Journal of Geriatric Cardiology (2016) 13: 643–644

Correspondence · **Open Access** ·

Postoperative atrial fibrillation and vitamin D

Levent Cerit

Department of Cardiology, Near East University, Nicosia, Cyprus. E-mail: drcerit@hotmail.com

J Geriatr Cardiol 2016; 13: 643–644. doi:10.11909/j.issn.1671-5411.2016.07.007

Keywords: Atrial fibrillation; Coronary artery bypass graft; Vitamin D

To the Editor

I have read the article entitled "Predictors of new-onset atrial fibrillation in elderly patients with coronary artery disease after coronary artery bypass graft" by Anatol´evna, *et al*.[1] with great interest. The investigators reported that independent predictors of postoperative atrial fibrillation (POAF) after coronary artery bypass graft (CABG) in elderly patients were left atrium dimension (LA) and the increased postoperative concentration of Interleukin (IL)-6, IL-8 and superoxide dismutase.[1]

Development of atrial fibrillation (AF) after cardiac surgery is associated with increased morbidity, mortality, longer hospital stay and it is associated with a twofold to threefold increase in postoperative stroke. Older age, obesity, hypertension, prior AF and congestive heart failure associated with higher risk of developing AF after cardiac surgery.[2]

Vitamin D is transformed in the liver and kidney to calcidiol and calcitriol, respectively, and effects specific target tissues via vitamin D receptors (VDR). VDR are found in other tissues, including the brain, cardiomyocytes, vascular smooth muscle cells, endothelial cells, pancreatic beta-cells, skeletal muscle, prostate, colon, macrophages.[3]

There was a strong relationship between vitamin D deficiency and AF. The role of vitamin D deficiency in the onset of AF was suggested because of several potential mechanisms described previously. Vitamin D regulates inflammatory responses and up-regulates the expression of anti-inflammatory cytokines such as IL-10 according to in-vitro experiments.[4] Also, vitamin D regulates renin-angiotensin-aldosterone system (RAAS) activity. Activated RAAS can lead to oxidative stress and inflammation, both of which can culminate in AF. It is assumed that tissue angiotensin II can induce apoptosis of cardiomyocytes and can contribute to changes in atrial structure.[5]

In the light of these knowledges, patients' vitamin D level should be mentioned, and also discussed relationship between vitamin D level and POAF.

References

1 Anatol´evna RO, Veniaminovich FO, Mikhaylovich KS. Predictors of new-onset atrial fibrillation in elderly patients with coronary artery disease after coronary artery bypass graft. *J Geriatr Cardiol* 2016; 13: 444–449.
2 Amar D, Shi W, Hogue CW, *et al*. Clinical prediction rule for atrial fibrillation after coronary artery bypass grafting. *J Am Coll Cardiol* 2004; 44: 1248–1253.
3 Dusso AS, Brown AJ, Slatopolsky E, Vitamin D. *Am J Physiol Renal Physiol* 2005; 289: 8–28.
4 Canning MO, Grotenhuis K, de Wit H, *et al*. 1-alpha,25-Dihydroxyvitamin D3 (1,25(OH)(2)D(3)) hampers the maturation of fully active immature dendritic cells from monocytes. *Eur J Endocrinol* 2001; 145: 351–357.
5 Frustaci A, Chimenti C, Bellocci F, *et al*. Histological substrate of atrial biopsies in patients with lone atrial fibrillation. *Circulation* 1997; 96: 1180–1184.

Authors' reply

Rubanenko O Anatol´evna[1,2]

[1]*Department of Faculty Therapy, Samara State Medical University, Samara, Russia*
[2]*Samara Regional Cardiology Centre, Samara, Russia*

We would like to thank you for Dr. Cerit's excellent comments. We agree that vitamin D could play the role in development of AF after CABG. However, it wasn't the aim of our study to estimate it and that's why we couldn't provide information about vitamin D levels in our patients.

There are controversial data in literature about the influ-

ence of vitamin D on development of postoperative AF. Vitamin D is considered to be a modulator of inflammatory cells and inflammatory cytokine secretion, and also low vitamin D status may contribute to chronic inflammatory conditions.[1] Zittermann, *et al*.[2] revealed that a high prevalence of vitamin D deficiency in cardiac surgical patients was associated with a twofold higher risk of major adverse cardiac and cerebrovascular events after surgery.

On the other side, Skuladottir, *et al*.[3] studied the metabolites, 25(OH)D2 and 25(OH)D3, which provide a good index of vitamin D status. They showed that higher plasma levels of 25(OH)D2 are associated with increased risk of POAF, while this is not the case for 25(OH)D3 or total 25(OH)D. The author considered that the reason for these discrepant results is not clear but warrants further study.

References

1 Nagpal S, Na S, Rathnachalam R. Noncalcemic actions of vitamin D receptor ligands. *Endocr Rev* 2005; 26: 662–687.
2 Zittermann A, Kuhn J, Dreier J, *et al*. Vitamin D status and the risk of major adverse cardiac and cerebrovascular events in cardiac surgery. *Eur Heart J* 2013; 34: 1358–1364.
3 Skuladottir GV, Cohen A, Arnar DO, *et al*. Plasma 25-hydroxyvitamin D2 and D3 levels and incidence of postoperative atrial fibrillation. *J Nutr Sci*. Published Online First: 2016 Feb 15. doi: 10.1017/jns.2015.38.