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EFFECT OF IN VIVO TREATMENT WITH DELTA9-THC ON MICE ADRENAL GLAND

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Introduction: The efficacy of antidepressants has been linked in part to their ability to reduce activity of the hypothalamic-pituitary-adrenal (HPA) axis; however, the mechanism by which antidepressants regulate the HPA axis is largely unknown. Recent research has demonstrated that endocannabinoids can regulate the HPA axis and exhibit antidepressant potential.

Aim: The purpose of this study was therefore to evaluate the effect of chronic administration of delta-9-tetrahydrocannabinol (delta9-THC) on the adrenal gland of mice.

Methods: Delta9-THC (10 mg/kg, 1 THC:1 chremophor:18 saline) or vehicle (CT, 1 chremophor:18 saline) was administered i.p. for 10 days to C57Bl6 mice aged 15 weeks. At the end of the study rats were placed in metabolic cages. Noradrenaline (NA) and adrenaline (AD) levels in samples and tissues were evaluated by HPLC-ED. Statistical analysis was done by ANOVA followed by Student's t test. Results are presented as mean±SEM.

Results: Treatment with delta9-THC did not produce changes in mice weight (CT: 25±1; delta9-THC: 24±1 g, n=5-6) but produced a significant reduction in adrenal gland weight (CT: 1.4±0.2; delta9-THC: 0.6±0.1* mg, n=5-6, *P 0.01). However, treatment with delta9-THC did not produce significant changes in NA and AD adrenal content (NA: 7.5±2.1, 5.3±0.6; AD: 14.1±1.1, 11.1±2.1 nmol, CT and delta9-THC respectively, n=5-6) or in NA and AD urine levels (NA: 0.88±0.06, 1.18±0.17; AD: 0.64±0.07, 0.81±0.09 nmol/24h, CT and delta9-THC respectively, n=5-6).

Conclusion: Chronic treatment with delta9-THC reduces adrenal gland weight in mice. These results suggest that endocannabinoids may act directly at the adrenal gland to regulate the HPA axis.