



## Neurotoxicity: A Very Worse Kind of Toxicity

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### Introduction

Neurotoxicity is a kind of toxicity in which a biological, chemical or physical agent produces an adverse effect on the structure or the function of the central or peripheral nervous system. Its main root cause is that it occurs when any neurotoxin or neurotoxicant changes or hampers the normal function/activity of the nervous system in such a manner that the damage done is reversible or sometimes permanent. In this process sometimes the brain cells/neurons are killed or damaged and hence they are unable to transmit & process signals in the brain or the other parts of the nervous system of the human body. [1] Neurotoxicity might occur due to a number of things or processes for instance it can occur due to the transplantation of the organs, use of radiation therapy for treating cancerous cells, different drug therapies, drug use for recreation, bites from different reptiles like certain lizards & snakes, pesticides, exposure to different heavy metals. Different types of signs & symptoms are commonly visible in the patients which are having neurotoxicity for instance confusion, mental fatigue, loss of memory, numbness of limbs, weakness, headaches, delusions, issues with sexual health & behavior. There are certain commonly occurring natural substances which may impair neurocognitive performance if long time exposure is done for example amyloid beta ( $A\beta$ ), glutamate, dopamine, and oxygen radicals. Whenever they are present in higher concentrations in the brain they lead to neurotoxicity & neuron death starts taking place (we term this process as apoptosis). [2] Whenever cell death takes place in the brain it causes loss to motor control mechanism of the brain, deterioration of the cognitive functions & loss of proper function of the nervous system. The new research published in different peer-reviewed journals globally concludes that a major cause of nearly all neurological disorders & neurodegenerative diseases such as Alzheimer's disease is neurotoxicity. Depending on a neurotoxin's chemical profile it will damage certain parts or cellular elements of the human nervous system. Non polar substances are the real culprit as they can access the nervous tissues very easily than the polar substances as they are very less soluble in the lipids. Our body's response depends

on various factors such as how much the neurotransmitter is affected, cellular membrane integrity & the presence of detoxifying mechanism. We ask common folks to keep themselves away from certain neurotoxic substances which are commonly found like insecticides, car exhausts, solvents, mercury, chlorine etc. [3] Diagnosis of neurotoxicity is made by performing a nerve conduction test. There are certain tests designed to detect even the minor neurotoxicity or minor chemical imbalances like pupillography, computerized balance heart rate variability, neurophysiological testing, brain imaging with the triple-camera SPECT system. Treatment strategy of neurotoxicity is simply removal or complete elimination of the toxic substances & therapies to relieve symptoms or to provide support. Commonly the support therapies that we see are massage, exercise & immune modulation. Prognosis of neurotoxicity depends more on the extent of exposure & the duration as well as the degree of the neural damage being caused by the toxicants. [4] Exposures with some neurotoxicants can be fatal in some cases & in some cases it is not that much fatal & the patient gets healthy very soon. [5] Ongoing researches: Scientific community globally are looking & assessing at whether occupational & environmental toxins play major role in all neurological diseases or not & if not then at what extent.

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**Received:** 01-Jan-2022, Manuscript No. tyoa-22-53041; **Editor assigned:** 02-Jan-2022, PreQC No. tyoa-22-53041 (PQ); **Reviewed:** 21-Jan-2022, QC No tyoa-22-53041; **Revised:** 26-Jan-2022, Manuscript No. tyoa-22-53041 (R); **Published:** 27-Jan-2022, DOI: 10.4172/2476-2067.1000168

**Citation:** Sugawara A (2022) Neurotoxicity: A Very Worse Kind of Toxicity. *Toxicol Open Access* 8: 168.

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