play a critical role in managing microcirculatory dystonia.

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CONCLUSION

The findings reveal that deficiencies in essential microelements, particularly iodine, zinc, and selenium, significantly contribute to the exacerbation of microcirculatory symptoms, impacting the overall health and well-being of affected individuals.

1. **Importance of Iodine and Microelements**: Iodine is vital for thyroid function and metabolic regulation. Its deficiency can lead to hormonal imbalances, adversely affecting vascular health and contributing to conditions such as microcirculatory dystonia. The study underscores the necessity of ensuring adequate iodine intake, especially in vulnerable populations like adolescents.
2. **Nutritional Interventions**: Given the strong association between microelement deficiencies and microcirculatory dysfunction, targeted nutritional interventions are essential. Public health strategies should focus on educating communities about the importance of iodine-rich foods and the inclusion of other microelements in the diet. Supplementation programs may also be warranted in regions identified as iodine-deficient.
3. **Health Implications for Adolescents**: The health implications of microcirculatory dystonia in adolescents are profound, potentially leading to chronic fatigue, cognitive impairments, and decreased quality of life. Addressing microelement deficiencies can mitigate these risks and promote better physical and mental health outcomes.

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