

Abstract Type : Oral

Abstract Submission No. : PO-1467

Obesity, inflammation, and renal cell carcinoma

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Objectives: Epidemiologic studies have shown that obesity is associated with renal cell carcinoma (RCC). Obesity causes dysregulation of adipokines, activation of inflammatory cytokines, angiogenesis, and may lead to development RCC and renal injury. We evaluate the relationship between obesity and the risk of RCC, and the impact of obesity on renal outcomes in urologic cancers. In addition, we evaluate the effect of inflammation on the risk of RCC.

Methods: A total of 6,218 patients were enrolled in patients diagnosed with urological cancer at Korea University Anam Hospital and Ansan Hospital from 2001 to 2019. Obesity was defined as body mass index (BMI) ≥ 30 kg/m².

Results: The mean age of the patients was 65.5 ± 12.0 years and 87.3% was male. Out of 6,218 patients, 1011 were diagnosed with RCC, 2002 with urothelial cancer, 136 with genital cancers and 2979 with prostate cancers. RCC was significantly related to younger age, diabetes, higher BMI, CRP and monocyte count. RCC showed 1.584-fold increased risk of obesity than prostate cancer (95% CI, 1.097-2.288). Compared with non-obese patients, patients with obesity were associated with risk of RCC in urologic cancers (RR, 1.901, 95% CI, 1.326-2.724). Serum monocyte count is a stronger risk factor for the risk of RCC (RR, 3.461; 95% CI, 1.079-11.095) in obese patients than non-obese patients (2.174, 95% CI, 1.648-2.867). Obese patients showed higher incidence of 30% and 40% eGFR decline in urologic cancers during 7.7 ± 1.2 years of mean follow up ($P < 0.05$). Obesity was related to increased risk of 40% eGFR decline in urologic cancers by multivariate analysis (1.596, 95% CI, 1.074-2.371).

Conclusions: Obesity was significantly associated with the prevalence of RCC than other urologic cancers. Serum monocyte count is a stronger risk factor for the RCC in obese patients. Obese patients had significant worse renal outcomes in urologic cancers.