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ACUTE EFFECT OF AEROBIC EXERCISE: RELATIONSHIP WITH POST PRADIAL GLYCEMIC CONTROL

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INTRODUCTION

One of these strategies to attenuate the postprandial glycemic peak can be physical exercise, since a single exercise session is enough to promote an increase in glucose uptake by the cell.

GOAL

To analyze the acute effect of aerobic training on postprandial glycemic control in healthy subjects.

METHODOLOGY

15 sedentary men (24.9 ± 1.2 years; BMI 21.6 ± 2.82; HbA1c 5.5 ± 0.5%; fasting glucose 81.1 ± 9.1 mg/dL) underwent two interventions, randomly: (i) fasted interval aerobic exercise (EAI; 10 min warm-up, 7 blocks of 3 min 65-75% HRmax and 2 min 85-95% HRmax, 5 min cool down); (ii) control (CON; absolute rest for the same exercise time). All subjects attended the laboratory after a 10-hour fast. A meal tolerance test (TTR) was performed 30 minutes after exercise, which consisted of a 479 Kcal meal (55% CHO, 30% LIP and 15% PTN). Venous blood was collected to analyze insulin, glucose and C-peptide in both EAI and CON interventions, in which pre-TTR, 10, 20, 30, 60, 90 and 120 minutes post-TTR were collected. The two-way ANOVA repeated measures test was used to assess the interaction between intervention and time.

RESULTS

Blood glucose remained statistically higher compared to pre TTR until 30 min, both for the CON and EAI intervention (Table 1). However, at 30 min, glucose was statistically higher for CON. Insulin also showed statistically higher blood concentrations for CON at 60 and 120 min after TTR. In addition, after 120 min of TTR, insulin is still higher than before for CON, unlike EAI, which returned to baseline values 120 min after TTR. Finally, the C-peptide also has higher concentrations for CON at 30, 60, 90 and 120 min after TTR, and 120 min after the meal are still higher than at rest.

CONCLUSION

Despite blood glucose showing a similar response after TTR, the return to baseline values for those who performed physical exercise is performed with less insulin and C-peptide release.

	Pre	10	20	30	60	90	120
Glucose, mg/dL							
CON	75,3±11,8	96,5±17,1 †	106,9±22,4†	100,3±24,2†	79,2 ±24,4	73,3 ±12,5	72,5 ±6,9
AEI	74,3±6,8	100,1±13,4†	103,7±14,5†	84,8±16,3*†	75,1±14,7	71,5±9,2	70,7±8,1
Insulin, mcUI/mL							
CON	4,6 ±2,2	34,7±25,1†	39,8±18,6†	45,9±20,7†	43,1±24,1†	21,8±15,1†	13,3±8,2†
AEI	5,2±2,3	32,7±16,1†	42,3±17,2†	38,7±14,4†	29,3±21*†	18,5±20,9 †	6,5±2,8 *
Peptídeo-C, ng/mL							
COM	1,32±1,49	2,85±1,64†	3,64±0,75†	5,07±1,75†	4,82±1,95†	3,47±1,91†	2,46±8,2†
AEI	1,13±0,63	2,48±0,97†	3,52±1,13†	4,13±1,28*†	3,61±1,48*†	3,71±1,71*†	1,61±0,64*†

Mean ± SD of glucose, insulin and C-peptide concentration before and after the meal tolerance test for the control (CON) and physical exercise (AEI) interventions. *p≤0.05 for control; †p≤0.05

Table 1.

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