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**TRACE ELEMENTS BETWEEN DEFICIENCY AND
TOXICITY:
UPDATE AND PERSPECTIVES**

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P5 - Cadmium, lead and mercury levels in cerebrospinal fluid and risk of amyotrophic lateral sclerosis – A case-control study

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Background and aims

Many studies poses the question of neurotoxic effect of heavy metal and risk of Amyotrophic Lateral Sclerosis (ALS). The aim of the study was to assess the levels of cadmium (Cd), lead (Pb) and mercury (Hg) in 38 ALS patients and 38 sex and age matched neurologic hospital-referred controls by using cerebrospinal fluid (CSF), a CNS biomarker of exposure.

Methods

The 38 ALS cases included 16 men and 22 women, with mean age of 55.5 years (range 30.7–76.4 years), while 38 controls were patients who underwent lumbar puncture, suspected but later unconfirmed for neurological disease. Heavy metals concentration were performed using high pressure liquid chromatography (HPLC) coupled with inductively coupled plasma dynamic reaction cell mass spectrometry (ICP-DRC-MS) according to methodologies previously established for biological matrices, specifically for CSF.

Results

Median values (25th-75th) for cadmium (Cd), lead (Pb) and mercury (Hg) were 71.55 ng/l (22.0-105.0), 132 ng/l (69.5-497.0) and 216.5 ng/l (32.0-634.0) in controls and 35.9 ng/l (24.6-66.8), 155.0 ng/l (70.1-351.0) and 195.5 ng/l (125.0-264.0) in ALS patients, respectively. In logistic regression analysis, we did not evidence an association between ALS risk and CSF Cd content. An imprecise increase risk was found in crude and age-adjusted models with ORs between highest vs. lowest tertiles of 1.37 (0.50-3.82) and 2.84 (0.75-10.80) for Pb, and 4.06 (0.44-37.28), and 6.14 (0.57-65.95) for Hg. Gender stratified analysis shown higher risk for females than males.

Conclusions

Our results did not suggest a major role of exposure to cadmium in increasing ALS risk, while results for lead and mercury need further investigations.