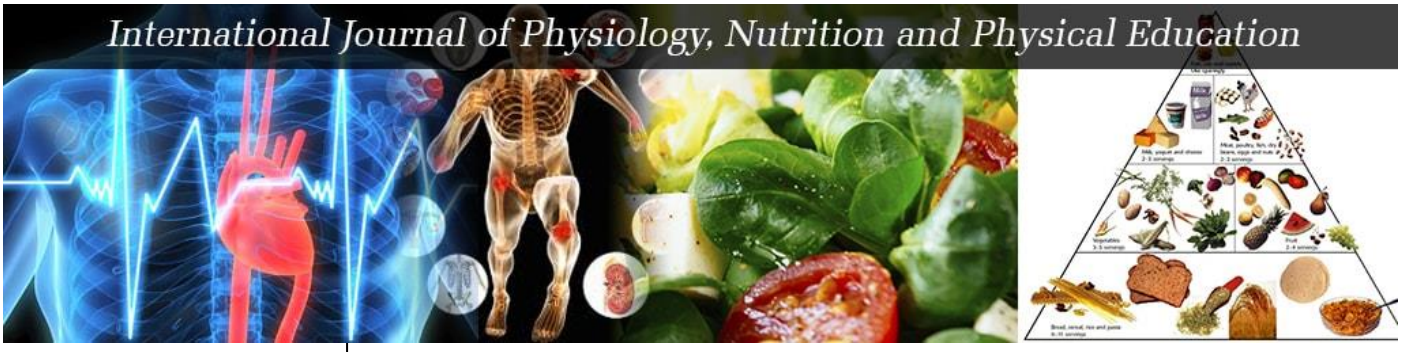

ISSN: 2456-0057
IJPNPE 2019; 4(1): 931-934

www.journalofsports.com
Received: 13-11-2018
Accepted: 14-12-2018

Harvinder Singh
Assistant Professor, Baba Farid College, Bathinda, Punjab, India

Correspondence
Harvinder Singh
Assistant Professor, Baba Farid College, Bathinda, Punjab, India

Impacts of exercise on muscular system

Harvinder Singh

Abstract
Every single human development, from the flickering of an eye to the running of a long distance race, rely upon the best possible working of our muscles. The reason for this area is to investigate different changes in strong frameworks of body concerning the physiological instrument required just as to the important preparing factor. Educators of physical instruction, mentors, sports people and understudies of physical instruction must know about the impacts of physical exercise preparing on different frameworks to understand the quantitative changes in the body for better execution. About a large portion of the heaviness of our body is of our muscles. They make our body to move. There are around 650 muscles in our body and every one encourages us in delivering a specific development. Muscles move our body with the assistance of bones. Blood is siphoned all through our body by the heart muscles. A few movements' activities of our body require numerous muscles cooperating. At the point when our heart beat, when a feast we have eaten travels through our digestive organs, and when we move any piece of our bodies muscle is included. The bunch capacity of the strong framework are performed by just three kinds of muscles skeletal muscle, smooth muscle and cardiovascular muscle. The three noteworthy muscle withdrawals are isotonic constriction, isometric compression and isokinetic contraction. Excitability, Contractility, Extensibility, Elasticity are considered as the significant attributes of muscle. Physical exercise/Training, especially opposition or weight preparing influence our solid framework to extraordinary degree. Numerous parameters of solid framework get changed after protections preparing that incorporate hypertrophy of muscle, biochemical changes in muscles (high-impact changes and anaerobic changes) and body structure changes.

Keywords: Strong framework, exercise and hypertrophy of muscle

Introduction
Exercise is the physical movement that will be arranged, organized and monotonous to condition any piece of the body. It is utilized to improve wellbeing, keep up wellness and is vital as a methods for physical rehabilitation. Exercise physiology is the investigation of how body's structure and capacities are changed because of activity. The human body contains in excess of 650 individual muscles moored to the skeleton, which give pulling power with the goal that you can move around. These muscle establish around 40 % to half of our complete body weight. The muscle's purpose of connection to bones or different muscles are assigned as beginning or inclusion. The purpose of inclusion is the purpose of connection deep down the muscle move. For the most part, the muscle appended by intense stringy structure called ligaments. These connections connect at least one joints and the consequence of muscle withdrawal is developments of these joints.

