International Journal of Academic Research and Development
ISSN: 2455-4197; Impact Factor: RJIF 5.22
www.newresearchjournal.com/academic
Volume 1; Issue 4; April 2016; Page No. 20-21

Effects of physical exercises / training on muscular system

Kumar Banish

PhD. Research Scholar Punjab University, Chandigarh, Punjab, India.

Abstract
These muscles constitute about 40% of our body weight. The muscle's point of attachment to bones of other muscles are designated as origin or insertion. The point of origin is the point of attachment to the bone to which the muscle is anchored. The point of insertion is the point of attachment to the bone the muscle moves. Generally, the muscles are attached by tough fibrous structures called tendons. These attachments bridge one or more joints and the result of muscle contraction is movement of these joints. The body is moved primarily by muscle groups, not by individual muscles. These groups of muscles power all actions ranging from the threading of a needle to the lifting of heavy weights.

Keywords: aerobic, anaerobic, hypertrophy, oxidation etc

Introduction

About half the weight of our body is of our muscles. They make our body to move. There are about 650 muscles in our body and each one helps us in producing a particular movement. Muscles move our body with the help of bones. Blood is pumped throughout our body by the heart muscles. Exercise involves a series of sustained muscle contractions, of either long or short duration, depending on the nature of the physical activity. Effects of exercise on muscles can be considered short-term or immediate, both during and shortly after exercises; as well as long-term, lasting effects. Several movements activities of our body require many muscles working together. There are three major contractions namely:

- Isotonic Contractions,
- Isometric Contractions and
- Isokinetic Contractions

1. Isotonic or dynamic or concentric contraction is muscle contraction in which the muscle shortens with varying (different) tension while lifting a constant load.
2. Isometric or static or eccentric contraction is muscle contraction in which tension is developed but there is no change in the length of the muscle.
3. Isokinetic contraction is muscle contraction executed (performed) at a constant speed and in such a manner that the tension developed by the muscle while shortening is maximal over the full range of joint motion.

Physical exercises/training, particularly resistance or weight training, affects our muscular system to a great extent. Many parameters of muscular system get changed after resistance training. These are described here as under:

Hypotrophy of the Muscle

An increase in thickness in individual muscle fiber is called hypertrophy. Gains in strength and muscular endurance usually depend on the size of individual muscle fibers. In the hypertrophy (increase in size) of muscle the physical training especially with training causes the following effects:

1) Due to resistance training the size of muscle fibers increases.
2) Total amount of proteins increases, which is essential for muscle growth.
3) Capillary density per fiber also s increases which causes more energy production.
4) Amount of connective tissues increases.
5) Blood supply in the muscles increases.
6) Due to hypertrophy muscular strength and muscular endurance increases.

Biochemical Changes in Muscles

Aerobic Changes

1) Myoglobin content increases. Myoglobin is an oxygen-binding compound found in muscle tissue which acts as an oxygen store and helps in diffusion of oxygen.
2) Oxidation (breakdown) of carbohydrates and fat increases.
3) Number of mitochondria also increases thus more muscular energy is produced.
4) Level of activity of concentration of enzymes increases. Enzymes are protein compound that speed up chemical reactions in the muscles.
5) Amount of glycogen store increases as a result of training. Glycogen is essential for energy production in the muscles.

Anaerobic Changes

1) ATP-PC system capacity increases thereby more energy is released. ATP means Adeno Tri Phosphate and PC means Phosphocreatine. ATP-PC system is an anaerobic energy system in which ATP is manufactured when PC is broken down.
2) Glycolytic capacity also increases as a result of training.

Body Composition Changes

1) For most individual weight or resistance training produces little or no change in total body weight but the body composition changes considerably.

2) There can be significant losses of relative and absolute body fat.
3) Fat free weight or muscle mass increases significantly.
4) Change in muscle and joint motion also takes place.
5) After training flexibility increases which play an important role in physical activities and sports to enhance the performance and prevent serious muscular injury.

Conclusion

With the help of physical exercises and training the size of muscle fibers increases, amount of protein increases, capillary density per fiber increases, amount of connective tissue increases, blood supply in the muscle increases, myoglobin content increases, oxidation of carbohydrates and fat increases, number of mitochondria (power house of cell) increases, level of activity of concentration of enzymes and amount of glycogen store increases, total relative body fat is decreases, fat free-weight (muscle mass) is increases and flexibility increases.

References

1. Fox, Edward L. Sports Physiology. Halt: CBS College Publishing, 1984.
2. Singh Hardayal. Science of Sports Training. New Delhi: DVS Publications, 1991.
3. Wilmore JH, Costell DL. Physiology of sports and Exercise. Champaign. IL: Hman kinetics, 1999.
4. Shaver, Larry G. Essential of Exercise Physiology. Delhi: Surjeet Publications, 1982.
5. Nieman, David C. The exercise health connection. Champaign IL: Human kinetics, 1988.
6. Dick, Frank W. Sports Training Principles. London: Lepus Books, 1980.
7. https://www.boundless.com