Impact of Age at Diagnosis on Cause of Death in Patients with Kidney Cancer

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Introduction

It is presumed that older patients are more likely to die from other causes of death than the cancer and hence the age at which a patient is diagnosed with cancer is a key determinant in the treatment modalities offered to a patient. The relationship between age at diagnosis and cause of death has not been well described for genitourinary cancers.

Aim

To examine the variation in causes of death with respect to age at diagnosis for patients diagnosed with non-metastatic kidney cancer

Methods

- We analyzed the records of patients in the **SEER Database** diagnosed with a localized (N0M0) renal cell carcinoma between the ages of 45 and 74 from 2003 to 2015.
- Exclusion Criteria: multiple primary tumors, unknown cause of death and mortality data
- Univariate and multivariate Cox proportional hazards regression was performed to investigate mortality and cause of death.
- Kaplan – Meier survival estimates were obtained for kidney cancer – specific and all cause of death at 5 and 10 years from diagnosis to calculate attributable cause of death to kidney cancer by age at diagnosis.
- Chi Squared test of independence was performed to assess for the association between age at diagnosis and cause of death.
- P-values less than 0.05 were considered to be statistically significant

Results

Cox Proportional Hazards Ratio treating Age as a Continuous Variable

5 year:

Kidney Cancer: HR 1.032 (95% CI: 1.028 – 1.037, p < 0.001)

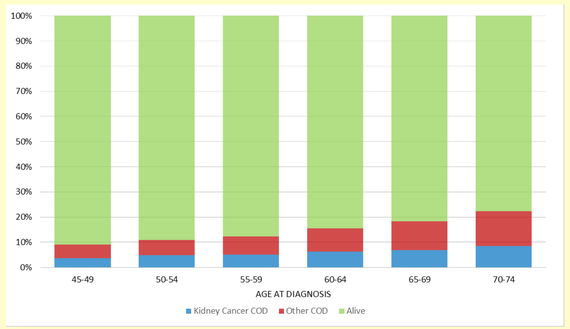
All Cause: HR 1.041 (95% CI: 1.038 – 1.043, p < 0.001)

10 year:

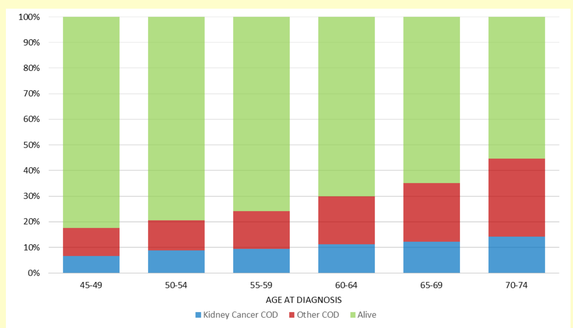
Kidney Cancer: HR 1.031 (95% CI: 1.027 – 1.035, p < 0.001)

All Cause: HR 1.044 (95% CI: 1.041 – 1.046, p < 0.001)

Kaplan-Meier Survival Estimates with percentage of cancer-specific death, other cause of death and alive at 5 (top) and 10 (bottom) years from diagnosis

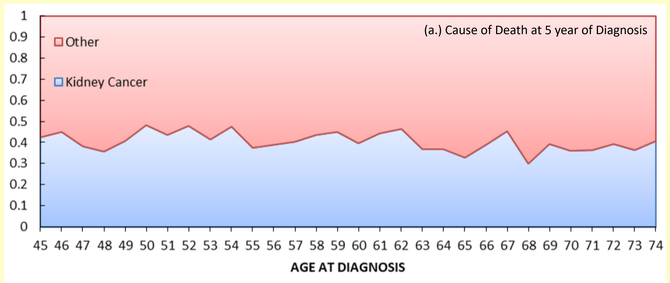


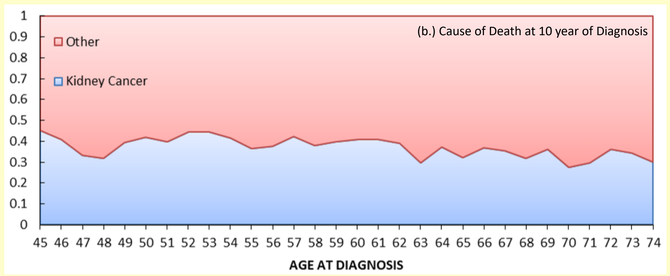
Age	45 – 49	50 – 54	55 – 59	60 - 64	65 - 69	70 - 74
Alive	0.909	0.891	0.877	0.846	0.817	0.776
Other Death	0.054	0.059	0.072	0.091	0.115	0.140
Cancer Death	0.036	0.050	0.051	0.063	0.068	0.084



Age	45 – 49	50 – 54	55 – 59	60 - 64	65 – 69	70 - 74
Alive	0.824	0.794	0.758	0.700	0.649	0.553
Other Death	0.110	0.119	0.148	0.187	0.230	0.306
Cancer Death	0.066	0.088	0.095	0.113	0.121	0.141

Attributable Cause of Death using Kaplan-Meier survival estimates at 5 (top) and 10 years (bottom) after diagnosis by age at diagnosis





Chi-Squared test of Independence

On Chi-squared analysis, the association between age at diagnosis and cause of death was not significant at 5 years ($\chi^2 = 1.850$, $p < 0.1738$) but significant at 10 years ($\chi^2 = 23.094$, $p < 0.001$)

Conclusions

The attributable cause of death to kidney cancer within the first 5 years of diagnosis is similar for patients diagnosed at a younger age as compared to those diagnosed at an older age. Older patients have a higher absolute risk of death from kidney cancer than younger patients.