**INCREASED MORTALITY RISK DURING GRAVITATIONAL TRANSITION IN HEART DISEASE MODEL**

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Objectives: To examine the heart rate variability and QT during gravitational transition in heart disease model.

Background: Abruptly change in autonomic nervous activity on the heart during gravitational transition is a reflex maintaining homeostasis due to hemodynamic alteration. However, change in autonomic nervous response in a heart disease patient who has high sympathetic activity has never been identified.

Methods: Electrocardiogram was continuously monitored in doxorubicin-induced cardiomypathic (CM) guinea pig during gravitational transition in parabolic flight (provided by Japan Aerospace Exploration Agency) included three consecutive phases; normogravity, hypergravity, and microgravity. Time domain heart rate variability indices (standard deviation of the intervals (RRSD)), corrected QT interval (QTc) and short-term QT variability (STVQT) were then evaluated.

Results: Doxorubicin induced cardiomyopathy with decreased RRSD and prolonged QTc interval indicating high risk of arrhythmia. Further decreased RRSD during hypergravity in CM points to an enhancement of arrhythmia risk in the CM heart. In addition, a significant increase in STVQT during microgravity observed only in healthy control, but not in CM, implies a possibility of decreasing sympathetic stimulation in the CM heart. Surprisingly, prolonged QTc interval in CM group observed in normogravity was reduced to be close to that of control during microgravity.

Conclusion: Our study suggests that gravitational transition suddenly increases risk of mortality due to arrhythmia in heart disease model during the transition from normogravity to hypergravity. In contrast, the reduction of QTc interval in CM group suggests a possible in decreased arrhythmia risk in microgravity.