

Serum Arsenic Level in 5-Years Survival of Prostate Cancer Patients

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Abstract:

Prostate cancer is the most common type of cancer affecting men worldwide and the second most common cause of cancer-related deaths in men. Identifying modifiable risk factors is crucial to improving survival. Imbalances in trace elements may influence survival outcomes.

In our study, we measured the association between serum arsenic level and survival of histopathologically confirmed prostate cancer patients (n=324). Arsenic level was measured in serum taken after diagnosis and prior to treatment by inductively coupled plasma mass spectrometry (ICP-MS). The observation period lasted up to five years. All study participants were assigned to the quartiles (QI-QIV) based on the distribution of serum arsenic level among the alive patients. Univariable and multivariable COX regression models were used to calculate hazard ratios (HR) for each quartile of serum arsenic level. Multivariable models include the following factors as explanatory variables: age of diagnosis ($\leq 60 / > 60$), Gleason ($< 7 / 7 / > 7$), PSA ($< 4 / 4 - 10 / > 10$) and vital status during follow up (alive/dead).

A significant association was found between low serum arsenic levels and lower overall survival in prostate cancer patients (HR = 2.17; 95% CI: 1.15-4.11; $p = 0.017$). Prostate cancer patients who died because of the prostate cancer itself, low serum arsenic levels were also significantly related with worse survival (HR = 2.72; 95% CI: 1.15-6.40; $p = 0.022$). Prostate cancer patients who died from non-prostate cancer-related causes exhibited no statistically significant differences.

These results indicate the need for further research to determine reference arsenic level across different populations, with the goal of optimizing serum levels of this element in individuals with prostate cancer.