Exploring the Science of Exercise Physiology: Understanding the Body's Response to Physical Activity

Daniel W*

Department of Physical Therapy, Beni-Suef University, Beni Suef, Egypt

Opinion Article

Received: 20-Feb-2023, Manuscript No. JMAHS-23-94245; **Editor assigned:** 23-Feb-2023, Pre QC No. JMAHS-23-94245 (PQ); **Reviewed:** 09-Mar-2023, QC No. JMAHS-23-94245; **Revised:** 16-Mar-2023, Manuscript No. JMAHS-23-94245 (R); **Published:** 27-Mar-2023, DOI: 10.4172/2319-9865.12.1.006.

***For Correspondence:**

Daniel W, Department of Physical Therapy, Beni-Suef University, Beni Suef, Egypt

E-mail: danil124@iel.edu

Citation: Daniel W, Exploring the Science of Exercise Physiology: Understanding the Body's Response to Physical Activity. 2023;12:006.

ABOUT THE STUDY

Exercise physiology is the physiology of actual activity. The study of exercise induced acute responses and long-term adaptations are one of the allied health professions. The highest-qualified exercise professionals use education, lifestyle modifications, and specific forms of exercise to treat and rehabilitate both acute and chronic conditions and injuries.

Metabolic changes

Rapid energy sources: Energy required to perform short-lasting, high-intensity bursts of activity is derived from anaerobic metabolism within the cytosol of muscle cells, as opposed to aerobic respiration, which utilizes oxygen, is sustainable, and occurs in the mitochondria. Understanding the effect of exercise involves studying specific changes in muscular, cardiovascular, and neurohumoral systems that lead to changes in functional capacity and strength due to endurance training or strength training. The effect of training on the body and the speedy energy sources comprise of the Phosphocreatine (PCr) framework, quick glycolysis, and adenylate kinase. Adenosine Triphosphate (ATP), which is the universal energy source in all cells, is re-synthesized by all of these systems. The most quick source, yet the most promptly exhausted of the above sources is the PCr framework which uses the protein creatine kinase.

Plasma glucose

When there is an equal rate of glucose disposal (removal from the blood) and appearance (entry into the blood), plasma glucose is said to be maintained. In the sound individual, the paces of appearance and removal are basically equivalent during activity of moderate force and span; however, excessively long or intense exercise can lead to an imbalance that favors a higher rate of disposal than appearance. At this point, glucose levels drop, causing fatigue. The rate of glucose appearance is determined by the amount of glucose absorbed by the gut and the amount of glucose produced by the liver (hepatic). The liver is capable of catabolizing stored glycogen (glycogenolysis) and synthesizing new glucose from specific reduced carbon molecules (glycerol, pyruvate, and lactate) in a process known as gluconeogenesis, despite the fact that glucose absorption from the gut is not typically a source of glucose appearance during exercise.

Glucose management: While its counter-regulatory hormones appear in greater concentrations, insulin secretion decreases during exercise and does not play a significant role in maintaining a normal blood glucose concentration. Growth hormone, glucagon, and epinephrine are the most important of these. The liver's (hepatic) glucose output is influenced by all of these hormones, among other functions. For instance, growth hormone and epinephrine both increase the release of Non-esterified Fatty Acids (NEFA) by stimulating adipocyte lipase. This preserves glucose utilization and aids in the control of blood sugar levels during exercise by oxidizing fatty acids.

Exercise for diabetes: When someone has diabetes mellitus, exercise is a particularly effective way to control their blood sugar levels. Moderate exercise has been shown to lower total plasma glucose concentrations when blood glucose levels are elevated (hyperglycemia). This is because the body uses glucose more efficiently than it appears. As previously stated, this glucose disposal mechanism is insulin-independent, making it particularly suitable for diabetics. In addition, approximately 12 to 24 hours after exercise, there appears to be an increase in insulin sensitivity. This is especially helpful for people with type II diabetes who are producing enough insulin but have peripheral insulin signaling resistance. However, due to the possibility of ketoacidosis-related complications, diabetics should avoid exercise during extreme hyperglycemic episodes. Due to increased ketone synthesis in response to elevated circulating NEFAs, exercise may make ketoacidosis worse.