



## Obesity, Bariatric Surgery and Vitamin D

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### Editorial

The high prevalence of obesity is a worldwide problem associated with multiple comorbidities, including cardiovascular diseases. Vitamin D deficiency with Secondary Hyperparathyroidism (SHPT) is common in obese individuals and can be aggravated after bariatric surgery. Moreover, there is no consensus on the optimal supplementation dose of vitamin D in post-bariatric surgical patients. We presented new data on the variability of 25 (OH) D responses to supplementation in postmenopausal obese women [1]. This is a “hot topic” As a speaker and author my paper on this topic received the greatest feedback of my career. It is important to recognize and treat vitamin D deficiency before bariatric surgery to avoid postoperative complications, such as metabolic bone disease with associated high fracture risk. The objective of this article is to discuss the bone metabolism consequences of vitamin D deficiency after bariatric surgery. Prospect observational studies demonstrated a 96% rate of vitamin D deficiency in morbidly obese French patients [2]. Data that showed vitamin D deficiency in 96% (25-OH vitamin D =  $31 \pm 13$  nmol/l), with a cut-point of 50 nmol/l. Secondary hyperparathyroidism was found in 44% of patients with hypovitaminosis D (parathyroid hormone (PTH),  $59 \pm 24$  pg/ml). Impaired PTH level concerned 89% of this group, considering the cut-point at 30 pg/ml. These numbers are the approximately worldwide. The high prevalence of obesity is a worldwide issue, mainly because of its association with several chronic conditions. It emerges as a result of the complex synergy of genetic, lifestyle and metabolic aspects and is defined as a body mass index (BMI)  $\geq 30$  kg/m [3-5]. The prevalence of obesity in adults in the United States (US) between 2007 to 2012 was 35% among men and 37% among women [4]. The prevalence of obesity has increased worldwide affecting the US, Europe, and developing countries and troubled even the world’s poorest nations [4]. Data from 2014 showed that the Brazilian population is gaining weight, 16.8% of the population is obese and 52.5% is overweight [6]. Fat distribution influences the obesity-related risk. Specifically, abdominal adiposity is associated with an increased risk of metabolic syndrome, a group of multiple cardiovascular risk factors, including hypertension, diabetes or impaired glucose tolerance, increased abdominal circumference, and dyslipidemia [5,7]. Obese individuals may also develop other chronic diseases, for instance, Obstructive Sleep Apnea Syndrome (OSAS), Nonalcoholic Fatty Liver Disease (NAFLD), gout, Polycystic Ovary Syndrome (PCOS), certain types of cancer, hypogonadism, musculoskeletal disease including increased fracture risk and psychological diseases [8]. Weight loss can be difficult to accomplish and maintain. Therefore, many obese individuals, particularly those with severe obesity and comorbidities, are referred for surgical treatment. Evidence supports the decision of bariatric surgery not just because of fat body reduction, but also the substantial long-term morbidity and mortality benefits compared to non-surgical treatment. However, bariatric surgery is not without risks of complications, especially because it involves malabsorption of several nutrients [9-11]. Notably, the most common nutritional deficiencies after bariatric surgery are vitamin B12, iron, folate, calcium and vitamin D. As a result, these deficiencies ought to be recognized early and treated to avoid potential postoperative complications, such as hyperparathyroidism and metabolic bone disease [9]. In summary, obesity is a risk factor for vitamin D deficiency which may be worsened by bariatric surgery. This can contribute to the higher prevalence of metabolic bone disease, resulting in high risk of osteoporosis and fractures. Vitamin D deficiency ought to be recognized and clinically addressed early in obese individuals before bariatric surgery to avoid postoperative complications. No single supplementation approach will optimize vitamin D status in all individuals; as such, vitamin D supplement dosage should be individualized. Endocrinologists, bariatric surgeons, internists among other specialists need to be aware of low vitamin D in obesity and after bariatric surgery.

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