البحث السابع

Hair and Blood Levels of Aluminum, Cadmium, and Lead in Children with Autism from Egypt: Can Toxic Heavy Metals Increase the Risk of Autism?

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Abstract

Background: Autism, a neurodevelopmental disorder that manifests early in childhood but the pathogenic risks are controversial, and some environmental factors are thought to be involved. The association between toxic heavy metals and autism is currently a subject of research, and studies are underway on the role of toxic heavy metals in Egypt, focusing on the social, cultural, and environmental aspects. We investigated the aluminum, cadmium and lead levels in the hair and blood samples of Egyptian autistic children.

Methods: This study was conducted between July 2021 and December 2022 on 32 children with diagnosed autism, aged three to 13 years old, whom were compared with 30 age- and gender-matched children (normal controls). These children were subjected to childhood autism rating scale (CARS), and IQ tests. Also, the aluminum, cadmium, and lead levels were measured in their hair and blood samples for further statistical analyses.

Results: The autistic children had significantly higher levels of aluminum, lead, and cadmium in the hair samples compared to those of the controls. Also, the blood levels of aluminum and cadmium were significantly higher in the autistic children. Those with severe autism had a higher level of hair aluminum compared to those with mild autism. We found positive correlations among the CARS data versus hair aluminum and blood cadmium levels. The regression analyses on blood cadmium levels were also predictive of CARS.

Conclusion: The study findings suggest a likely role for the three heavy metals as being the potential environmental triggers of autism in children.

Keywords: Aluminum; Autism; Cadmium; Egypt; Lead