

The Effect of Training Status on Glycemic Control in a Collegiate Population

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PURPOSE: To measure the differences in blood glucose regulation following an oral glucose tolerance test (OGTT) between Division II aerobic and anaerobic athletes and a comparable sedentary population.

METHODS: Aerobically trained (n=6), anaerobically trained (n=6) and sedentary (n= 6) volunteers participated in the study. After completing a 12-hour fast, 10-min incremental blood glucose (BG) measurements were recorded over 80-min following consumption of a 300ml dextrose beverage (dosed 1.5g/kg of body mass). The YMCA Cycle Ergometer protocol was utilized to estimate VO_{2max} .

RESULTS: Aerobic athletes displayed a significantly smaller ($p<0.05$) area under the glucose curve (AUGC) when compared to anaerobic and sedentary groups. No significant differences for glycemic control were present between the anaerobic and sedentary groups. A significant positive correlation ($r = 0.75$) was shown between BMI and AUGC ($p<0.01$). A moderate, but non-significant negative correlation ($r = -0.463$) between estimated VO_{2max} and AUGC was observed.

Subjects	Mass (kg)	Height (cm)	BMI (kg/m^2)	Body Fat (%)	AUGC	VO_{2MAX}
Aerobic	61.16 ± 9.87	67.42 ± 4.39	20.72 ± 1.15	12.48 ± 6.02	8786.67 ± 1066.73	49.40 ± 7.12
Anaerobic	79.39 ± 20.95	67.50 ± 4.93	26.57 ± 3.25	20.97 ± 3.27	10937.50 ± 1042.25	38.24 ± 6.31
Sedentary	76.36 ± 22.82	68.21 ± 4.72	24.93 ± 4.21	21.78 ± 5.26	10630.83 ± 1192.83	31.31 ± 5.32

Data are mean ± S.D. AUGC expressed in arbitrary units (a.u.).

CONCLUSION: Aerobic athletes displayed a significantly more efficient glucose metabolism, and an aerobic-based training program with goals to improve BMI may serve most beneficial for individuals with Type 2 Diabetes Mellitus or pre-diabetic symptoms.