# Abstract Information


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| **Title :** | The hallmark of Docosahexaenoic acid against the Manganese intoxication in mice: links with Parkinsonism |
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**Abstract :**

Manganese (Mn) is an essential metallic trace element involved in several vital biological functions. Conversely, exposure to excessive levels of Mn induces manganism, causing neurodegeneration and symptoms similar to Parkinson's disease. Docosahexaenoic acid (DHA) is a long-chain polyunsaturated fatty acid exhibiting neuroprotective properties against neurodegenerative diseases and brain injuries.

In the present study, mice were used for a sub-acute Mn intoxication model to investigate DHA neuroprotective potential against Mn neurotoxicity. We also seek to understand the mechanism by which Mn intoxication induces these motor impairments at 30 mg/kg, by pretreatment with DHA at 300 mg/kg and assessment of changes in spontaneous locomotor behavior by open field test (OF), motor coordination using the rotarod test (RR) and strength by mean of weights test (WT). To highlight these effects on brain neurotransmission, we evaluated the tyrosine hydroxylase immunoreactivity (TH-IR) within substantia nigra compacta and striatum. Results showed that Mn intoxication significantly ($p<0.001$) altered motor behavior parameters including, decreased of traveled distance by 46%, decreased mean speed by 36%, reduced the ability to sustain the rotarod test to 42%. Pretreatment by DHA prevents mice from Mn toxicity and maintain normal spontaneous activity, motor coordination and strength. Data also showed the ability of Mn to disrupt dopamine neurotransmission by altering tyrosine hydroxylase activity, DHA prevented this disruption. Data approved the potential neurotoxic effect of Mn as a risk factor of the Parkinsonism onset, and then demonstrated for the first time the neuroprotective and nutraceutical outcomes of DHA in the sub-acute Mn-intoxication animal model.

Keywords: Manganese; DHA; Parkinsonism; Locomotor activity; Dopamine; substantia nigra, striatum, mice.