May 2nd, 12:00 AM

**Impact of Rotenone Treatment on Respiration and Swallowing Rate in Drinking Rats**

Taylor Good  
*Rowan University*

Shivam Patel  
*Rowan University*

Nicholas Zanghi  
*Rowan University*

Francois Gould  
*Rowan University*

Follow this and additional works at: [https://rdw.rowan.edu/stratford_research_day](https://rdw.rowan.edu/stratford_research_day)

Part of the [Medicine and Health Sciences Commons](https://rdw.rowan.edu/stratford_research_day)

Let us know how access to this document benefits you - share your thoughts on our feedback form.

Good, Taylor; Patel, Shivam; Zanghi, Nicholas; and Gould, Francois, "Impact of Rotenone Treatment on Respiration and Swallowing Rate in Drinking Rats" (2024). *Rowan-Virtua Research Day*. 15.

[https://rdw.rowan.edu/stratford_research_day/2024/may2/15](https://rdw.rowan.edu/stratford_research_day/2024/may2/15)

This Poster is brought to you for free and open access by the Conferences, Events, and Symposia at Rowan Digital Works. It has been accepted for inclusion in Rowan-Virtua Research Day by an authorized administrator of Rowan Digital Works.
Impact of Rotenone Treatment on Respiration and Swallowing Rate in Drinking Rats

Taylor Good OMS-II, Shivam Patel OMS-II, Nicholas Zanghi OMS-II, François D. H. Gould
Department of Cell Biology and Neuroscience, Rowan University, Virtua Health College of Medicine and Life Sciences

Introduction:
Parkinson’s disease is a neurodegenerative disorder known to cause dysphagia, the major contributor to mortality via aspiration pneumonia. The neurological basis of swallowing dysfunction in Parkinson patients is poorly understood. To explore the mechanisms of swallowing dysfunction, we studied the impact of rotenone treatment on respiration rate and swallowing rate in liquid-drinking rats.

Hypothesis: Rotenone treatment will cause a decrease in respiratory and swallowing rate compared to untreated liquid-drinking rats.

Materials and Methods:
Experiment timeline:
Six adult Lewis rats received 2.75mg/kg/day IP rotenone for 16 days. Liquid drinking tests were recorded on day 0 (prior to first injection) and on day 4, 7, 10, and 16. On day 16 the rats were euthanized, and brains perfused for immunofluorescent staining of the dorsolateral striatum.

Procedures:
Data Collection:
Animals were recorded with high speed (200fps) video fluoroscopy during barium-infused liquid drinking. The number of swallows and the number of breaths in a 10 second period of continuous drinking were scored.

Statistics:
The swallow and respiration rate was analyzed using type 3 analysis of variance with Satterthwaite’s method.

Results:
Respiration rate while drinking decreases in animals receiving rotenone injections (p<0.05).

Swallowing rate while drinking does not change in animals receiving rotenone injections (p>0.05).

Rotenone treated rats have significant reduction in tyrosine hydroxylase (TH) immunofluorescence.

Discussion:
Hypothesis: Partially rejected.
Rotenone treatment does lead to a decrease in respiration rate in liquid drinking rats. However, rotenone treatment does not impact swallowing rate in liquid drinking rats.

Conclusion:
Rotenone induced parkinsonian treatment has differential impacts on different brainstem mediated processes, swallowing and respiration. Thus, swallow-respiration coordination is likely impacted in these animals, potentially increasing risk of airway protection failure.

References: