DPT 4th Semester

Course Title: Exercise Physiology **Instructor: Dr. Ahmed Hayat**

MID Term Assignment **Marks: 30**

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Q1: Write a paragraph on the short term and long term effects of exercise on cardiovascular system

Answer:

Many people know that regular exercise can aid in weight loss, improve mood and boost energy. But exercise has both Short and Long term effects on the cardiovascular system.

The Cardiovascular system delivers nutrients and oxygen to all cells in the body, and consists of the heart and the blood vessels.

Short Term Effort Of Exercise On Cardiovascular System:

Many short term effects take place during physical activity include:

- Faster heart contraction. This leads to an increased heart rate and increased circulation which gets oxygenated blood to muscles quickly.
- More forcefully heart contraction with each heartbeat, which leads to a greater amount of blood being pumped throughout the body.
- Increase in stroke volume (SV).
- Increase in cardiac output (Q).
- Increase in blood pressure (BP).

Long Term Effort Of Exercise On Cardiovascular System:

A fairly well conditioned athlete can see long term cardiovascular effort form exercising in as little as two weeks. People who are just beginning to Exercise will see effects in up to four weeks. These effects include.

- The heart and longs become more efficiently as cardiovascular training increase.
- Decrease resting heart rate which means heart doesn't have to beat as often to circulate blood.
- Improve ability to draw in deeper and longer breaths and take fewer breaths.
- Reduced risk of heart disease.

The Cardiovascular System uses a combination of central nervous system and local mechanism to respond to exercise. Exercise increases the sympathetic activity and reduces parasympathetic activity leading to increased contraction and increased stroke volume.

Q2: During exercise which hormones are involved and how they response to exercise

Answer:

Hormones That Involved During Exercise And Response:

The eight hormones involved during exercise are

1) Insulin
2) Glucagon
3) Cortisol
4) Epinephrine and Norepinephrine
5) Testosterone
6) Human Growth Hormone
7) Insulin Growth Factor
8) Brain Derived Neurotrophic Factor

Insulin:

A peptide hormone produced by the pancreas. It regulate carbohydrate and fat metabolism. It is important to know that insulin can cause fat to be stored in adipose tissue instead of being used to fuel muscle activity. When exercise starts, the sympathetic nervous system suppresses the release of insulin, consequently, it is important to avoid foods with high levels of sugar before exercise because it can elevate insulin levels and promote glycogen storage instead of allowing it to be used to fuel physical activity.

Glucagon:

Glucagon released in response to low levels of blood sugar, glucagon is produced by the pancreas to stimulate the release of free fatty acids from adipose tissue and increase blood glucose levels, both of which are important for fueling exercise activity. As glycogen levels are depleted during exercise glucagon released additional glycogen stored in the liver.

Cortisol:

Cortisol is a catabolic steroid hormone produced by the adrenal gland in response to stress, low blood sugar and exercise. It supports energy metabolism during long periods of exercise by facilitating the breakdown of triglyceride and protein to create the glucose necessary to help fuel exercise. Exercising for too long can elevate levels of cortisol to catabolize muscle protein for fuel instead of conserving it to be used to repair damaged tissue.

Epinephrine and Norepinephrine:

These amine hormone play an important role in helping the sympathetic nervous system produce energy and in regulating the body's function during cardiorespiratory exercise.

Testosterone:

Testosterone is responsible for muscle protein resynthesis and the repair of muscle protein damaged by exercise and plays a significant role in helping grow skeletal muscle. It works with specific receptor sights and is produced in response to exercise that damages muscle protein.

Human Growth Hormone:

The body produces HGH during the REM cycles of sleep and is stimulated by high intensity exercise such as heavy strength training, explosive power training or cardiorespiratory exercise at or the onset of blood lactate.

Insulin Growth Factor:

IGF is a peptide hormone produced in the liver and supports the function of HGH to repair protein damaged during exercise, which makes it an important hormone for promoting muscle growth.

Brain Derived Neurotrophic Factor:

The production of BDNF is closely related to the production of HGH and IGF, the same exercises that elevate levels of those hormone also increased amount of BDNF. High intensity exercise can stimulate anabolic hormone for muscle growth while elevating levels of BDNF which can help improve cognitive function.