IMPROVEMENT OF HYPOALBUMINEMIA IN MORBIDLY OBESE PATIENTS FOLLOWING LAPAROSCOPIC SLEEVE GASTRECTOMY

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Introduction

The optimization of nutritional status prior to operation is crucial to the patient's postoperative outcome. Malnutrition can lead to postop infection, renal, cardiac complication, gastrointestinal fistula formation, poor wound healing, increased hospital length of stay, and death[1]. Nutritional status can be screened by history and physical, laboratory values including, albumin, prealbumin, or transferrin.[1] Interestingly, many studies show serum albumin level as a predictor of operative mortality and morbidity. [2]

In bariatric patients, only a small population presents with hypoalbuminemia pre-operatively given sufficient nutritional status of bariatric patients. It leads to a question of whether albumin level truly represents nutritional status for bariatric patients. Recent studies show that low serum albumin levels can be related to inflammation-induced capillary leakage and the study found a correlation with albumin level and C- reactive protein (CRP)[3]. many studies report that metabolic syndrome can cause chronic low-grade inflammation which elevation of CRP [4]. Thus, there is a possible link between chronic inflammation with hypoalbuminemia.

The objective of this study is to examine the effects of laparoscopic sleeve gastrectomy (LSG) on serum albumin levels in morbidly obese patients. With morbid obesity being associated with chronic inflammation, we hypothesize that decreased serum albumin levels in bariatric surgery candidates is associated with an obesity-related proinflammatory condition and may improve following LSG.

Methods

Prospectively collected data for consecutive 860 morbidly obese patients who had undergone LSG by a single surgeon between 2013 and 2018 were analyzed. Forty-five (5.23%) patients were found to have hypoalbuminemia preoperatively. Demographic information for these patients is shown in Table 1. Serum albumin levels at three and 12-months post-operatively were available for 26 (58%) and 12 (26.7%) of patients. In addition, C-reactive Protein (CRP) levels preoperatively (n=43) and at 3-month (n=22), and 12-months (n=6) following surgery were also included as a marker of inflammation. Statistical analysis was performed using R with an alpha level of 0.05.

Figure 1.

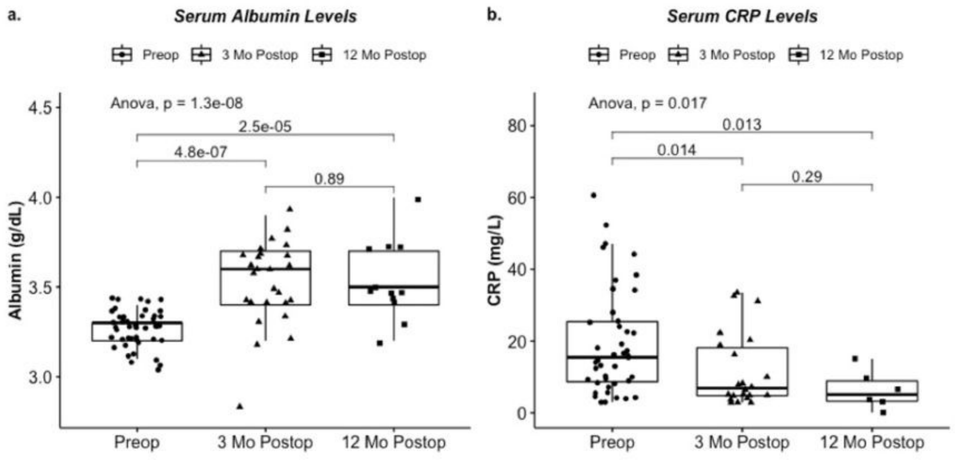


Table 1.

	Patients with Hypoalbuminemia (N=45)
Sex	
F	42 (93.3%)
M	3 (6.7%)
Age	
Mean (SD)	40.0 (9.94)
Median [Min, Max]	37.0 [22.0, 62.0]
Race	
African American	33 (73.3%)
White Caucasian	5 (11.1%)
Hispanic	7 (15.6%)
BMI (kg/m2)	
Mean (SD)	47.1 (5.54)
Median [Min, Max]	47.0 [36.0, 61.0]
Weight (Lbs.)	
Mean (SD)	284 (41.8)
Median [Min, Max]	282 [203, 404]

Results

Mean serum albumin levels were 3.27g/dL, 3.52g/dL, and 3.53g/dL before surgery and at 3 months, and 12 months post-operatively respectively (Fig 1a). Univariate analysis using ANOVA demonstrated a significant difference between pre- and post-operative albumin levels. Post-hoc analysis with pairwise t-tests confirmed significant differences in albumin levels. preoperatively versus both 3- and 12-months after surgery. In fact, 16/26 (61.5%) and 8/12 (66.7%) patients had albumin levels return to normal range at three and 12-months respectively. Mean serum CRP levels were 19.4g/dL, 11.7g/dL, and 6.38g/dL at preoperative testing and at 3 months and at 12 months after surgery respectively (Fig 1b). One-way ANOVA demonstrated significant differences between pre- and post-operative CRP levels.

Conclusion

LSG resulted in significant normalization of both serum albumin and CRP levels in morbidly obese patients with preoperative hypoalbuminemia. This improvement may represent a reduction of inflammation following surgically induced weight loss; however, more study is needed.

Reference

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