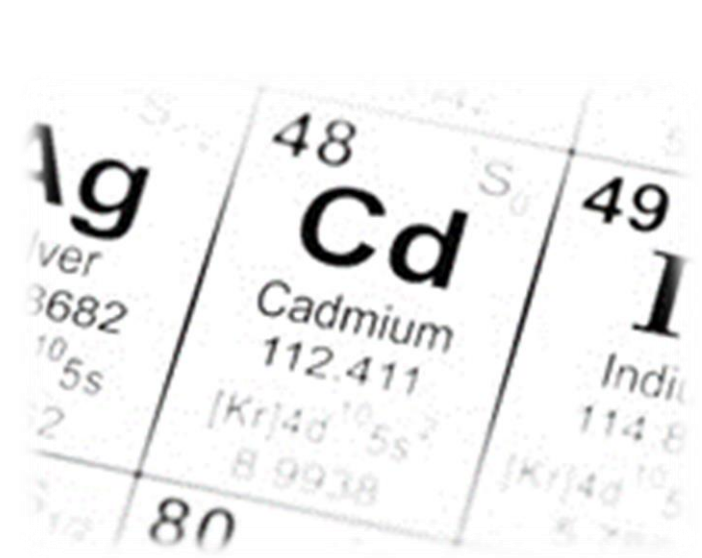


Correlation between cadmium and selenium blood levels in an Italian population



Filippini Tommaso¹, Storani Simone¹, Malagoli Carlotta¹, Arcolin Elisa¹, Iacuzio Laura¹, Castiglia Paolo², Michalke Bernhard³, Vinceti Marco¹.

¹Environmental, Genetic and Nutritional Epidemiology Research Center (CREAGEN), Department of Diagnostic, Clinical and Public Health Medicine, University of Modena and Reggio Emilia, Reggio Emilia, Italy;
²Department of Biomedical Sciences, Hygiene and Preventive Medicine Unit, University of Sassari – AOU Sassari, Sassari, Italy;
³Research Unit Analytical BioGeoChemistry, Helmholtz Zentrum München – German Research Center for Environmental Health GmbH, Munich, Germany.

Background and aims

Cadmium (Cd) is established as a human carcinogens while selenium (Se) is a metalloid showing an intriguing relation with human health, particularly with cancer. Se is usually present both in the environment and in living organisms in various inorganic and organic

forms, having considerable variations in both their toxicological and physiological properties. The aim of this study was to explore the relation of these two elements in a sample of Modena municipality residents.

Methods

The concentrations of Se species (organic and inorganic) and Cd were analyzed in serum of fifty subjects randomly selected from the general population of the municipality of Modena, northern Italy, aged from 35 to 70 years. Samples were collected during a 30-month period, and determinations were carried out using high pressure liquid chromatography

coupled with inductively coupled plasma dynamic reaction cell mass spectrometry. Linear unadjusted and adjusted regression analyses were performed, including in the models age, body mass index, smoking habits, energy intake (Kcal/die), time from sample collection, and dietary Cd intake.

Results

Median (25th-75th) serum levels were 40.85 (30.05 – 53.50) ng/l and 118.5 (109 – 136) µg/l for Cd and Se, respectively. Crude regression β coefficients were -0.320 (95% CI -0.550, -0.089; *P*=0.008), -0.195 (-0.448, 0.058; *P*=0.128), 0.240 (-0.124, 0.605; *P*=0.191) and -0.019 (-0.191, 0.152; *P*=0.821) for total, inorganic and organic

Se species and for glutathione peroxidase-linked Se. In multivariate analysis, adjusted β values were -0.219 (-0.471, 0.032; *P*=0.086), -0.072 (-0.345, 0.201; *P*= 0.598), -0.129 (-0.478, 0.221; *P*=0.461) and -0.141 (-0.330, 0.047; *P*=0.138), respectively.

