





2017 SCIENTIFIC MEETING ITALIAN ASSOCIATION FOR THE STUDY OF TRACE ELEMENTS IN LIVING ORGANISMS - AISETOV

REGGIO NELL'EMILIA (ITALY), OCTOBER 20, 2017



Prampolini square and the Dome of Reggio Emilia

TRACE ELEMENTS IN HUMAN AND ANIMAL HEALTH: FOCUS ON NEUROLOGICAL DISEASE

ABSTRACT BOOK

Organized by:

AISETOV and UNIVERSITY OF MODENA AND REGGIO EMILIA

P-09. Correlation between intake and biomarker levels of cadmium and selenium in an Italian population: implications for biomonitoring studies

<u>Marcella Malavolti</u>¹, Tommaso Filippini¹, Carlotta Malagoli¹, Silvia Cilloni¹, Marianna Venturelli¹, Bernhard Michalke², Marco Vinceti¹

¹Research Center for Environmental, Genetic and Nutritional Epidemiology University of Modena and Reggio Emilia, Modena, Italy;

²Helmholtz Center Munich – German Research Center for Environmental Health GmbH, Research Unit Analytical BioGeoChemistry, Neuherberg, Germany

Background and aim: Cadmium (Cd) is an established carcinogenic metal, while selenium (Se) is a metalloid with both nutritional and toxic effects that shows an intriguing relation with human health, particularly with cancer and neurodegenerative diseases. This characteristic depends on its concentration and on the chemical species considered. The aim of the study is to investigate, in a general population of Modena municipality, Cd and Se levels and their correlation, having a strong implication for human health and especially when performing biomonitoring studies.

Methods: Fifty participants, randomly extracted from Modena residents, completed an anamnestic and lifestyle questionnaire. The dietary habits of this population were assessed through a semi-quantitative food frequency questionnaire specifically designed for the central-northern Italian population within the EPIC study, in order to assess Ca and Se intake. Blood samples were analyzed to evaluate the serum concentrations of cadmium, total selenium and its chemical species.

Results: The median intake (interquartile range) estimated by the questionnaire was 13.4 μ g/day (10.4-16.6) for cadmium and 92.0 μ g/day (68.8-116.3) for selenium. In the current population the foods mainly contributing to cadmium intake were cereals, vegetables and sweet snacks (e.g. chocolate); while for selenium were fish, meat and cereals. Spearman's correlation coefficient between cadmium and selenium intake was 0.88 (95% Confidence Interval 0.80 to 0.93). Serum concentrations were 0.041 μ g/L (0.030-0.055) for Cd, 118.5 μ g/L (109-136) for total selenium including 21.2 μ g / L (8.9-34.8) for inorganic and 95.9 μ g / L (80.7-108.8) for organic species. The linear correlation coefficient (beta) between cadmium (independent variable) and total selenium, inorganic and organic species, were respectively -0.43 (95% CI - 0.75 to -0.12), -0.27 (9% CI -0.63 to 0.10) and 0.14 (95% CI -0.09 to 0.36) in unadjusted model and -0.50 (95% CI -0.87 to -0.13), -0.21 (95% CI -0.62 to 0.19) and 0.09 (95% CI -0.15 to 0.33) in adjusted model for age, sex and smoking habits.

Conclusions: Our results suggest a correlation between the intake of the two elements. On the contrary, the correlation between blood levels of Cd and Se species reveals a different and more complex behavior, showing an indirect association with the inorganic Se species and a slightly positive interaction for organic Se forms.

Printed in Reggio Emilia (Italy)



20 October 2017