



# Protective effects of folic acid against central nervous system neurotoxicity induced by lead exposure in rat pups

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Genet. Mol. Res. 14 (4): 12466-12471 (2015)  
Received February 23, 2015  
Accepted July 2, 2015  
Published October 16, 2015  
DOI <http://dx.doi.org/10.4238/2015.October.16.13>

**ABSTRACT.** Recent studies found folic acid is associated with lower blood lead (Pb) levels, and folate deficient children are more susceptible to the negative cognitive effects of Pb. This study evaluated the protective effects of folate supplementation against Pb exposure in rat pups and the mechanisms of protection. A total of 72 rats were used. Thirty were administered Pb only; 30, Pb and folic acid at the same time; and 12, only physiological saline. Protective effects of folic acid were examined at 14, 21, and 28 days after treatment. Lower blood Pb levels were found in all of the samples collected from the rats treated with folic acid. Downregulation of Bc1-2 expression and upregulation of Bax expression were observed in the neurons of folic acid-treated rats. Significantly more hematoxylin and eosin stained neurons were found in the folic acid treatment group. Nuclear enrichment and neuron apoptosis were observed by electron microscopy in the Pb-treated group. In conclusion, this study demonstrated that folic acid supplementation might offer efficient protective effects against Pb poisoning in rat pups, which was associated with less neuron damage and lower blood levels of Pb.

**Key words:** Rat pups; Lead poisoning; Central nervous system; Folic acid