

## Novel Treatment for Lead Exposure in Children with Autism

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Lead can inhibit the ionotropic *N-methyl*-d-aspartate type of glutamate receptors leads to the gene and protein expression of NMDAR subunits changes [6]. Moreover, the correlation of gene expression and lead levels in blood in children with autism compared to typically developing controls is different [12]. Even very low level of lead exposure in childhood may cause lifelong impairment of attention, memory and learning deficits [1, 8].

Meanwhile, urinary lead excretion rate in autism is decreases in compare to typically developing control group [13]. In addition, the level of lead in hair [5, 7] and nail [7] of children with autism is higher than healthy children group [7]. However, the management of this high level of lead is not fully clear. Chelating therapy with succimer (dimercaptosuccinic acid) decreases blood lead levels [11] but it does not improve cognition, behavior, or neuropsychological function [2]. So, the prevention of exposure to lead or some alternative methods is required [2]. Herein, a novel hypothesized clinical and research implication for methionine choline as a novel treatment for lead exposure in children with autism is mentioned.

A natural chelating agent for heavy metals is Methionine [4]. L-methionine is also an antioxidant for lead induced oxidative stress [10]. In addition, prophylactic supplementation of methionine is effective for increasing superoxide dismutase and the prevention of lead neurotoxicity induced learning and memory impairment [3]. Oxidative stress in autism is higher than healthy individuals [9]. In addition, methionine choline reverses lead-induced cognitive deficits [4].

So, considering the high level of lead in autism [5, 7], ineffectiveness of chelating therapy for improving cognition, behavior, or neuropsychological function [2], the need for finding some alternative methods for management of neuropsychological impairments due to lead [2], considering the nutrient methionine for prevention of lead neurotoxicity [3], and improvement of lead-induced cognitive deficits by methionin choline, it is worth conducting studies such as translational clinical trials that may open a new media for treatment of at least some children with autism.

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