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## The surprising effect of cannabis on morphine dependence

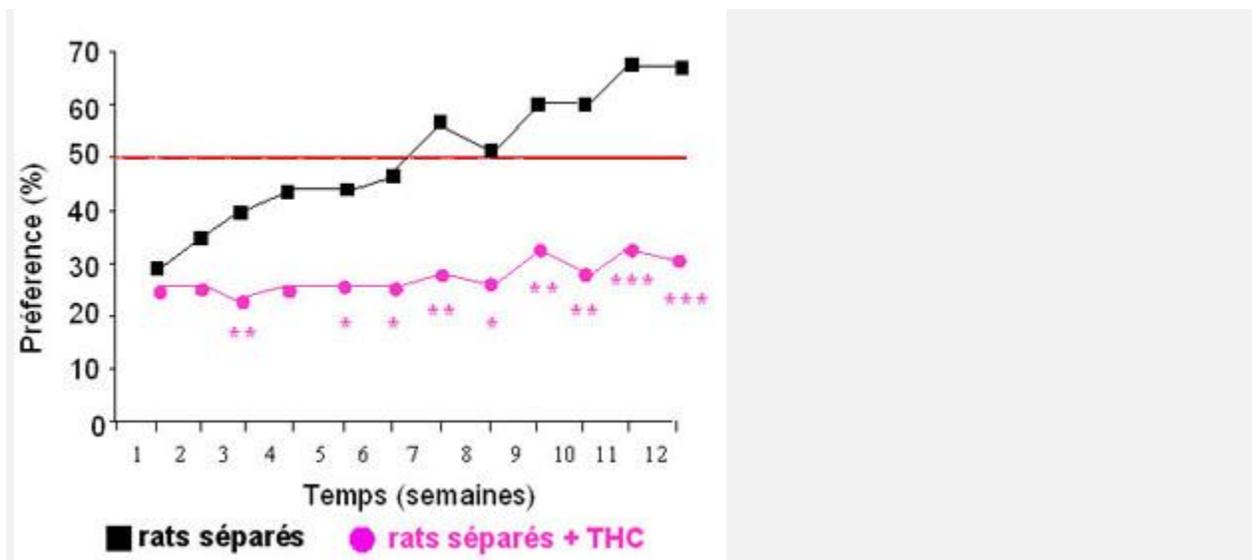
**Injections of THC, the active principle of cannabis, eliminate dependence on opiates (morphine, heroin) in rats deprived of their mothers at birth. This has been shown by a study carried out by Valérie Daugé and her team at the Laboratory for Physiopathology of Diseases of the Central Nervous System (UPMC / CNRS / INSERM) in the journal *Neuropsychopharmacology*. The findings could lead to therapeutic alternatives to existing substitution treatments.**

In order to study psychiatric disorders, neurobiologists use animal models, especially maternal deprivation models. Depriving rats of their mothers for several hours a day after their birth leads to a lack of care and to early stress. The lack of care, which takes place during a period of intense neuronal development, is liable to cause lasting brain dysfunction. Valérie Daugé's team at the Laboratory for Physiopathology of Diseases of the Central Nervous System (UPMC / CNRS / Inserm) analyzed the effects of maternal deprivation combined with injections of tetrahydrocannabinol, or THC, the main active principle in cannabis, on behavior with regard to opiates.

Previously, Daugé and her colleagues had shown that rats deprived of their mothers at birth become hypersensitive to the rewarding effect of morphine and heroin (substances belonging to the opiate family), and rapidly become dependent. In addition, there is a correlation between such behavioral disturbances linked to dependence, and hypoactivity of the enkephalinergic system(1), the endogenous opioid system.

To these rats, placed under stress from birth, the researchers intermittently administered increasingly high doses of THC (5 or 10 mg/kg) during the period corresponding to their adolescence (between 35 and 48 days after birth). By measuring their consumption of morphine in adulthood, they observed that, unlike results previously obtained, the rats no longer developed typical morphine-dependent behavior. Moreover, biochemical and molecular biological data corroborate these findings. In the striatum, a region of the brain involved in drug dependence, the production of endogenous enkephalins was restored under THC, whereas it diminished in rats stressed from birth which had not received THC.

Such animal models are validated for understanding the neurobiological and behavioral effects of postnatal conditions in humans. In this context, the findings point to the development of new treatments that could relieve withdrawal effects and suppress drug dependence.



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Study of oral morphine (25 mg/L) self-administration behavior in the maternal deprivation model. Deprived rats progressively increased their preference for the bottle of morphine, whereas deprived rats treated with THC did not develop such escalation behavior.

\*P<0.05, \*\*P<0.01, \*\*\*P<0.001 vs morphine group.

**Notes:**

1] The enkephalinergic system produces endogenous enkephalins, which are neurotransmitters that bind to the same receptors as opiates and inhibit pain messages to the brain.

**References:**

Adolescent Exposure to Chronic Delta-9-Tetrahydrocannabinol Blocks Opiate Dependence in Maternally Deprived Rats - Lydie J. Morel, Bruno Giros and Valérie Daugé. *Neuropsychopharmacology* 24 June 2009, PMID: 19553915.