

Metals, arsenic and selenium and risk of pancreatic cancer

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Background and Aims: Limitations in knowledge on the etiology of exocrine pancreatic cancer (EPC) hamper primary prevention interventions. Although scarce, there is some evidence supporting associations between trace elements and EPC. The aim was to evaluate the association between concentrations of twelve trace elements in toenails and EPC risk.

Methods: We studied 118 EPC cases and 399 hospital controls with available toenail samples. Levels of trace elements were determined by inductively coupled plasma - mass spectrometry. Odds ratios (OR) and 95% confidence intervals (CIs) were calculated using logistic regression, adjusting for potential confounders.

Results: Significantly increased risks of EPC were observed among subjects presenting the highest concentrations of arsenic ($OR_{\text{upper quartile}} = 1.90$, 95%CI 1.02-3.53; P-trend = 0.015), cadmium ($OR_{\text{upper quartile}} = 3.43$, 95%CI 1.79-6.57; P-trend = 6×10^{-6}) and lead ($OR_{\text{upper quartile}} = 6.17$, 95%CI 2.67-14.27; P-trend = 5×10^{-5}). Higher concentrations of selenium ($OR_{\text{upper quartile}} = 0.05$, 95%CI 0.02-0.14; P-trend = 3×10^{-11}) and nickel ($OR_{\text{upper quartile}} = 0.26$, 95%CI 0.12-0.56; P-trend = 2×10^{-4}) were inversely associated with EPC risk.

Conclusions: These novel findings, if replicated in independent studies, suggest an important role of trace elements in EPC risk and pancreas carcinogenesis, and the potential benefits of policies aimed at decreasing population exposure to arsenic, cadmium and lead.