

Session/Poster#

Presenter

B32

Natalie Cipriano

College of Medicine Student

Advisor(s): Dr. Mark Stewart, Department of Physiology and Pharmacology

Contributions of baroreceptor reflex activity to the brainstem depolarization associated with respiratory arrest after airway occlusion.

Sudden Death in Epilepsy (SUDEP) is a poorly understood phenomenon that occurs most frequently in epileptic patients with generalized tonic-clonic seizures. We investigated the contributions of baroreceptor reflex activity to the brainstem depolarizing response that occurs in association with respiratory arrest after airway occlusion.

Rats were anesthetized using urethane, and a tracheal T-tube was placed. The airway was occluded for 2 minutes after respiratory arrest. Air boluses were injected into the tracheal tube for resuscitation. We performed an initial occlusion/resuscitation with recordings to establish whether the typical brainstem depolarization was evoked. Then, the glossopharyngeal and vagus nerves were cut bilaterally. The experiment was repeated, and the brainstem responses pre- and post-nerve transection were compared.

The average depolarizing response duration was longer in the pre-cut period (57.6 s) compared to the post-cut period (32.6 s; $p = 0.03$). Whereas 4/5 animals showed a decreased duration of the depolarization, pairwise comparison did not reach statistical significance ($p = 0.1$).

Our results show a shorter brainstem depolarizing response after cutting cranial nerves IX and X compared to the burst duration with intact nerves. This indicates that the baroreceptor reflex does contribute to brainstem activity seen after respiratory arrest due to airway occlusion.