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Letter to Editor

# Evaluation of vitamin D effects and relationships with partial thromboplastin time in patients with acute coronary syndrome

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**Dear Editor**

The investigations about the association between coronary artery disease (CAD) and vitamin D deficiency are insufficient yet because there are paradoxical findings in several investigations; however, some of them have demonstrated this relationship between vitamin D deficiency and myocardial infarction (MI), heart failure and peripheral vascular disease.[1-3] Although various evaluations were performed about such relationship, the effects of deficiency on the results of angioplasty have not had clear results, yet.[4]

The CAD is one of the most important reasons of mortality in the worldwide which is related with different factors such as vitamin D deficiency. It seems that its deficiency could be related to CAD is responsible for the most common factor of death in worldwide.[5,6] The World Health Organization (WHO) defines the vitamin D insufficiency as serum levels lower than 20 ng/mL (nmol/L)[4], but more recently, the other investigators began to refer vitamin D deficiency as serum 25-OHD level < 20 ng/mL and vitamin D insufficiency as less than 30 ng/mL (75 nmol/L).[7] Its incidence is a global health problem with reported prevalence about 96% of patients with CAD.[5,6,8,9,10] The Vitamin D influences inflammation and cell proliferation as well as hemostasis hormones; and so, it plays modulatory role in the immune system.[1,5-9] The proposed mechanisms of the antithrombotic effect of vitamin D include the up-regulation of thrombomodulin, and down-regulation of tissue factor. In addition, it up-regulates and increases IL-10 level that improves vascular endothelial function.[2,3] The vitamin production pathway in human's skin by ultraviolet exposure is a chief way which the several factors such as the latitude, seasons, age, sun exposure, and the climate can impact on its production.[2]

Currently, the level of vitamin D has been declining in both genders due to the inappropriate diet and less sun exposure.[2,11] It is suggested as potential anti-inflammatory and anti-thrombotic mediator.[10,12] On the other hand, this issue is associated with high platelet activities, impaired antagonist activity of adenosine di-phosphate (ADP), and the lack of platelet aggregation through ADP in patients with CAD.[12] These items are remarkable in high-risk cases with CAD, especially in patients undergoing for interventions such as percutaneous coronary intervention for resolving the case.[13] In addition, inadequate inhibition of platelet has relationship with procedural complications, for instance, pre-procedural MI, the acute thrombotic events of stent and enhanced amount of ischemic occurrences in prolonged time.[14] However, in a large Danish cohort of 10 170 people with a mean follow-up period of 21 years, the authors showed a stepwise increased risk of MI, hypertension and death with lower levels of vitamin D.[15] It has anti-hypertrophic and suppressive effects on the renin- angiotensin system and prevents vascular calcification. Furthermore, the number of occluded vessels, hospitalization days, echocardiography evaluation, EF <35%, the average number of applied stents were much more in cases who affected by vitamin deficiency in comparison with normal persons.[15] Indeed, this issue which is associated with the higher risk of lower platelet is described in literature and it can be as risk factor of sudden cardiac death.[16-18] Although various studies have been conducted about this possibly association, they could not had clear results, yet. For example, Kendrick J et al. showed that 425 (15%) patients suffered from atrial fibrillation while following the patients during 9.9 years. Finally, they found that vitamin deficiency could not influence the occurrence of atrial fibrillation.[7,19,20] We concluded for providing definite theory about this relationship, further evaluations on large

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populations will be required.

**Authors' contributions**

HB and NAA: Selection title. HB, NAA and AA: Designing of the study. HB, NAA and SZS: Setting up the questionnaire. AA and AS: Sampling. AA: Performing the statistical analysis. HB, NAA and AS: Interpreting the data. HB, NAA and SZS: Taking ethical code. AA: Following up patient test results. HB, AA, SZS and AA: Editing the study. All contributors assessed and approved the final article.

**Conflict of Interest**

The authors state that they have no conflict of interests.

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**Ethical Approval**

Not applicable.

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