Differences in Pharmaceutical vs Exercise Induced Ischemia: Implications for Development of Ischemic Models

Jake Bergquist, u6010393

April 13, 2019

Introduction

The detection of cardiac ischemia has been a topic of active research for decades as cardiac ischemia is a predictor of several potentially fatal heart conditions such as coronary artery disease, coronary artery dissection and others.[1, 2, 3, 4] Given the commonality of ischemia between many different heart conditions, its detection and diagnosis is a high impact area of medical research. Cardiac ischemia occures when the supply of blood to a region of the heart is outpaced by the demand for nutrients such as oxygen. This can occur when a coronary artery become blocked partially or fully, or when some other change in flow occurs, or when the rate of metabolism increases past the ability of the coronary arteries to supply sufficient blood. The resulting lack of oxygen to the cardiac tissue leads the cardiomyocytes to become ischemic. If the ischemia does not presist its effects on the heart are reversible, thus it is critically important to diagnose and treat the ischemia quickly. The most predominant feature of ischemia that can be detected with non invasive methodology is changes in the ST segment of the ECG. When cardiomyocytes become ischemic [5]

Background

Methods

Results

Discussion

References

[1] B. Safdar, P. Ong, and P. G. Camici, "Identifying Myocardial Ischemia due to Coronary Microvascular Dysfunction in the Emergency Department: Introducing a New Paradigm in Acute Chest Pain Evaluation," *Clinical Therapeutics*, pp. 1–11, 2018. [Online]. Available: https://linkinghub.elsevier.com/retrieve/pii/S0149291818304612

[2] L. Jespersen, S. Z. Abildstrøm, A. Hvelplund, and E. Prescott, "Persistent angina: highly prevalent and associated with long-term anxiety, depression, low physical functioning, and quality of life in stable angina pectoris," *Clinical Research in Cardiology*, vol. 102, no. 8, pp. 571–581, 2013. [Online]. Available: https://doi.org/10.1007/s00392-013-0568-z

[3] B. M. C. Noel, P. C. J., W. M. Norine, F. J. L., C. P. G., C. W. M., C. J. Austin, C. L. S., C. Filippo, D. C. Marcelo, D. P. S., G. Z. S., G. Paul, H. E. M., H. Ahmed, H. J. A., H. J. S., I. Erin, K. Ruth, L. G. N., L. Peter, L. Joao, M. Puja, D.-N. Patrice, O. Michelle, P. G. D., Q. A. A., R. Harmony, R. British, S. George, T. Viviany, W. Janet, and W. Nanette, "Ischemia and No Obstructive Coronary Artery Disease (INOCA)," *Circulation*, vol. 135, no. 11, pp. 1075–1092, Mar. 2017. [Online]. Available: https://doi.org/10.1161/CIRCULATIONAHA.116.024534

[4] L. Jespersen, A. Hvelplund, S. Z. Abildstrøm, F. Pedersen, S. Galatius, J. K. Madsen, E. Jørgensen, H. Kelbæk, and E. Prescott, "Stable angina pectoris with no obstructive coronary artery disease is associated with increased risks of major adverse cardiovascular events," *European Heart Journal*, vol. 33, no. 6, pp. 734–744, Mar. 2012. [Online]. Available: http://dx.doi.org/10.1093/eurheartj/ehr331

[5] M. Janse, "Electrophysiology and electrocardiology of acute myocardial ischemia," vol. Suppl, pp. 46A–52A, 1986.