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Information and Resources

Nutritional Supplements in the Treatment (Secondary Prevention) of Chronic Cocaine Dependence

Category: Basic Science

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Background: Illicit drug use has become increasingly prevalent in Jamaica as a result of the spill-over market created by drug trafficking. There is currently no medical treatment for cocaine addiction. A formulation of nutritional supplements has been developed and patented to reduce the craving. The objective of this study was to determine the effectiveness of consumption of nutritional supplements in the treatment of rats chronically treated with cocaine through the use of conditioned place preference (CPP) behavior and lipid peroxidation analysis.

Methods: An animal model of cocaine dependence was established through a biased CPP paradigm with the use of a CPP box, using a modification of the method described by Martin et al. (2000). The preferred compartment (black, dark chamber) was paired with the vehicle (saline), and the nonpreferred compartment (white, well-lit chamber) was paired with cocaine (20 mg/kg). The effects of administration of nutritional supplements on dependence was evaluated using the CPP box where the time spent in each of the two compartments was evaluated out of a total of 18 minutes and compared with various controls over a 3-month period. Animals were sacrificed, and the organs collected and stored for analysis. Lipid peroxidation levels were measured according to the method of Okhawa et al. (1979). Statistical analysis was done using SPSS software (version 16).

Results and Discussion: During acclimatization, in the animal models time spent in the white compartment was 5.98 ± 0.48 minutes. After chronic cocaine exposure, the time spent in this compartment increased more than two-fold to 12.46 ± 0.59 minutes. Treatment of rats chronically exposed to cocaine with the nutritional supplements resulted in a decreased preference for the white compartment over time (6.05 ± 0.18 minutes). Lipid peroxide in the liver, heart, pancreas, spleen, brain, and stomach was not significantly different for normal rats fed normal rat diet and rats chronically exposed to cocaine and treated with nutritional supplements. The group continuously exposed to cocaine and fed normal rat diet showed an overall increase in lipid peroxide level compared to that of the normal control group fed normal rat diet.

Conclusions and Implications: It would appear, based on the CPP, that nutritional supplements may be effective in reducing the craving for cocaine and that this treatment may effectively decrease lipid peroxides resulting from chronic exposure to cocaine.