

Blood and Serum Se and Zn Levels and 10-Year Survival of Patients after a Diagnosis of Kidney Cancer

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Abstract: The aim of the project was to evaluate the association between selenium (Se) and zinc (Zn) levels in blood and serum and kidney cancer mortality. In a prospective group of 284 consecutive, unselected patients with kidney cancer, we evaluated their 10-year survival in association with the levels of Se and Zn. Micronutrient levels were measured using an inductively coupled plasma mass spectrometer. Patients were divided into quartiles based on the distribution of Se and Zn levels arranged in increasing order. The following variables were taken into account in the multivariable models: age at diagnosis, gender, smoking, type of surgery and histopathological examination results. We observed a statistically significant association of all-cause mortality when subgroups with low blood selenium levels were compared to patients with high selenium levels (HR = 7.74; $p < 0.001$). We found, in addition, that the correlation was much stronger when only men were assessed (HR = 11.6; $p < 0.001$). We did not find a statistically significant association for zinc alone. When we combined selenium and zinc levels (SeQI-ZnQI vs. SeQIV-ZnQIV) we observed the hazard ratio for kidney cancer death to be 12.4; $p = 0.016$. For patients in the highest quartile of blood zinc/selenium ratio compared to those in the lowest the HR was 2.53; $p = 0.008$. Our study suggests that selenium levels, combined selenium and zinc levels (SeQI-ZnQI vs. SeQIV-ZnQIV) and zinc-to-selenium ratio (Zn/Se) are an attractive target for clinical trials aimed at improving survival of kidney cancer patients.

Keywords: kidney cancer; survival; selenium; zinc