

Effects of antioxidants on cerebrovascular hemodynamics during moderate and high intensity exercise

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Category: Doctoral

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ABSTRACT

It has been identified that central reactive oxygen species (ROS) scavenge nitric oxide (NO) and increase central sympathetic nerve activity (SNA) outflow. During dynamic exercise increases in ROS have been measured across the brain. We tested the hypothesis that during dynamic leg cycling exercise, antioxidants would increase middle cerebral artery blood velocity (MCAv) and cerebrovascular conductance (CVCi). Five healthy subjects performed back supported semi-recumbent dynamic leg cycling with antioxidant cocktail (AxT) and without AxT (placebo - PI). Arterial pressures (AP) and MCAv were measured continuously during moderate intensity dynamic leg exercise at heart rates (HR) of 120 bpm (e120) and heavy intensity at HR of 150 bpm (e150). No differences in AP were observed between PI and Axt at e120 and e150 ($P \geq 0.50$). MCAv during AxT at e120 and e150 was increased above PI ($P=0.06$). However, the calculated CVCi was significantly greater at e120 and e150 between CT and PI ($P=0.05$). From these data we conclude that Axt scavenged exercise induced central ROS resulting in increased central NO induced cerebrovascular vasodilation during exercise.