Kinds of Muscles
There are three fundamental sorts of muscle tissue in the human body.

Skeletal muscle: Otherwise called striated or striped muscle as a result of its striped appearance when seen under a magnifying instrument, this sort of muscle is willful, which implies it is under cognizant control. Skeletal muscles are basic to game and exercise as they are associated with the skeletal framework by means of ligaments and are essentially in charge of development. Skeletal muscles contract and, therefore, destroy on your issues that remains to be worked out development. They can end up exhausted amid exercise.

Cardiovascular muscle: This kind of muscle tissue is just found in the mass of your heart. It works persistently. It is automatic, which implies it isn't under cognizant control. It is made out of a specific kind of striated tissue that has its own blood supply. Its constrictions help to constrain blood through your veins to all pieces of your body. Every withdrawal and unwinding of your heart muscle all in all speaks to one heartbeat. The cardiovascular muscle does not weariness, which implies that it doesn't get worn out amid exercise.

Smooth muscle: An automatic muscle that works without cognizant idea, working under the control of your sensory system. It is situated in the dividers of your stomach related framework and veins and directs absorption and pulse.

Structure of Skeletal Muscle

A whole skeletal muscle is considered an organ of the muscular system. Each organ or muscle consists of skeletal muscle tissue, connective tissue, nerve tissue, and blood or vascular tissue.

Skeletal muscles vary considerably in size, shape, and arrangement of fibers. They range from extremely tiny strands such as the stapedium muscle of the middle ear to large masses such as the muscles of the thigh. Some skeletal muscles are broad in shape and some narrow. In some muscles the fibers are parallel to the long axis of the muscle; in some they converge to a narrow attachment; and in some they are oblique.

