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*Prampolini square and the Dome of Reggio Emilia*

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

**ABSTRACT BOOK**

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**O-03. Selenium in human neurodegenerative diseases: friend or foe?**

Marco Vinceti, Tommaso Filippini, Carlotta Malagoli

CREAGEN – Environmental, Genetic and Nutritional Epidemiology Research Center, Department of Biomedical, Metabolic and Neural Sciences, University of Modena and Reggio Emilia, Italy

Selenium is a metalloid of considerable interest for human health, from both a toxicological and a nutritional perspective. However, the exact safe range of intake of this element as well as its health effects, including those on the central nervous system, are still unclear despite the large number of studies devoted to these issues in the last years.

Several laboratory studies have suggested a beneficial role of selenium in the prevention of the pathological processes underlying the onset of Alzheimer's disease and Parkinson's disease, possibly due to the antioxidant activity of selenoproteins. However, the relevance of these findings to the human is unclear. In addition, laboratory studies have also highlighted the neurotoxicity of several selenium species, probably due to their pro-oxidants effects, in sharp contrast with the well known antioxidant properties of selenoproteins.

Concerning epidemiologic studies, both reduced and excess selenium levels have been linked to an increased risk of Alzheimer's disease and of Parkinson's disease, while results for cognitive decline are insufficient to draw reliable conclusions. Some epidemiologic studies have suggested that an excess exposure to environmental selenium may increase the risk of amyotrophic lateral sclerosis, and this may also be true for the disease subtype associated with gene mutations.

Assessing the involvement of selenium in human neurodegenerative disease is extremely difficult. In case-control and cross-sectional studies, the changes (generally the reduction) of selenium status as suggested by its body levels may be due to reverse causality, i.e. to an effect of the disease, therefore not being of etiologic interest. In addition, biomarkers of selenium exposure such as blood, urine and hair selenium levels may not reflect the concentrations of the element in the target tissue, i.e. in the central nervous system. Finally, the different nutritional and toxicological properties of the various selenium species should be always taken into account in the assessment of the relation between this trace element and human neurodegenerative diseases.

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