The Impacts of Adverse Childhood Experiences on Cardiovascular Health in Adults

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ABSTRACT:

Background

While most cardiovascular disease prevention revolves around adult lifestyle factors, early childhood adversities (such as neglect, abuse, and household instability) significantly impact long term heart health in adults. This narrative review evaluates how Adverse Childhood Experiences can impact adult cardiovascular risks, by looking at physiological factors, as well as behavioral factors.

Methods

A search on PubMed found 8 studies from 2016-2026, which assessed childhood trauma and the impact on adult cardiovascular outcomes. Studies were included if they evaluated the impact of stress or trauma that occurred before the age of 18 on adult cardiovascular outcomes. Studies were excluded if they focused only on adult stress or non physical mental health outcomes.

Results

Childhood trauma has a strong correlation with adult cardiovascular disease, accounting for all the standard risk factors like smoking, alcohol use, and diabetes. Early childhood adversities increase the risk of coping behaviors like tobacco use and are associated with an increased risk of cardiovascular diseases.

Discussion

The findings highlight how heart disease risk can begin in early childhood, through physiological and behavioral pathways. Despite the limitations of this study, of recall bias and difficulty isolating a population, this study remains valid. Healthcare systems should make trauma oriented healthcare a part of standard care, which can help decrease the morbidity rate of cardiovascular diseases.

INTRODUCTION:

Cardiovascular diseases (CVDs) remain one of the leading causes of morbidity and illness, accountable for almost 18 million deaths around the world [1]. While most clinical studies focus on adult lifestyle factors, such as smoking, drinking, unhealthy diets, and lack of exercise, more researchers have begun shifting their focus to the impacts of early life experiences, and its correlation with risks of CVDs. These diseases' foundations often start as early as childhood,

accelerated by Adverse Childhood Experiences (ACEs) such as childhood trauma, severe abuse, neglect, or mistreatment [2]. These stressors occur during sensitive developmental periods, when a child is growing up, and through neurological development. This changes their body's physiologies well into their adulthood, significantly changing their risks of CVDs [2,3].

Around two thirds of the adult population in the USA has been exposed to at least one of the three categories of ACEs (physical abuse, emotional neglect, or a dysfunctional household) [4]. To understand the impacts of this overwhelming statistics, and how it translates to increase in CVD risks, researchers turned their focus to the biological link between childhood stress and cardiovascular health, which are cardiometabolic markers. These markers are indicators of cardiovascular and metabolic health, and are measured by multiple factors, such as lipids, or cholesterol and triglycerides, blood glucose levels, and inflammation [2,3]. The inflammation is caused by the C-reactive protein (CRP), and it causes chronic, low grade inflammation, which is a significant cardiometabolic indicator [3]. Before the human body immediately jumps to myocardial infarction, the body goes through a slow process where a change in cholesterol levels, higher blood glucose, and higher inflammatory markers chip away at the heart's health, slowly damaging the body's cardiovascular system over time [2]. Although with modern technology we have found the link between ACEs and CVD risks, which are cardiometabolic markers, we still lack a clear understanding of which biological markers bridge the gap between the two.

To get a better understanding of the correlation between childhood stressors and cardiovascular impacts this study answers this research question: what is the relationship between ACEs and cardiovascular health in adults? To answer this question, this paper addresses the link between the two, researching the impacts of cardiometabolic markers, and how psychological stress from childhood can turn into actual physiological damage to the vascular system in the future. By researching these problems, this review aims to take a glance into how the healthcare system can reorient themselves into being more proactive into childhood trauma, especially because so many children go through at least one form of an ACE. Ultimately, if the healthcare system can help reduce the amount of children going through severe neglect, or traumatic events, that can be a step forward to reducing the morbidity rate of cardiovascular diseases in adults.

METHODS:

This study is a narrative review of five articles. All information was found on the PubMed database. Studies were included if they directly addressed the relationship between early childhood stress (such as ACEs, trauma, neglect, and growing up in poverty) and experiences with cardiovascular health risks or cardiovascular diseases (CVDs) (including coronary heart disease, hypertension, or strokes) in older adults. Articles considered had to be original studies, published in English, and published within the last ten years (July 2016 through July 2026). The studies should also be focused on stress that occurred before the age of 18, and had cardiovascular risks or diseases after the age of 18, later in adulthood. Articles that were

excluded were those that do not measure physical outcomes of childhood stress, like cardiovascular health, and only measure outcomes such as mental stress, depression, or anxiety. Studies that only looked at adult stress instead of childhood stress were also not included. The key search terms used were: ("Adverse Childhood Experiences" OR "childhood trauma" OR "early life adversity") AND ("cardiovascular disease" OR "coronary heart disease" OR "stroke"), and ("childhood poverty" OR "socioeconomic status") AND "cardiovascular risk factors" AND "adulthood".