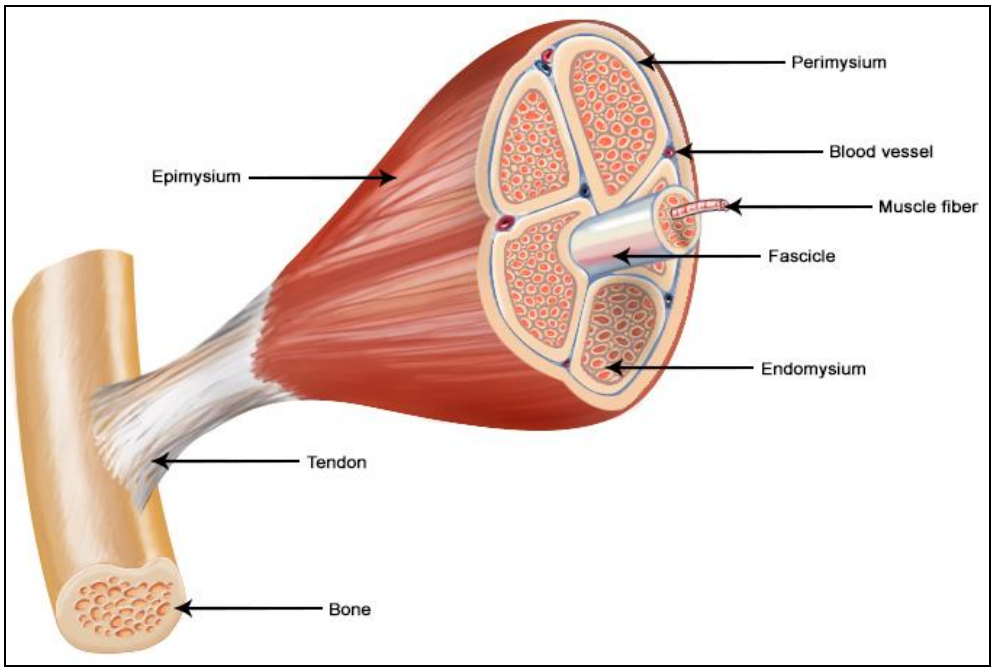

Fig 1: Structure of a Skeletel Muscle

Each skeletal muscle fiber is a single cylindrical muscle cell. An individual skeletal muscle may be made up of hundreds, or even thousands, of muscle fibers bundled together and wrapped in a connective tissue covering. Each muscle is surrounded by a connective tissue sheath called the epimysium. Fascia, connective tissue outside the epimysium, surrounds and separates the muscles. Portions of the epimysium project inward to divide the muscle into compartments. Each compartment contains a bundle of muscle fibers. Each bundle of muscle fiber is called a fasciculus and is surrounded by a layer of connective tissue called the perimysium. Within the fasciculus, each individual muscle cell, called a muscle fiber, is surrounded by connective tissue called the endomysium. Skeletal muscle cells (fibers), like other body cells, are soft and fragile. The connective tissue covering furnish support and protection for the delicate cells and allow them to withstand the forces of contraction. The coverings also provide pathways for the passage of blood vessels and nerves. Commonly, the epimysium, perimysium, and endomysium extend beyond the fleshy part of the muscle, the belly or gaster, to form a thick rope like tendon or a broad, flat sheet-like aponeurosis. The tendon and aponeurosis form indirect attachments from muscles to the periosteum of bones or to the connective tissue of other muscles. Typically a muscle spans a joint and is attached to bones by tendons at both ends. One of the bones remains relatively fixed or stable while the other end moves as a result of muscle contraction. Skeletal muscles have an abundant supply of blood vessels and nerves. This is directly related to the primary function of skeletal muscle, contraction. Before a skeletal muscle fiber can contract, it has to receive an impulse from a nerve cell. Generally, an artery and at least one vein accompany each nerve that penetrates the epimysium of a skeletal muscle. Branches of the nerve and blood vessels follow the connective tissue components of the muscle of a nerve cell and with one or more minute blood vessels called capillaries.

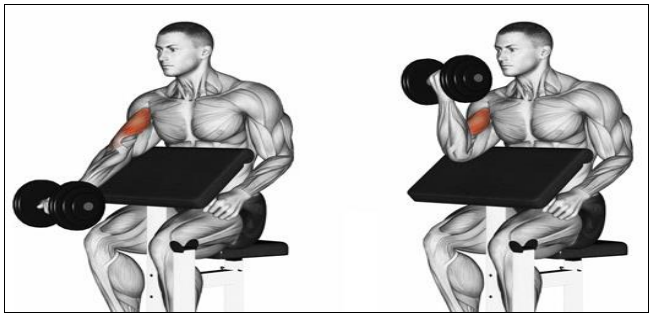

Fig 2: Kinds of Muscle Contraction

Muscle contractions during exercise can be divided into three categories; isotonic (meaning same tension throughout the contraction), isometric (meaning same tension), also known as a static contraction and isokinetic muscle contractions which are performed with a constant speed throughout the movement. Here we explain these in more detail including in which types of exercise they occur.

Isotonic Contractions

Isotonic contractions are those which cause the muscle to change length as it contracts and causes movement of a body part. There are two types of Isotonic contraction:

Concentric

Fig 3: Concentric

Concentric contractions are those which cause the muscle to shorten as it contracts. An example is bending the elbow from straight to fully flexed, causing a concentric contraction of the Biceps Brachii muscle. Concentric contractions are the most common type of muscle contraction and occur frequently in daily and sporting activities.

Eccentric

Eccentric contractions are the opposite of concentric and occur when the muscle lengthens as it contracts. This occurs when lowering the dumbbell down in a bicep curl exercise. The muscle is still contracting to hold the weight all the way down but the bicep muscle is lengthening.

Fig 4: Eccentric

Another very common example is the quadriceps muscles at the front of the thigh when landing from a jump. As you land the thigh muscles and in particular the quad muscles at the front of the leg are strongly contracting but also lengthening at the same time. This type of contraction puts a lot of strain through the muscle and is commonly involved in muscle injuries. Plyometric training exercises (hopping and bounding) involve a lot of eccentric muscle contractions and can lead to severe muscles soreness (DOMS) if you overdo it too soon.

