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The effect of obesity on renal outcome and death in urologic cancer

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Objectives: Epidemiologic studies have shown that obesity is associated with urologic cancer. Obesity causes dysregulation of adipokines, activation of inflammatory cytokines, angiogenesis, and may lead to development urologic cancer and renal injury. We evaluate the impact of obesity on renal outcomes and mortality in urologic cancers.

Methods: Total 9,902 adult patients diagnosed with urological cancer from 2001 to 2019 were enrolled at Korea University Anam, Guro and Ansan Hospital. Obesity was defined as body mass index (BMI)≥30 kg/m².

Results: The prevalence of renal cell carcinoma (RCC) was 1,732 (17.5%), urothelial cancer 3,026 (30.5%), genital cancer 142 (1.4%), and prostate cancer 5,002 (50.5%). The patients of RCC was younger, had higher BMI, monocyte and CRP than other urologic cancers (P<0.001). Obesity was significantly associated with RCC than prostate cancer (OR 1.493, 95%CI 1.097-2.032). Estimate glomerular filtration rate (eGFR) 40% decline was noted in 10.4% of patients during 3.4±3.8 years, and death was noted in 9.0% during 7.1±5.0 years of follow up in all urologic cancers. In RCC patients without total nephrectomy, the incidence of eGFR 40% decline was significantly lower in obese patients (P=0.015). In RCC patients with nephrectomy, eGFR decline was not associated with obesity. In contrast, the incidence of eGFR 40% decline and ESRD was significantly higher in obese patients (P<0.005). Similarly, obese patients showed significantly lower mortality in RCC and higher mortality in prostate cancer (P≤0.036). Multivariate analysis showed that BMI≥25 kg/m² was protective factor for renal outcome (RR 0.534, 95% CI: 0.293-1.973) in RCC without total nephrectomy. However, BMI≥30 kg/m² had 3.25-fold increase risk for eGFR 40% decline in prostate cancer (95% CI 1.847-5.699).

Conclusions: Obesity was significantly associated with the development of RCC. However, obesity showed better renal outcome and survival in RCC patients. In prostate cancer, obesity significantly increase the risk of eGFR decline and mortality.