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

ABSTRACT BOOK

Organized by:

AISETOV and UNIVERSITY OF MODENA AND REGGIO EMILIA

P-02. Environmental and occupational exposure to heavy metals and metalloid and development of amyotrophic lateral sclerosis: a population-based case control study in Emilia-Romagna and Sicily

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Background and aim: Amyotrophic lateral sclerosis (ALS) is a progressive, fatal neurodegenerative disease of the motor neuron. Its etiology is still largely unknown, except for some rare forms of genetic origin. Many environmental and occupational risk factors have been evaluated as risk factors, including exposure to heavy metals, such as lead and mercury, and a metalloid, such as selenium. Clarifying the environmental component of ALS etiology could yield a better understanding of disease pathophysiology.

Methods: We performed a population based case-control study in three Italian provinces (Modena, Reggio Emilia and Catania) in order to assess the possible etiologic role of some environmental and occupational risk factors. We administered 877 questionnaires by mail or by person in a neurological office to newly-diagnosed ALS cases in the 2008-2011 period and age- and sex-matched population controls. The administered questionnaires collected information about personal, clinical and professional history, including job-related or hobby-related use of many trace elements and chemicals.

Results: Among the 162 returned questionnaires, 61 were cases and 101 controls, with an average response rate of 18.5%. The analyses, adjusted for age and sex, showed an increased risk when examining clinical information for reported occupational exposure to lead (odds-ratio OR 3.52, confidence interval-CI 95% 1.43 to 8.64, p=0.006), mercury (OR 6.16, 95% CI 0.66 to 57.72, p=0.111), while no increased risk was found to be associated with reported exposure to cadmium (OR 0.74, 95% CI 0.06 to 8.63, p=0.814). Finally, a slight although imprecise increase risk was found with occupational exposure to selenium (OR 1.67, 95% CI 0.22 to 12.39, p=0.610).

Conclusions: Our results seem to suggest a potential etiologic role of investigated trace elements and risk of ALS. However, the risk of possible selection bias due to the low response rate and information bias (i.e. recall bias) need to be carefully considered and worthy of further studies.

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