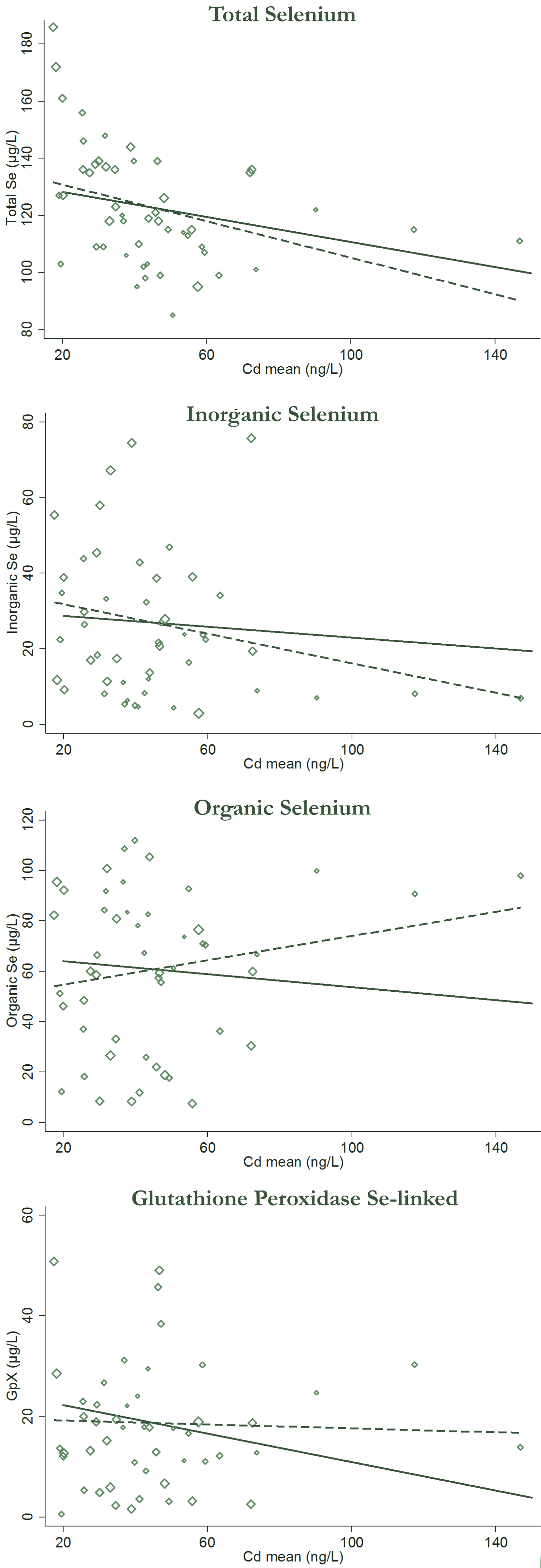
	Crude			Adjusted		
Se Species	β	95% CI	<i>P</i>	β	95% CI	<i>P</i>
Total Se	-0.320	(-0.550, -0.089)	0.008	-0.219	(-0.471, 0.032)	0.086
Inorganic Se	-0.195	(-0.448, 0.058)	0.128	-0.072	(-0.345, 0.201)	0.598
Organic Se	0.240	(-0.124, 0.605)	0.191	-0.129	(-0.478, 0.221)	0.461
GpX	-0.019	(-0.191, 0.152)	0.821	-0.141	(-0.330, 0.047)	0.138

Table: Linear regression coefficients in crude and multivariate analysis. Adjusting variables included age, BMI, smoking habits, time from sample collection (in months), energy intake (Kcal/die) and dietary Cd intake (µg/die).

Conclusions

These results suggest an inverse correlation of Cd with total Se in human blood, mainly due to an inverse relation with inorganic Se species and with glutathione peroxidase-Se, with potential

implications for the toxic effects of both Cd and Se, as well as for the nutritional availability of Se.



Figures: Analysis between cadmium and total selenium (and selenium species) blood levels using univariate(solid line) and multiple (dash line) regression models. Markers size is weighted by age of subjects.



Mail to: Prof. Marco Vinceti
at CREAGEN – Environmental, Genetic and Nutritional Epidemiology Research Center, University of Modena and Reggio Emilia, Via Campi 287 – 41125 Modena.
marco.vinceti@unimore.it

UNIMORE
UNIVERSITÀ DEGLI STUDI DI
MODENA E REGGIO EMILIA



Creagen

Absorption Spectrum of Selenium



Absorption Spectrum of Cadmium