Isometric Contractions

Fig 5: Isometric Contractions (Not Moving)

Isometric contractions occur when there is no change in the length of the contracting muscle. This occurs when carrying an object in front of you as the weight of the object is pulling your arms down but your muscles are contracting to hold the object at the same level. Another example is when you grip something, such as a tennis racket. There is no movement in the joints of the hand, but the muscles are contracting to provide a force sufficient enough to keep a steady hold on the racket. The amount of force a muscle is able to produce during an isometric contraction depends on the length of the muscle at the point of contraction. Each muscle has an optimum length at which the maximum isometric force can be produced.

Isokinetic Contractions

Isokinetic contractions are similar to Isotonic in that the muscle changes length during the contraction, where they differ is that Isokinetic contractions produce movements of a constant speed. To measure this a special piece of equipment known as an Isokinetic dynamometer is required. Examples of using Isokinetic contractions in day-to-day and sporting activities are rare. The best is breaststroke in swimming, where the water provides a constant, even resistance to the movement of adduction.

Impacts of Exercise on Muscular System

Exercise has both short and long term effects to muscular system.

Short term effects such as

Blood flow: After exercise you can notice that muscle tissue (warm muscle) is bigger than cold muscle, because of blood flow into them. It can increase by up to 25 times, because muscle requires more energy and oxygen.

Muscle fatigue: Is the decline in ability of a muscle to generate force. It can be a result of intense exercise, but abnormal fatigue may be caused by barriers to or interference with the different stages of muscle contraction. There are two main causes of muscle fatigue. The limitations of a nerve's ability to generate a sustained signal (neural fatigue) and the reduced ability of the muscle fibre to contract (metabolic fatigue).

Muscle exhaustion: General exhaustion often occurs after you have done too much activity at one time, such as by taking an extra-long hike. You may feel weak and tired, or

your muscles may be sore. These sensations usually go away within a few days. In rare cases, generalized muscle weakness may be caused by another health problem, such as problems with body regulating the distribution of energy to muscles and organs.

Muscle damage: Any effort beyond muscle ability level or accident can tear the fibres and cause muscle damage. When a muscle fibre is damaged, the body immediately starts to repair it at the cellular level. Muscles most of the time repairs by themselves (if body is functioning properly) through time. If damage or injury is critical, surgery might be needed.

Cramp: Because of over-exercise, lack of nutrients like magnesium or bad blood circulation when muscles don't receive enough oxygen. It is very painful and can be dangerous if doing exercise that involves heavy weights alone.

Long-term effects of exercise

Muscle size: Is mostly determined by persons genetics, but can be affected with life choices like: anabolic steroids, exercise, and healthy food. Exercising specific muscles regularly can increase their size by up to 60%. This increase in muscle size is mainly due to increased diameter of individual muscle fibres.

Muscle coordination: It trains muscles to work more efficient and effectively by working together. E.g.: when the prime mover contracts more rapidly the antagonist (muscle) must also relax as quickly to prevent blocking the movement.

Blood supply: As a result of frequent exercise over a sustained period of time both the quantity of blood vessels and the extent of the capillary beds increases.

Effects of exercise on muscular system would benefit by increasing size and number of mitochondria, improved perception of muscle tone and also overall improved:

- Coordination
- Power
- Balance
- Speed
- Agility
- Body composition
- Reaction time
- Muscular endurance
- Flexibility

Reference

1. Ross, Wilson. Anatomy and Physiology, ninth edition, London, 1963.
2. Garret William E, Kirkendall. Exercise and sport sciences Philadelphia: Cippincott. Williams & Williams, 2000.
3. Wilmore Jack H, Costill David L. Physiology of sport and exercise. USA: Human Kinetics, 1994.
4. Edward Fox L, Donald Mathews K. The physiological basis of physical education and atheletics. Philadelphia, 1981.
5. Rod Seeley R, Trent Stephens D, Philip Tate. Essentials of anatomy and physiology, second edition, Missouri, 1996.
6. John Clancy, Andrew Mcvicar J. Physiology and anatomy a homeostatic approach, London, 1995.
7. Gerard Tortora J. principles of human anatomy, fifth edition, New York, 1989.