Abstract

Numerous studies have shown that vitamin D plays a significant role in the inflammatory process. Obesity is a well-known risk factor for thromboembolic diseases and a condition leading to vitamin D deficiency. Furthermore, orthopedic conditions are associated with an increased risk of thrombosis, endothelial dysfunction, and inflammation. The aim of this study was to assess whether vitamin D supplementation in patients with acute (AOCs) and chronic (COCs) orthopedic conditions and comorbid obesity could affect hemostasis parameters, endothelial function, and inflammation. Thirty-three obese patients diagnosed with AOCs or COCs were enrolled in the study. Patients received vitamin D at a dose of 4000 IU/day for three months. An enzyme-linked immunosorbent assay (ELISA) was used to measure serum concentrations of alpha 2-antiplasmin (α2AP), vascular cell adhesion molecule 1 (VCAM-1), plasminogen activator inhibitor-1 (PAI-1), tissue factor pathway inhibitor (TFPI), chitinase-3-like protein 1 (YKL-40), interleukin 6 (IL-6), interleukin 17 (IL-17), tumor necrosis factor (TNF-α), adiponectin, and vitamin D. Concentrations were determined at two time points – before and after a three-month supplementation. Regardless of the increase in serum vitamin D concentration, a statistically significant change in VCAM-1, PAI-1, and IL-17 concentrations was observed in the group of patients with AOCs. However, in patients diagnosed with COCs, significant changes were demonstrated for VCAM-1, IL-6, and TNF-α. The study did not show that three-month supplementation with vitamin D at a dose of 4000 IU/day reduced inflammation in this group of patients.

Keywords: inflammatory process; obesity; coagulation; endothelial function; orthopedic conditions; vitamin D.