BMI Is Associated with High Grade Index Tumor Volume in Patients with Prostate Cancer

Introduction and Objective: To investigate the impact of BMI on index tumor volume and biochemical failure after radical prostatectomy.
Materials and Methods: We evaluated data from consecutive patients who underwent radical prostatectomy. Data analyzed included age, preoperative serum prostate specific antigen (PSA), prostatic volume, continuous or categorized body mass index (BMI), clinical and pathological findings including index tumor volume (ITV), current smoker, and diabetes status.
Results: We analyzed data from a total of 703 patients. Multivariate linear regression analysis including preoperative variables showed a significant positive association of BMI with ITV, especially with high grade (GS$\geq$7) ITV, independent on pathological advanced stages or positive surgical margins. The interaction term for BMI and high grade ($\geq$GS7) ITV was significant (p=0.03). Biochemical failure (BCR) was noted in 154 patients (21.9%) at a median of 9.7 months postoperatively. Cox proportional hazards analysis showed that continuous BMI was significantly associated with BCR after surgery independent on clinical and pathological findings. In patients with high risk cancer, a positive association between BMI and BCR was enhanced in Cox proportional hazards model (HR 2.11, 95%CI 1.29-3.45, p=0.003).
Conclusions: Higher BMI significantly correlates with a higher rate of BCR after surgery. BMI is found as one of the preoperative variables to predict high grade tumor volume. Our results suggest that biological environment caused by higher BMI may affect high grade prostate cancer growth and yield more to aggressive biology.