

Orthopedic problems: An underestimated hidden risk factor for development and progression of atherosclerosis; An inconspicuous joint link

Mohaddeseh Behjati⁽¹⁾

Editorial

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Introduction

Regular leisure time and occupational physical activity exerts beneficial effects on cardiovascular health.¹ Healthy life style and physical activity behaviors diminish overall rate of coronary artery disease (CAD) among both female and male gender.² Favorable effects of physical activity have been proven concerning cardiovascular disease (CVD) morbidity and mortality.³ It improves cardiovascular function and compliance. Even modest physical activity minimizes the risk of CVD occurrence.⁴

Regular exercise impacts numerous health benefits in older people including improvement in blood pressure, osteoarthritis, osteoporosis, diabetes mellitus, lipid profile, CVD, neurocognition function, mood and overall morbidity and mortality.³ Physical activity has beneficial dose-dependent effects on blood pressure via reaching a plateau level.⁵ Cardioprotective effects of life-long physical activity and endurance exercise against cardiac insults are well-elucidated in both young and old age population.⁶ Beneficial impacts of physical activity occur at various cellular organizations as mitochondria. Regular physical activity accompanies with cessation of cigarette smoking, decreased consumption of saturated fatty acids, reaching and maintenance of ideal body weight and decreased stress level which are all involved in achievement of cardiovascular health.⁶

Our ancestors were obligated to exert higher levels of physical activity in order to survive and that partly explains lower prevalence of this human-made disease in ancient nations. Modern life brought enhanced sitting time by facilitating achievement of daily requirements. Voluntary

physical inactivation is a threat for majority of population, but by increasing the percentage of old age population, the ratio of people with involuntary physical inactivity will enhance dramatically. Physical activity behaviors might exist but converting it into action needs proper functioning of neuromusculoskeletal system. Therefore, this unintentional physical inactivity prohibits deriving cardiovascular benefits from physical activity. Thus, the aim of this article is to scheme an overview on inconspicuous link between orthopedic problems and CVD.

Orthopedic disorders bring great limitation for accomplishment of regular physical activity both in young and old people. Orthopedic problems are predisposing factors for lack of proper physical activity and alarming increase in sedentary habits. Considering the established association between physical activity and cardiovascular health, hints towards regular physical activity renders provocation of development and progression of atherosclerosis. Primarily, orthopedic insufficiency might prevent access to therapeutic pills and other therapeutic interventions. Thus, poor adherence and non-adherence to medical advises as effort to attend in follow-up sessions is another side of the coin. Depression related to impaired locomotion is also contributing to the progression of CVD.⁷

Since some of orthopedic disorders occur in the setting of underlying inflammatory conditions, the underlying inflammatory background bridges the gap between healthy and unhealthy cardiovascular system.⁸ The delicate inter-relationship between vitamin D on both CVD and vitamin-D-deficiency-related bone disorders are also proposed. Heart failure is

1- Isfahan Cardiovascular Research Center, Cardiovascular Research Institute, Isfahan University of Medical Sciences, Isfahan, Iran
Correspondence to: Mohaddeseh Behjati, Email: behjati@med.mui.ac.ir

considered as an increased risk factor for development of subsequent orthopedic bone fracture.⁹

This is not the whole story. Orthopedic disorders are associated with CVDs in other ways. Some side effects of orthopedic problems are the leading causes of CVD, as occurrence of venous thromboembolism (VTE) after orthopedic surgeries or bed rest. Indeed, adverse side effects of applied medications as non-steroid anti-inflammatory drugs (NSAIDs) and corticosteroids on cardiovascular system health should not be neglected. Figure 1 is schematic view for demonstration of links between orthopedic disorders and cardiovascular diseases.

Obviously, this could not be a primary risk factor for CVD. Since orthopedic disorders are mainly happening in old age as the same with CVD, these orthopedic problems could be considered as risk factor or even co-risk factors for development and progression of CVD. In better

word, orthopedic problems could be considered as a secondary or tertiary risk factor for the onset and follow up of CAD. In brief, the current state of orthopedic disorders as secondary or tertiary risk factor for CVD is not definite due to the lack of clinical trials in this regard. Involuntary physical inactivity is not merely related to orthopedic problems, but each condition which compromise bodily locomotion should be considered as a risk factor for CVD. Considering this hidden risk factor, physicians should try to dampen the negative effects of this negative risk factor. But practically, the general advice of "having moderate intensity amounts of regular physical activity as walking through the park, running or cycling" should be avoided. The type of physical interventions should be personalized and physicians should advocate patients to find practical exercise prescription per case.

Conflict of Interests

Authors have no conflict of interests.

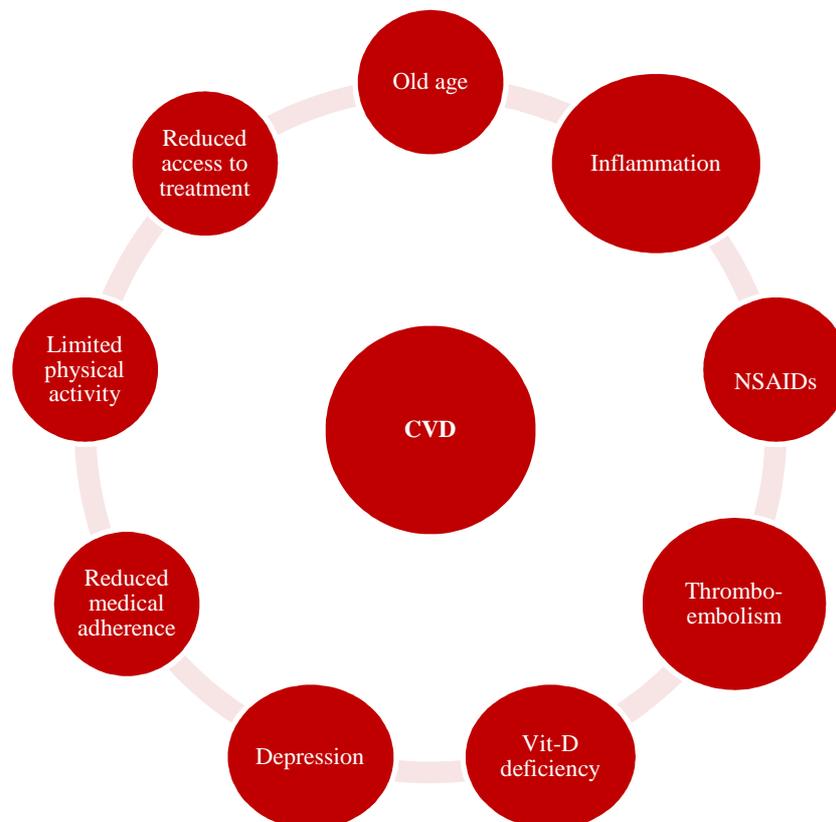


Figure 1. The schematic view for demonstration of links between orthopedic disorders and cardiovascular diseases (CVD)
NSAIDs: Non-steroid anti-inflammatory drugs

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