DATA SET 4 EXPLORE 1C LESSON 18



Study 1

Intense exercise has unique effects on both insulin release and its roles in glucoregulation: implications for diabetes

Publish Date: 2002 Journal: Diabetes Authors: Marliss, E.B. and Vranic, M. Link: https://doi.org/10.2337/diabetes.51.2007.s271

Overview of the Study

Scientists wanted to examine the effects of intense exercise on epinephrine and other related variables to better understand how blood glucose is regulated in healthy individuals. They studied this by using healthy, young male subjects before, during, and after workouts.

Scientists wanted to examine the effects of intense exercise on levels of epinephrine in the blood to better understand how blood epinephrine levels change in healthy individuals in response to exercise. Epinephrine, also referred to as adrenaline, is produced and secreted by the adrenal glands in response to stressful situations. Epinephrine triggers the fight-or-flight response in various organs throughout the body, which helps prime the body for physical performance to help you escape dangerous situations.

Scientists studied blood epinephrine levels in healthy, young male subjects before, during, and after workouts. Subjects completed 40 minutes of moderate-intensity exercise (50% max effort) and 15 minutes of intense exercise (87% max effort) followed by a rest period. Blood samples were taken from catheters inserted into leg muscles. Blood samples were drawn from the participants at 2-minute intervals.

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Figure 1: Comparison of responses during 40 minutes of moderate-intensity exercise (50% max intensity) and 15 minutes of intense exercise (87% max intensity) in normal young male subjects. A rest period termed baseline was followed by exercise of the two different durations, as shown between the broken vertical lines. The break in the line for intense exercise is to permit plotting the recovery (R) period (R0-R120) starting from cessation of exercise. Data are presented as a means of SE.

Study 2

Plasma catecholamine responses to four resistance exercise tests in men and women

Publish Date: July 1999 Journal: European Journal of Applied Physiology Occupations Physiology Authors: Pullinen, T, Nicol C, MacDonald, E, Komi, PV Link: <u>https://doi.org/10.1007/s004210050568</u>

Overview of the Study

Scientists aimed to compare the blood plasma adrenaline responses of normal healthy men and women to different dynamic resistance exercise tests performed until exhaustion. To study this, they recruited nine healthy men and eight healthy women. Some were recreationally active, but none were participating in any kind of training program.

The protocol comprised four test sessions, each separated by at least three days of minimal physical activity in between. In each test session, a bilateral leg extension-flexion exercise test was performed with a special variable resistance machine. Each test was performed at a given load that represented either 80%, 60%, 40%, or 20% of the one repetition maximum (1RM) load of each subject. During each movement cycle, the leg extensor muscles worked concentrically during the extension phase and eccentrically during the flexion phase.

The tests always started at the same time of day with a warm-up followed by a 10-minute rest in a sitting position. To study the plasma adrenaline responses, one venous blood sample of 5 ml was taken with a heparinized needle from the antecubital vein at the end of the 10-minute rest and immediately after the exercise. Blood adrenaline in each sample was measured using a biochemical analysis.



Figure 2: Mean and SD plasma Adrenaline concentrations in women (black bars) and men (white bars) in four resistance exercise tests (E80 = 80% 1RM, E60 = 60% 1RM, E40 = 40% 1RM, E20 = 20% 1RM). Significant differences between the groups from pre-exercise and corresponding values to exercise are represented by the bars; for specific workouts with significant differences, the values 80, 60, 40, or 20 are noted.