


Impact of chronic stress on cardiovascular health in young women

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ABSTRACT

Chronic stress has been recognized as a significant risk factor for cardiovascular disease (CVD), especially in young women. This chapter explores the complex relationship between chronic stress and cardiovascular health, highlighting the specific vulnerabilities of young women and the implications for prevention and treatment. Current research suggests that chronic stress can affect cardiovascular health through multiple pathways, including physiological, behavioral, and psychosocial changes. Young women can be particularly susceptible due to hormonal, social, and cultural factors. Effective stress management and cardiovascular health promotion strategies are crucial to reduce the risk of CVD in this population.

Keywords: Chronic stress, Cardiovascular diseases, Young women, Cardiovascular health, Prevention.

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INTRODUCTION

Cardiovascular disease (CVD) remains the leading cause of death worldwide, affecting both men and women. Although it was traditionally believed that CVD was more prevalent in men, recent research has shown an alarming increase in CVD incidence and mortality in women, especially in younger age groups [1,2]. Chronic stress, an increasingly common condition in modern society, has been identified as a crucial risk factor for the development of CVD in young women [3].

Chronic stress can be defined as prolonged exposure to stressors such as work pressures, family problems, financial difficulties, or emotional trauma. This continuous exposure triggers a series of physiological and behavioral responses that, in the long run, can compromise cardiovascular health. In young women, factors such as hormonal fluctuations, family responsibilities, and social pressures can exacerbate the effects of chronic stress on heart health [3].

The relationship between chronic stress and cardiovascular health is complex and multifactorial. Studies have shown that chronic stress can lead to physiological changes, such as increased blood pressure, dyslipidemia, insulin resistance, and inflammation, which are well-established risk factors for CVD [4]. In addition, chronic stress can influence risky behaviors, such as smoking, excessive alcohol consumption, poor diet, and sedentary lifestyle, which also contribute to the development of CVD.

Young women may be particularly vulnerable to the effects of chronic stress on cardiovascular health due to a number of factors. Hormonal fluctuations throughout the menstrual cycle, pregnancy, and menopause can influence the stress response and increase the risk of CVD [5]. In addition, young women often face social and cultural pressures related to work, family, and motherhood, which can generate chronic stress and compromise cardiovascular health.

Awareness of the impact of chronic stress on the cardiovascular health of young women is critical for the prevention and early treatment of CVD. It is essential that health professionals, educators, and society in general are aware of the signs and symptoms of chronic stress in this population, offering support and referring them to appropriate treatment when necessary. Early diagnosis and timely intervention can significantly reduce the risk of CVD and its complications, ensuring a better quality of life for these women.

METHODS

This chapter was elaborated from a narrative review of the scientific literature on the impact of chronic stress on the cardiovascular health of young women. The search for relevant articles was carried out in the PubMed, Scopus and Web of Science databases, using the following keywords: "chronic stress", "cardiovascular diseases", "young women", "cardiovascular health" and



"prevention". Articles published in the last 10 years, in English or Portuguese, that addressed the topic directly or indirectly, were included.

The selection of articles was carried out in two stages. In the first stage, the titles and abstracts of the articles identified in the search were analyzed, excluding those that did not fit the theme or that presented low methodological quality. In the second stage, the full articles were read and critically evaluated, selecting those that provided the most robust and relevant evidence for the chapter.

RESULTS

IMPACT OF CHRONIC STRESS ON CARDIOVASCULAR HEALTH

Chronic stress triggers a cascade of physiological responses that may contribute to the development of CVD in young women. Activation of the hypothalamic-pituitary-adrenal axis leads to the release of cortisol, a stress hormone that, at chronic elevated levels, can promote hypertension, dyslipidemia, insulin resistance, and inflammation, all of which are risk factors for CVD [4, 13]. In addition, chronic stress can lead to activation of the sympathetic nervous system, resulting in increased heart rate, blood pressure, and vasoconstriction, which also contributes to cardiovascular risk [6].

RISK FACTORS AND VULNERABILITIES

Several individual, social, and cultural risk factors can increase the vulnerability of young women to chronic stress and its impacts on cardiovascular health. Individual factors include family history of CVD, traumatic childhood experiences, anxiety and depression disorders, and low self-esteem [3]. Social and cultural factors include pressures related to work, family, motherhood, and body image, as well as gender inequalities and discrimination [3, 10].

CLINICAL MANIFESTATIONS

Chronic stress can manifest itself in several ways in the cardiovascular health of young women. Hypertension is one of the main consequences, and can lead to damage to blood vessels, the heart, and other organs. Coronary artery disease, characterized by narrowing of the arteries that supply the heart, can also be triggered or aggravated by chronic stress, increasing the risk of angina, myocardial infarction, and sudden death [5]. In addition, chronic stress has been linked to other cardiovascular conditions such as cardiac arrhythmias, heart failure, and stroke [7].



PREVENTION AND TREATMENT STRATEGIES

The prevention and treatment of chronic stress and its impacts on the cardiovascular health of young women involves a multidisciplinary approach, which includes lifestyle interventions, psychological therapies and, in some cases, pharmacological treatment. Adopting a healthy lifestyle, with a balanced diet, regular physical activity, adequate sleep, and relaxation techniques such as meditation and yoga, can help reduce stress levels and improve cardiovascular health [7].

