DOI: 10.7860/JCDR/2026/88435.22860 Abstract No.: 14

Effects of ACSM-Recommended Exercise Interventions on Aerobic Capacity in Patients with Stage-2 Hypertension: A Systematic Review

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ABSTRACT

Introduction: Hypertension remains a major global public health concern, contributing significantly to cardiovascular diseases. While pharmacological therapy is fundamental for blood pressure control, exercise-based interventions have emerged as a crucial non-pharmacological strategy to enhance the cardiovascular function and overall health outcomes. The American College of Sports Medicine (ACSM) provides comprehensive, evidence-based guidelines that advocate for regular moderate to vigorous intensity aerobic activities, such as brisk walking, cycling, or swimming, performed on most days of the week to achieve optimal blood pressure regulation and cardiovascular benefits. This systematic review aims to critically study the efficacy of the ACSM-recommended aerobic training protocols in patients with Stage-2 hypertension, with particular emphasis on their impact on aerobic capacity as measured by maximal oxygen uptake (VO2 max) and the Six-Minute Walk Test (6MWT). By synthesising findings from recent clinical trials and exercise interventions, this review seeks to provide an evidence-based understanding of how structured aerobic exercise, aligned with ACSM-based guidelines contribute to improved cardiovascular fitness and functional capacity in hypertensive populations.

Aim: This systematic review aims to analyse the effects of ACSM-recommended exercise interventions on aerobic capacity in patients with stage-2 hypertension. The study specifically focuses on the change in aerobic capacity, as quantified by measures such as VO2 max and the 6MWT.

Materials and Methods: A systematic review was conducted across PubMed, Scopus, ScienceDirect, Google Scholar for research articles published from 2013 to 2024. This systematic review includes 18 clinical trials and longitudinal cohort studies that assessed the effects of ACSM-based aerobic therapies on aerobic capacity in stage-2 hypertensive patients, analysing the intervention parameters and outcomes.

Results: Most trials in this systematic review reported significant improvements in aerobic capacity among stage 2 hypertension patients following ACSM-based exercise protocols. On average, VO2 max increased by 10-18%, with aerobic training performed 3-5 times per week for 30-60 minutes, yielding the most consistent gains. These interventions also improved 6MWT performance and reduced resting blood pressure, reflecting enhanced cardiovascular efficiency. Additionally, supervised High-Intensity Interval Training (HIIT) programmes produced comparable or even greater improvements in aerobic capacity, emphasising the adaptability and effectiveness of ACSM-guided exercise prescriptions for hypertensive individuals.

Conclusion: Aerobic training based on ACSM guidelines significantly enhances aerobic capacity in individuals with stage-2 hypertension, contributing to improved cardiovascular health and a more favorable prognosis, as reflected by increased VO2 max and endurance levels. Achieving optimal outcomes depends on an individualised programme design, consistent participation, and sustained adherence. Future research should emphasise the standardised implementation of ACSM principles and investigate long-term adherence and outcomes within this population.

Keywords: ACSM-Based Guidelines, Cardiovascular health, Six-minute walk test

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