THE EFFECT OF OXYTOCIN HORMONE IN COCAINE ADDICTED RATS SUFFERING FROM ABSTINENCE SYNDROME

Juan Alberto Padilla. Advisor: Ojeda, David

BACKGROUND
Rehabilitation from a drug addiction is a very difficult process. Withdrawal syndrome forces the patient who is in the process of rehabilitation to go through extreme anxiety that causes them to quit the treatments. Studies suggest that the hormone oxytocin, which is associated with a sense of calmness, is a potential facilitator in the rehabilitation process. Oxytocin is known as the love hormone because of the calming effects attributed to it that helps humans make bonds. The present study aims to test the calming effects of oxytocin in rats addicted to Cocaine.

RESEARCH QUESTION
Can intranasal administration of the oxytocin in rats, during abstinence of Cocaine treatment decrease withdrawal elicited anxiety and thus the craving of the drug?

METHODOLGY

Animal Source
- Sprague Dawley rats were seven days in quarantine in a 12 hour day/night shift.
- Seven days of handling to allow the subjects to habituate to experimental procedures.
- Three days of habituation exposure where all subjects were, intranasally, administered saline.

Habituation Phase

Locomotion
An increase in locomotor activity is found in animals on days 4-6.

Cocaine Phase
- Days 1-5: all rats were injected 10mg/kg of Cocaine diluted in sterile 0.9% saline water.
- Animals were placed in an operant chamber for 30 minutes. Locomotor activity was monitored.

RESULTS

Data Recollection Phase
- Elevated Plus Maze test for 5 minutes and behaviors were recorded.

Elevated Plus Maze (EPM)

Anxiety levels were determined by time in arms.

Operant Chamber

All rats were then placed in the operant chamber for thirty minutes. Activity was recorded.

Operant Chamber

SALINE

OXYTOCIN

Elevated Plus Maze (EPM)

Open arms: less anxiety

Closed arms: more anxiety

EPM Test
Data shows evidence of different levels of anxiety between the groups.

Average on open arms: group of oxytocin was 22 sec. more than group of saline.

Anxiety Levels

EPM Test

Effect of Oxytocin on Locomotor Activity in Cocaine Addicted Rats

CONCLUSIONS
- Oxytocin treatment did not affect locomotor activity of Cocaine treated animals on day 6.
- Oxytocin made experimental animals less anxious when compared to controls in the EPM, although it did not reach statistical significance in the t-test.
- We suggest oxytocin has calming effects on high levels of anxiety.

FUTURE RESEARCH
- Incorporate more subjects into each group.
- Add another dose of Oxytocin.
- Study the effect of Oxytocin interacting with other hormones and chemicals such as Tetrahydrocannabinol or Serotonin.
- Test how addictive Oxytocin could be.

ACKNOWLEDGEMENTS
I am grateful to the University of Puerto Rico for allowing me to be in the laboratory and the Neuro ID Program. I thank Dr. Maldonado (PhD) for accepting me in her laboratory and helping me with all my work, Dr. Keyla Soto and Myrna Gandia (teachers) for their guidance and Dr. Wickensorn (graduate student) Sol Forseca and David Ojeda (under-graduate students) for all of their help, and for allowing me to be an active part of their study.

BIBLIOGRAPHY