

Links between low physical activity and vitamin D deficiency on coronary artery disease in patients undergoing coronary angiography

Abstract

Low physical activity and vitamin D deficiency are two risk factors in public health burdens accounting for most coronary artery disease (CAD) morbidity and mortality worldwide. The prevalence of CAD is increasing in the both men and women. Since the effect of physical activity and vitamin D on number of involved vessels in patients undergoing coronary angiography are unknown, studies needs to be done to combat this public health scourge.

Keywords: Physical Activity, Vitamin D, Coronary Artery Disease

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Introduction

Cardiac accidents due to coronary artery disease are the most common cause of mortality in the world.^{1,2} On the other hand, low physical activity and vitamin D deficiency are known as an emerging risk factor of this disease.^{3,4} Vitamin D deficiency is highly prevalent; approximately 25%–57% of the US population² and more than 1 billion persons worldwide;^{5,6} Also, the benefits of physical activity in the prevention and treatment of CAD have been very well described in adults.⁶ Considering the high prevalence of decrease physical activity and vitamin D deficiency in Iran we investigated the prevalence of vitamin D deficiency in angioplasty patients, effect of physical activity and its relationship with coronary artery disease.

Materials and methods

In this cross-sectional study two-hundred patients undergoing coronary angiography (men; n=100 with mean age 45.3±6.3 years and women; n=100 with mean age 43.6±4.2 years) were selected using the clustering method for sampling. Subjects completed an informed consent form, health history questionnaire and physical activity questionnaire (Baecke) and serum level of 25(OH) D3 was measured. Patients with renal failure (Cr > 2mg/dl), liver disease, and those treated with glucocorticoids or anti-epileptic drugs were excluded. For data analysis, inferential statistics of Kolmogorov-Smirnov and Pearson correlation coefficient were used.

Results

Physical activity levels were low (men 62.4% and women 68.5%) or insufficient (men 37.6% and women 31.5%); Also, prevalence of vitamin D deficiency was 82.3% (men 68.2% and women 81.5%). Low physical activity level and vitamin D deficiency were related to the number of involved vessels in subjects ($r=0.78$, $P=0.001$ and $r=0.65$, $P=0.021$ respectively). The pattern effect of low physical activity and vitamin D deficiency on coronary artery disease seems not to be different in men and women.

Conclusion

Maintaining an optimal physical activity and vitamin D serum level seems important not only for calcium homeostasis but also for blood pressure control, prevalence of stroke, metabolic syndrome, peripheral artery disease and CAD. Observational data support the link between physical activity and vitamin D status and CAD, and decrees physical activity and vitamin D deficiency can be considered a CAD risk marker.^{3,4} Physical activity and vitamin D exert their cardiovascular effects by reducing the activity of the reninangiotensin-aldosterone system,⁷ lowering blood pressure values,⁸ and having an anti-inflammatory,⁹ antiproliferative, antihypertrophic and antithrombotic effect¹⁰ and beneficial modulation of classical cardiovascular risk factors. The mentioned effects might be very important for public health, considering the high prevalence of vitamin D deficiency and low physical activity, the aging population, and the indoor oriented lifestyle. Complementary studies are needed to elucidate this issue further.

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