Title – Electrocardiographic Effects of Acute Airway Obstruction
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Mentor Email – Ben Kalu, M.D. Director of Biomedical Sciences Assistant Professor of Biology (bnkalu@liberty.edu)
Student name(s) and email(s) – June Gill (Joseph) PARK (jpark63@liberty.edu)
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Abstract: Acute bronchitis affected 44 of 1000 adults annually, and 82% of episodes occurred in fall or winter. In comparison, approximately 66 million cases of the common cold, and 31 million cases of other acute upper respiratory tract infections occurred annually. The casualty rate indicates that children are more venerable than adults. Asthma is one of the acute bronchitis that causes inflammation and hard time breathing out. Also, people diagnosed with asthma as adults seem to have an increased risk of developing heart disease and stroke. This study aims to evaluate the cardiac activity of the stimulated acute airway obstructions.

A total of 15 healthy graduate students in Biomedical Science participated. PowerLab device by ADinstruments was used to measure and control the amount of breathing air flow, and to collect electrocardiographic (ECG) and the other cardiac variabilities. The experimental categories are baseline without obstruction, 77% and 94% of airway obstructions. The simulation of acute airway obstruction was performed for 5 mins for each experimental category, and ECG was recorded accordingly. For the statistical analysis, paired t-test and single factor ANOVA comparing three variables (F critical=3.2) were used.

The LF power (nu) had significantly increased with 77% and 94% of airway-obstructions ($mean^{77\%}$= 34.1 +/- 22.1; $mean^{94\%}$=63.9 +/- 26.2; $F[1,15]=17.2$; $p < .05$). HF power (nu) had significantly decreased with 94% of airway-obstruction ($mean^{94\%}$=34.6 +/- 24.3; $F[1,15]=13.9$; $p < .05$). The LF/HF ratio had significantly increased with 94% of airway-obstruction ($mean^{94\%}$=3.3 +/- 2.6; $F[1,15]=7.1$; $p < .05$). P and R-Amp had significantly increased with 94% of airway-obstruction ($mean^{P\text{-}Amp}$= 46.0 +/- 34.3; $mean^{Q\text{-}Amp}$=198.6 +/- 56.5; $F[1,15]^{P\text{-}Amp}=3.9$; $F[1,15]^{R\text{-}Amp}=13.2$; $p < .05$). S-Amp had significantly decreased with 94% of airway-obstruction ($mean^{94\%}$= -85.3 +/- 50.5; $F[1,15]=4.2$; $p < .05$). T-Amp showed significant p-value ($p < .05$) in ANOVA.

Acute airway obstruction significantly exerts a strain on cardiac hemodynamic functions, as shown in the Δ ECG waves, and the autonomic control of the heart's shown by increased LF power(nu), LF/HF ratio, and decreased HF power(nu). Our data suggests that acute airway

obstruction; for example, asthma or bronchitis. In a patient with a pre-existing cardiac disease will increase myocardial strain and potentially lead to acute heart failure.