Male Sex Hormones Normalize After Laparoscopic Sleeve Gastrectomy

John M. Morton, MD, MPH, FACS, Tara Mokhrati, Archana A. Nair, Homero Rivas, MD, MBA, FACS, Dan E. Azagury, MD,
Stanford Univeresity, Stanford, CA

INTRODUCTION: Obese men have decreased serum testosterone, dehydroepiandrosterone (DHEA), and prostate-specific antigen (PSA). Our study investigated the effect of surgical weight loss following sleeve gastrectomy on testosterone, DHEA, and PSA levels.

METHODS: We prospectively studied twenty-four male patients undergoing laparoscopic sleeve gastrectomy at a single academic institution. Total plasma volume was estimated using patient weight and height. Serum testosterone, DHEA, and PSA were measured preoperatively and again 3, 6, and 12-months after surgery. PSA mass was estimated from participant total plasma volume and serum PSA concentration. Changes in male sex hormones after surgery were determined using paired student t-tests comparing preoperative and postoperative values. Data were analyzed using Stata 13.1/SE (College Station, TX).

RESULTS: Preoperatively, 63% of participants had low serum testosterone levels (<300 ng/dL); by 12-months this number had dropped to 41%. Our cohort experienced a significant increase in average serum testosterone as quickly as 3 months after sleeve gastrectomy and by 12-months, this value had increased from 295 to 423 ng/dL ($p=0.003$). DHEA showed a trend toward increase, from 12.8 to 39.6 ng/mL ($p=0.12$) and serum PSA concentration rose over 12 months from 0.62 to 0.75 ng/mL ($p=0.047$) with no change in PSA mass. Participant plasma volumes decreased after surgery from 84.7 to 77.2 L ($p<0.001$).

CONCLUSIONS: This study suggests sleeve gastrectomy can normalize testosterone levels in obese men. Increased PSA levels with weight loss after surgery in the context of reduced plasma volume and constant PSA mass suggest hemodilution may be causing artificially lower PSA concentration in obese men.