Cyclic Hypobaric Hypoxia Improves Markers of Glucose Metabolism in Middle-Aged Men

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Purpose: To test the hypothesis that markers of glucose metabolism would change with CVAC CHH, two groups of middle-aged men were exposed to 10 weeks (40 min/day, 3 day/week) of either CHH or sham (SH) sessions.

Methods: CHH subjects (age: 48±6, weight: 86±12 kg, BMI: 27.1±3, n=11) experienced cyclic pressures simulating altitudes ranging from sea level to 3048 m (week 1) and progressing to 6096 m (by week 5 through week 10). SH subjects (age: 50±4, weight: 89±15 kg, BMI: 27.5±3, n=10) were exposed to slowly-fluctuating pressures up to 607 m (all subjects blinded to elevation). Physical function and blood markers of glucose metabolism were measured at baseline, 3, 6, and 10 weeks.

Results: Two CHH subjects were dropped from analysis for failure to progress past 3048 m (CHH: n=9). Weight and physical activity remained stable for both groups. There was a group-by-time interaction in fasting glucose (CHH: 96±9 to 91±7 mg/dL, SH: 94±7 to 97±9 mg/dL, p<0.05). Reduction in plasma glucose response to oral glucose tolerance test [area under the curve] was greater in CHH compared to SH after 10 weeks of exposure (p<0.03). Neither group experienced changes in fasting insulin, insulin response during the OGTT, or changes in a timed walk test.

Conclusion: Ten weeks of CVAC CHH exposure improves markers of glucose metabolism in middle-aged men at risk for metabolic syndrome.

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