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PHYSIOLOGICAL DIFFERENCES BEFORE, DURING AND AFTER HYPOXIC EXERCISE BETWEEN AFRICAN-AMERICAN AND CAUCASIAN MALES (69 pp.)

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INTRODUCTION: Hypoxia is a potent stimulus that induces neuropsychological and physical impairments in humans. It is documented that ethnic differences exists across various physiological parameters. There appears to be a varying metabolic response across ethnicities, specifically African-Americans and Caucasians. PURPOSE: To further elucidate physiological and cognitive performance differences between African-American (AA) and Caucasian individuals (CAU) before, during or after hypoxic and normoxic exercise. METHODS: Twelve college aged (18-25) apparently healthy African-American (six volunteers) and Caucasian (six subjects) males took part in two trials consisting of normobaric normoxia and normobaric hypoxia (12% oxygen). Each subject cycled at 50% of their altitude adjusted VO2max (-26% of normoxia VO2max) for one hour after a two-hour baseline. Subjects were monitored for cerebral and arterial O2 saturation, as well as the Trail Making Test A and B (TMT) psychomotor performance. RESULTS: Arterial saturation proved to be significantly higher in AA (86.0±4.7) compared to CAU (79.5±4.8) during the first 60 minutes of exposure to hypoxia at rest ($p=0.039$), but not during exercise. Cerebral oxygenation to the left frontal lobe was decreased near the conclusion and 30 minutes after normoxic exercise.

TMT B data revealed that CAU (79±12.7) had faster scores than the AA subjects (98±25.1) at all time points and was significantly different at the 115 minute time point of the hypoxic trial ($p=0.024$). Conclusion: Data suggests that before, during and after normobaric normoxia and hypoxia trial there is a differential response between AA and CAU in regards to arterial and cerebral oxygenation and psychomotor tests.