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.\(^3\)\(^4\) 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), 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.\(^3\)\(^5\)\(^6\)\(^8\)\(^9\)\(^10\)\(^11\) The Vitamin D influences inflammation and cell proliferation as well as hemostasis hormones; and so, it plays modulatory role in the immune system.\(^1\)\(^2\)\(^3\)

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
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.

Acknowledgments
We would like to thank staffs of Heart Shahid Madani Hospital, Cardiovascular Research Center and Liver and Gastrointestinal Disease Research Center of Tabriz University of Medical Sciences in Tabriz/Iran because of collaboration in the advancing this study.

Ethical Approval
Not applicable.

Funding
Not applicable.

The authors state that they have no funding support.

References


