

Synthetic Cannabis: The Neurotoxic Segment †

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Abstract: The Novel Psychoactive Substances are the most widely abused drugs in the contemporary world. Synthetic Cannabis belongs to this group of substances. It is a cannabinoid that differs from delta-9-tetrahydrocannabinol as they act as complete or full agonists for the endocannabinoid receptors CB1 and CB2. Synthetic Cannabis is thus more psychoactive and produces a greater effect on humans. It has a detrimental effect on the brain and primarily affects the CNS in two ways: 1) Neural hyper stimulation via an increase in the activation of certain neurotransmitters such as norepinephrine, dopamine, and serotonin 2) Cause significant reduction in CNS neural connectivity affecting various regions of the brain such as the cerebellum, hippocampus, basal ganglia, parietal lobe, and globus pallidus. A range of neurotoxic effects is found to occur, including the reduction of grey matter and white matter of the left temporal lobe of the human brain, reduction in the size of thalamus and epithelium, reduction of subcortical structures, and also the brain stem. Some of the other neurotoxic effects include disruption of mitochondrial function and dynamics, dysregulation of neurotransmission, epigenetic alterations, overproduction of ROS, and impairment of neuroimmunomodulation. Agitation, confusion, and paranoia are the most common CNS manifestations resulting from Synthetic Cannabis. Status-epilepticus and stroke are two other severe manifestations caused by this drug.

Keywords: novel psychoactive substances; synthetic Cannabis; neurotoxicity; drug abuse.

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Conflicts of Interest

The authors declare no conflict of interest.