Psychological therapies, such as cognitive behavioral therapy, can be effective in managing chronic stress and preventing its negative effects on cardiovascular health. In some cases, pharmacological treatment with antidepressants or anxiolytics may be necessary to control symptoms of anxiety and depression, contributing to the reduction of cardiovascular risk.

DISCUSSION

The results of the literature reviewed in this chapter show the strong association between chronic stress and increased risk of CVD in young women. This relationship is complex and multifactorial, involving pathophysiological mechanisms, such as the activation of the hypothalamic-pituitary-adrenal axis and the sympathetic nervous system, as well as individual, social, and cultural risk factors that increase the vulnerability of young women to the effects of stress.

The clinical manifestations of chronic stress on cardiovascular health are diverse, including hypertension, coronary artery disease, cardiac arrhythmias, heart failure, and stroke. Early identification of these signs and symptoms is crucial for timely treatment and prevention of serious complications.

Effective prevention and treatment strategies must address both the physiological and psychosocial aspects of chronic stress. The adoption of a healthy lifestyle, combined with psychological therapies and, if necessary, pharmacological treatment, can contribute to reducing the risk of CVD in young women. However, it is essential that these interventions are personalized and consider the needs and particularities of each woman, including her social, cultural, and economic contexts.

In addition, it is important to highlight that the stress response can vary between individuals and that not all young women exposed to chronic stress will develop CVD. Factors such as resilience, social support, and access to healthcare resources can influence how stress affects cardiovascular health.

CONCLUSION

Chronic stress poses a significant challenge to the cardiovascular health of young women. Understanding the pathophysiological mechanisms, risk factors, and clinical manifestations of



chronic stress is essential for the development of effective prevention and treatment strategies. Awareness of this problem and early diagnosis are essential to reduce the risk of CVD and its complications, ensuring a better quality of life for this population. It is crucial for health professionals, educators, and society at large to be aware of the signs and symptoms of chronic stress in young women, offering support and referral for appropriate treatment when necessary. Early diagnosis and timely intervention can significantly reduce the risk of CVD and its complications, ensuring a better quality of life for these women.



REFERENCES

1. Benjamin, E. J., Muntner, P., Alonso, A., et al. (2019). Heart disease and stroke statistics-2019 update: A report from the American Heart Association. *Circulation, 139*, e56-e528.
2. Maas, A. H. E. M. (2019). Maintaining cardiovascular health: An approach specific to women. *Maturitas, 124*, 68-71.
3. O'Neil, A., & Russell, J. D. (2020). How does mental health impact women's heart health?. *Heart, Lung and Circulation, 29*(9), 1253-1260.
4. Penninx, B. W. (2017). Depression and cardiovascular disease: Epidemiological evidence on their linking mechanisms. *Neuroscience & Biobehavioral Reviews, 74*, 277-286.
5. Vaccarino, V., & Bremner, J. D. (2017). Behavioral, emotional, and neurobiological determinants of coronary heart disease risk in women. *Neuroscience & Biobehavioral Reviews, 74*, 297-309.
6. Jarczowski, J., Furgala, A., Winiarska, A., Kaczmarczyk, M., & Poniatowski, A. (2019). Cardiovascular response to different types of acute stress stimulations. *Folia Medica Cracoviensia, 59*(4), 95-110.
7. Reed, J. L., & Prince, S. A. (2018). Women's heart health: A focus on nurses' physical activity and sedentary behavior. *Current Opinion in Cardiology, 33*(5), 514-520.
8. Asif, I. M., Price, D. E., Ewing, A., Rao, A. L., Harmon, K. G., & Drezner, J. A. (2015). The impact of diagnosis: Measuring the psychological response to being diagnosed with serious or potentially lethal cardiac disease in young competitive athletes. *British Journal of Sports Medicine, 49*(24), 1575-1579.
9. Pierce, J. B., Kershaw, K. N., Kiefe, C. I., Jacobs Jr, D. R., Sidney, S., Merkin, S. S., & Feinglass, J. (2020). Association of childhood psychosocial environment with 30-year cardiovascular disease incidence and mortality in middle age. *Journal of the American Heart Association, 9*(7), e015326.
10. Gooding, H. C., Brown, C. A., Revette, A. C., Vaccarino, V., Liu, J., Patterson, S., ... & de Ferranti, S. D. (2020). Young women's perceptions of heart disease risk. *Journal of Adolescent Health, 67*(1), 3-6.
11. Taylor, S. E., Lehman, B. J., Kiefe, C. I., & Seeman, T. E. (2006). Relationship of early life stress and psychological functioning to adult C-reactive protein in the Coronary Artery Risk Development in Young Adults study. *Biological Psychiatry, 60*, 819-824.
12. Mehta, L. S. (2011). Cardiovascular disease and depression in women. *Heart Failure Clinics, 7*(1), 39-45.
13. Yazawa, A., Inoue, Y., Tu, R., Yamamoto, T., Watanabe, C., & Kawachi, I. (2020). Chronic stress and age-related pattern of blood pressure: A cross-sectional study in rural China. *American Journal of Human Biology, 32*(e23449). <https://doi.org/10.1002/ajhb.23449>