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Memory Reconsolidation and Alcohol Use Disorder: Intravenous Infusion of Ketamine to Alleviate Addictive Symptoms in Alcohol Use Disorder Diagnoses

Yasaswi Veera
Virginia Commonwealth University

Memory Reconsolidation and Alcohol Use Disorder: Investigation of the Ability of Ketamine to Alleviate Addictive Symptoms in Alcoholic Patients

Yasaswi Veera
Undergraduate Student, Honors College
veeray@vcu.edu

INTRODUCTION

- Substance use disorder is a significant issue in the United States, with nearly 100,000 deaths and $200 billion healthcare/criminal justice expenditure annually
- Addictions are the most severe form of substance use disorder
- Addictions are formed through repeated cue-exposures and strengthening of neural connections between stimulus and response
- Substance use disorders have a higher rate of relapse compared to other mental illnesses due to the neurotransmitters/substances involved
- Current treatments involve reconditioning the brain to dissociate alcohol with its transient effects
- Ketamine was recently proposed as a treatment method due to its anesthetic properties

HYPOTHESIS

It was hypothesized that ketamine would produce longer-lasting effects especially when administered during the reconsolidation period of memory retrieval.

METHODS

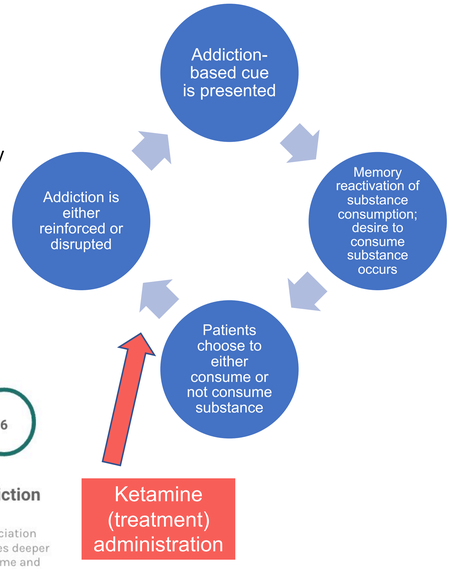
A literature review was conducted using sources from ScienceDirect and Pubmed in order to gather information on the process of addiction formation, methods and efficiency of current treatments, background on ketamine infusion, and information on memory retrieval and the following reconsolidation period.

Administering treatment **DURING** reconsolidation period post-memory retrieval provides **longer lasting results**.

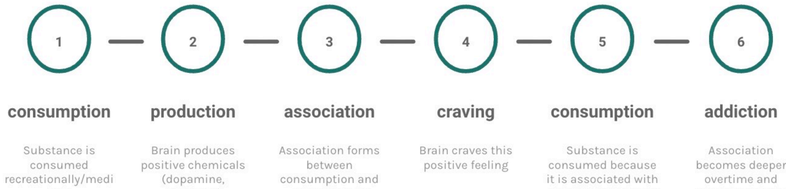
RESULTS

- Self-reported studies investigating addictive drinking habits found that there was a reduction in drinking behavior in groups that were presented with disgust-inducing cues upon alcohol-stimulation
- EMDR therapy presents itself as an effective treatment for PTSD due to its ability to take advantage of the memory reconsolidation period
- Ketamine administration resulted in a significant reduction in drinking and no significant reduction in control groups

Enhanced Treatment Administration:



Addiction Formation Process:



KEYWORDS

Ketamine; AUD; memory reconsolidation; addiction; substance abuse; memory retrieval; MDD

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CONCLUSION

Upon review of available research from investigated sources, two major conclusions can be drawn. Due to its anesthetic and memory-loss inducing properties, ketamine has the potential to interfere with the addiction formation process, which is heavily reliant on memory retention. Additionally, in reference to treatments such as EMDR for PTSD and MDD, taking advantage of the memory reconsolidation period upon cue-induced memory retrieval would be a resourceful approach to dissociate MMM connections and related neural pathways.

While some studies claim that this reduction in drinking behavior can be due to the Hawthorne Effect (increased drinking awareness), additional research and repeated trials are required to form substantial conclusions. Lack of research/trails limit the ability to generalize results across all populations and all substances.

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