RESULTS:

Direct Association Between CVD Risk and ACE Exposure

The data examining middle-aged and older adults showed a strong correlation between early childhood stress and cardiovascular diseases that occurred in adulthood [5]. This association remained significant even after accounting for common adult risk factors, including smoking tobacco, consuming alcohol, and comorbidities, such as diabetes.

A nationwide register-based cohort study came up with similar results, including over 1.2 million participants in Denmark, who determined the significance of the impacts that severe family related childhood trauma had on adults [6]. The study found that exposure to severe childhood trauma, more specifically either experiencing the illness or death of a family member, was associated with higher risks of CVD developments in their early adulthood when compared to those who did not have to come through such adversities.

Combined Effects of ACEs and Mental Health Outcomes

Data from over 70,000 U.S. adults tracked the link between early childhood adversities, depression, and cardiovascular health [7]. The study found that adults diagnosed with depression, who went through childhood trauma or adversities, were nearly 2 times more likely to develop a form of CVD when compared to a person who did not have exposure to ACEs [7].

Behavioral and Physical Outcomes of ACEs

In a sample of U.S. adults, data demonstrated that cumulative childhood stress, like growing up in poverty, abuse, or instability, is closely linked to the key drivers of CVDs in adulthood [8]. Adults who reported multiple types of childhood adversity had nearly double the rate of tobacco smoking (45.0%) when compared to those who had low to none adversity (24.0%) [8].

High childhood trauma was also associated with increased lipid abnormalities, such as elevated cholesterol (26.3% vs 19.1%), and elevated triglycerides (13.0% vs. 7.8%) [3]. Research also showed direct correlation between trauma occurring before the age of 18, and altered adult cardiometabolic markers [3].

DISCUSSION:

Summary of Key Findings

This narrative review assessed the impacts that ACEs have on cardiovascular health in adults. Overall, the studies and articles reviewed showed a strong relationship between childhood adversity (including childhood abuse, neglect, and household instability) and higher risks of developing cardiovascular diseases (CVDs) later on in their adulthoods. Particularly, research found that people who were exposed to early childhood trauma directly lead to higher chance of CVD [5,6], behaviorally through leading to common risk factors of CVDs (such as smoking or alcohol use) and physically as well, through cardiometabolic markers, which showed abnormalities in lipids and inflammation [3,8]. Mental health issues, more specifically depression, also significantly increased the risk of CVDs [7].

Research Interpretations

When severe childhood trauma or stress occurs early in life, it leaves a lasting impact, not just mentally, but also biologically, as it significantly increases the risk of CVDs in the future, even after accounting for other risks, including diabetes, smoking, and alcohol use [5,6]. This heightened risk presents itself both behaviorally, and physically. Trauma often ends up leading to unhealthy coping mechanisms, with adults exposed to these early traumas smoking almost double the amount of their peers who have not gone through as much trauma [8]. Simultaneously, early ACEs directly impacts cardiometabolic markers before there is any indication that a CVD is developing, by increasing cholesterol and triglyceride levels [3]. And on top of this, adding adult mental health struggles, such as depression, further strains the vascular system, and almost doubles the disease risk compared to those without childhood trauma [7].

Research Implications

This research highlights the need to further expand and research about adult cardiovascular health beyond just the standard clinical risks and metrics, like diet, and activity. Because early life trauma directly changes long term CVD risk [3], and it accelerates unhealthy coping mechanisms like smoking [8], adult cardiovascular health should be seen through a new perspective, taking into consideration trauma and life experiences [1]. Understanding that ACEs have a direct correlation to adult heart health and risky coping behaviors should change how healthcare perceives trauma, and how they can orient their care around those who underwent severe childhood trauma [7]. Recognizing how trauma can present itself, through markers and negative behavioral habits, can help create preventative care, and reduce the risk of CVD.

Study Limitations

While this study has valuable interpretations, the study limitations should also be considered. Most original studies often rely on participants self reporting their childhood traumas, or retrospective self reports, and these can lead to recall bias, where they do not remember everything accurately [8]. Also, specifically isolating direct biological effects from other social

determinants is difficult in a large set of people in observational research [5]. Despite these limitations, this research is still valid due to the consistency across several research studies, especially with some that have over 1 million participants [6,7].

Recommendations

To address the long term impacts of early life adversities on heart health in adults, healthcare systems should make trauma informed care a part of their standard care [7]. Primary care providers should also adopt trauma informed protocols, such as ways to address the combined risks of CVDs and mental health conditions after childhood trauma. Also, scientifically, more research is needed to find which specific cardiometabolic markers from early childhood impact CVD risks in adulthood [3]. Research should also be done on whether stress management interventions can improve the risks of CVD among early trauma exposed adults, and also to lower the general adult cardiovascular morbidity rate.

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