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## **Marijuana + Alcohol = Massive Brain Cell Death**

### *In the womb*

Marijuana is by far the most common illicit drug in the western world. However, pregnant women should be aware that this drug could affect severely the brain development of the children in their wombs. THC, the main active chemical of marijuana, enters into the fetal blood causing intrauterine growth retardation and a temporary syndrome comprising lethargy and lowered muscle tone, but also, on long term, attention deficits, learning disabilities and behavioral issues. A new research published in the *Annals of Neurology* points that THC, combined with alcohol, can cause massive brain cell death. The team at the Neuroscience Research Center of the Humboldt University in Berlin and the Department of Pediatric Neurology, University of Technology, Dresden, Germany, exposed rats, 1 to 14 days old, to THC, a synthetic type of THC, ethanol, MK-801 (an anticonvulsant) and phenobarbital. It was known that ethanol and drugs like sedatives, anesthetics and anticonvulsants caused massive brain cell death in the developing brain of immature rodents. The new study found that THC and its synthetic type did not induce neurodegeneration when administered alone, but it had this effect even when combined with low amount of alcohol non-toxic by itself. The effect was spurred gradually by increased doses of THC and was stronger in 7-day old rats. THC also boosted the neurotoxic impact of phenobarbital and MK-801 (which combined have the same effect as alcohol). THC is known to act on CB1 receptors, inducing the psychomotor, memory, cognition and pain perception changes caused by marijuana consumption. THC, combined with alcohol, was found to have increased psychoactive effect, and the CB1 receptor blocker Rimonabant, an anti-obesity drug, decreased these effects. Mice lacking CB1 receptors were less vulnerable to the neurotoxic action of alcohol, thus these receptors could be the ones to induce the increased toxicity of the alcohol. Previous researches had found that endocannabinoids (chemicals similar to cannabinoids (like THC and other chemicals in marijuana and hashish) synthesized by the human body) could boost cell multiplication and survival during the development of the central nervous system, explaining the age connection of the impact of THC/alcohol combination detected by this research. "With the use of behavioral and stereological techniques such studies would explore whether acute changes reflect permanent neuronal loss and lead to behavioral deficits. The results of the acute studies have interesting potential therapeutic implications including the use of CB1 receptor antagonists for preventing brain damage in fetuses and neonates exposed to ethanol, sedative and/or anticonvulsant drugs," wrote the authors.