Letter to the Editor
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Low Serum Vitamin D Levels and Post-Operative Outcomes

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Vitamin D (25-hydroxyvitamin D) deficiency is defined as <25 nmol/L or <10 ng/mL whereas insufficiency is 25–75 nmol/L or 10–30 ng/mL. Vitamin D deficiency is a common and ever-increasing health problem that approximately affects over one billion people worldwide probably due to the 21st century lifestyle since we are not getting as much sun exposure as we used to [1]. In the USA about 25 million adults are diagnosed with Vitamin D deficiency [2].

Vitamin D is known for numerous critical functions in human body and it's main role is to sustain calcium and phosphate homeostasis, and to promote bone mineralization. However, lately many major roles of vitamin D have been recognized. Researchers found that vitamin D has significant impact on immune system function and essentially regulates pro-inflammatory pathways and cytokines which play vital role in the disease of several organ systems [3]. Recent data suggests that vitamin D deficiency or insufficiency status has been associated with pathogenesis of several diseases for example hypertension, type 2 diabetes mellitus, cancer, infections, and cardio-cerebrovascular disease [4, 5]. Particularly during postoperative period, patients are vulnerable to serious infections and cardiovascular complications. Underlying mechanism shows that combination of vitamin D deficiency (common in patients undergoing surgery) and surgery appear to worsen the postoperative complications. Despite the high prevalence of hypovitaminosis D in this particular population and substantial deteriorating of many outcomes with vitamin D deficiency, there is a paucity of data in the literature focusing on surgical population.

Recently, we published a large-scale retrospective cohort analysis of 3509 adult patients who had non-cardiac related surgery in our hospital between 2005 and 2011 [1]. The aim was to determine the relationship between serum vitamin D level and all of the causes in-hospital cardiovascular morbidity, and serious infections. Results showed that higher serum vitamin D levels were associated with decreased odds of in-hospital mortality or morbidity ($P = 0.003$) [1]. Furthermore, analysis showed that there was a linear reduction of severe in-hospital outcomes for each 5 ng/mL increase in vitamin D level over the range between 4 ng/mL and 44 ng/mL [1]. It is concluded that serum vitamin D levels were associated with a composite of in-hospital death, cardiovascular events and serious infections [1].

Historically, patients are always concerned about complications of anesthesia and surgery. Nowadays, anesthesia and surgery are safer and there is tremendous improvement in perioperative patient care. However, as healthcare the goal is to increase patient satisfaction and care, along with reducing postsurgical adverse outcomes to the minimum level. Worldwide, more than 234 million patients undergo major surgeries annually and most of them have vitamin D deficiency or insufficiency. Preoperatively, increasing the vitamin D level to the optimal concentration may decrease postoperative adverse outcomes and serious complica-

tions. Therefore, further well-designed large scale clinical trials are desired to determine the effect of vitamin D in patients undergoing surgery.

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