DOES RACE MATTER? THE ROLE OF RACE IN THE BLOOD LACTATE LEVELS OF SUB-ELITE RUNNERS.

Nicole Azuogu: Cardiovascular Research Laboratory, The University of Texas at Arlington, Arlington, TX;

Abstract

The purpose of this study was to investigate the variance in exercise blood lactate accumulation between African Americans and Caucasians that were well trained.

Methods

Five African American Males (age 22 ± 1.7) and five Caucasian Males (age 22 ± 4.4) from the University of Texas at Arlington volunteered to participate in this study.

Introduction

• Previous literature suggests that plasma lactate levels in elite distance runners are less in black African runners in comparison to Caucasian runners.

• Blood lactate is a by-product of anaerobic metabolism of glycogen.

• Glycolysis at high intensity exercise increases CO₂ levels which in turn trigger an increase in ventilation and heart rate. This system is short lived and fatigue sets in quickly due to glycogen depletion, a decrease in pH due to excess H⁺ ions, and many other factors

• Lower Lactate levels in skeletal muscle will delay the onset of fatigue results in delayed fatigue.

• Each subject performed a graded exercise test on the treadmill with increasing speed and elevation until exhaustion. During each test heart rate (HR) and rate of perceived exertion (RPE) were recorded along with the maximal values measured by the metabolic cart, relative maximal oxygen consumption (VO₂max) and minute ventilation (Vₑ)

• Blood Lactate was measured using blood drawn by a finger prick before and after exercise using the Accusport Lactate Analyzer

Results (cont’d)

The post exercise blood lactate was (AA: 12.5 ± 93 mmol/L ; C 16.3 + 2.2 mmol/L) which was significantly different (p = 0.04). The net accumulation variance between African Americans and Caucasians was also significantly different (p = 0.008).

Conclusions

Few studies have been completed to clarify the physiological differences between African and Caucasian runners. The findings of this study indicate that blood lactate levels are lower in African Americans, despite comparable VO₂ max, Vₑ and Heart rate max. Due to the complex nature of lactate kinetics, it is difficult to clarify the relationship between blood lactate and ethnicity. A consideration for future studies would be to investigate the disappearance rate of blood lactate in African Americans and Caucasians, as well as the physiological differences responsible for blood lactate variance between African Americans and Caucasians.