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Evaluation of heavy metal blood concentrations in patients with essential tremor: A preliminary study

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Abstract

Essential Tremor (ET) is one of the most common mobility disorders, affecting 1% of the population. Both genetic and environmental factors may trigger the pathophysiology that eventually causes ET. Pb blood levels in ET patients have been studied. However, there are no clear data in the literature evaluating the blood levels of other heavy metals (aluminum, chromium, manganese, nickel, copper, zinc, cadmium, antimony, tin) in ET patients. We aimed to investigate the relationship between heavy metal blood levels and tremor characteristics of ET patients. A total of 110 ET patients and 146 healthy controls were included. The control group was subdivided into Control-1 (52 patients' household members) and Control-2 (94 unrelated healthy individuals). The average age of patients was 52.10±17.00 and that of the control group was 46.00±15.85. All patients underwent a detailed neurological examination, and Basic Tremor Evaluation Scale, Fahn-Tolosa-Marin Tremor Scales were recorded for the patient group. Peripheral blood samples were collected from all participants and heavy metal levels were examined and analyzed. The Al, Cd, Cr and Sb blood levels were statistically significantly higher in ET patients than in the control group (for Al; $\chi^2=8.684$; $p=0.013$, for Cd; $F=7.883$, $p<0.001$, or Cr; $\chi^2=8.175$; $p=0.017$, for Sb; $\chi^2=9.075$; $p=0.011$). The duration of the disease was found to be positively correlated with Al blood levels ($r=0.227$, $p=0.017$). Our results revealed that ET is associated with elevated blood levels of Al, Cd, Cr and Sb. Investigating the etiological role of heavy metals will enable the establishment of novel therapeutic approaches to prevent or cure ET.

Keywords: essential tremor, heavy metal, etiology, toxicity, spectrometry

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