Additional exercise did not alter the blood glucose or insulin concentrations compared to REST. There were no significant associations between measurements of O2C, O2C or O2C and glucose or insulin at baseline or the post-glucose AUC.

**CONCLUSION:** This study is the first to report the temporal response of serum O2C within 2 hours of glucose ingestion. The results reveal that neither a bolus dose of glucose, nor exercise preceding the glucose drink altered serum O2C, O2C or O2C in sedentary, overweight young men. Additionally, there was no relationship between postprandial changes in serum O2C, O2C or O2C with glucose or insulin during either trial. Therefore, O2C does not appear to play a role in short-term glycemic control in overweight but healthy young men.

Supported by the University of Oklahoma Research Council.

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**Recent work suggests that glucose-stimulated insulin secretion (GSIS) should be adjusted for both skeletal muscle and hepatic insulin resistance to depict β-cell function (i.e. disposition index). However, adipose tissue insulin resistance needs to be accounted for since elevated free fatty acids (FFA) impair β-cell function. PURPOSE: To characterize and validate adipose β-cell function adjusted for skeletal muscle and hepatic insulin resistance, and test the effects of a 7-day exercise intervention on β-cell function. METHODS: Forty-four subjects (29 F; 59.6±1.3 y; 31.3±0.7 kg/m2) underwent a standard 75g OGTT to test the effects of a 7-day exercise intervention on glucose, nor exercise preceding the glucose drink altered serum O2C, O2C or O2C in sedentary, overweight young men. Additionally, there was no relationship between postprandial changes in serum O2C, O2C or O2C with glucose or insulin during either trial. Therefore, O2C does not appear to play a role in short-term glycemic control in overweight but healthy young men.

Supported by the University of Oklahoma Research Council.

**PURPOSE:** To test the hypothesis that the CB contribute to blood glucose regulation during exercise. METHODS: Six recreationally trained men completed two randomized exercise sessions at 65% VO2max for up to 2 hours. One session was performed with an IV infusion of dopamine (2 μg/kg/min) (DB) to blunt CB chemosensitivities, and the other with an IV infusion of saline (SAL). Blood was drawn for blood glucose and counter-regulatory hormones at baseline, resting infusion, and every 10 minutes during exercise. A hypoventilatory response (HVR) test was performed 15 minutes following exercise, with a continuous infusion of DA or SAL. Subjects were classified as being responders (RS) if their HVR was lower during DA vs. SAL, and non-responders (NR) if their HVR during DA was equal to or greater than their HVR during SAL.

**RESULTS:** Three subjects were classified as RS as DA reduced their HVR from 2.14 ± 0.2 to 1.03 ± 0.3 mL/min%O2. Two RS were unable to complete the 2 hours of exercise during DA (mean 90 ± 17.3 minutes) while all RS completed the SAL session. In RS, blood glucose during DA had a greater change from baseline vs. SAL (condition main effect: 0.9 ± 8.4 vs. 23.2 ± 9.7, P < 0.03) and cortisol during DA had a smaller change from baseline vs. SAL (condition main effect: -14.0 ± 3.3 vs. -5.0 ± 3.1%, P < 0.03) and cortisol during DA in the RS group. Meanwhile, all three NR completed both DA and SAL sessions. In the NR group, there were no differences between DA and SAL for the percent change from baseline for growth hormone, glucagon, epinephrine, and norepinephrine in the RS group. Meanwhile, all three NR completed both DA and SAL sessions. In the NR group, there were no differences between DA and SAL for the percent change from baseline blood glucose, growth hormone, glucagon, cortisol, epinephrine, and norepinephrine. CONCLUSIONS: DA administered at 2 μg/kg/min was not effective in blunting CB chemosensitivities in all subjects. However, when the HVR is effectively blunted by DA, the CB appear to contribute to blood glucose regulation during prolonged exercise, possibly by diminishing the cortisol response to exercise.

**Board #46**

**May 28, 3:30 PM - 5:00 PM**

**Hyperoxia Accelerates Post-exercise Glycogen Storage In Human Skeletal Muscle**

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**PURPOSE:** Hyperoxia is known to increase free radical production in vivo. Since oxidative stress has been found to be causally associated with training adaptation, we hypothesized that hyperoxia can increase the rate of post-exercise glycogen storage in human skeletal muscle. METHODS: In the study, 14 young male subjects were balanced with baseline maximal oxygen consumption (VO2max) into two groups: Normoxia (aged 23.1±1.0 years) and Hyperoxia (aged 22.8±0.6 years), who performed a 1-h cycling at 75% VO2max and recovered under 21% or 60% oxygen for 90 min after high carbohydrate meal. Tissue glycogen content (per kg body weight). Muscle biopsies from deep vastus lateralis were collected immediately after exercise and 90 min after meal to determine the rate of glycogen storage. RESULTS: Our results showed that hyperoxia resulted in a greater increase in 8-iso-prostaglandin F2α and decreased reduced form of glutathione in plasma compared to normoxia treatment. Despite no difference in muscle mRNA for IL-6, GLUT4 and PGC-1α was detected between two treatment groups, hyperoxia increased plasma IL-6 above normoxic control during recovery. This condition accelerated the rate of glycogen storage by 4.4 fold (from...