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Muscle mechanics and physiology behind exercise

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Exercise comprises of various entities. All kinds of exercises are basically workout of myofibril- the muscle fiber. A single motor unit has a bundle of myofibrils working in a congruous manner to exert a force against resistance. In terms of various exercises, white muscles mainly act in anaerobic exercises. Red muscles are for aerobic exercises. White muscle has a large mass per motor unit, high ATPase activity and low myoglobin on other hand red muscle has small mass, low ATPase activity and high myoglobin which imparts red color. Myofibril acts as a unit of muscle bundle in every kind of muscle whereas myofibril has different protein fibers working for excitation-contraction coupling. Proteins of thin filaments are actin, tropomyosin and troponin. Myosin is the protein of thick filament. In case of exercise muscle contraction depends on the action of these filaments, either isotonic or isometric. Isotonic contraction occurs through cross bridge interaction of thick and thin filaments. ATP depletion is must for contraction. The load is given on a muscle in relaxed state is called preload. Though muscle has stretching property- by applying preload, it stretches and generates passive tension. Muscle's natural elasticity resists the stretch applied on it. The force of resistance is measured as passive tension. In anaerobic exercises, there is high capacity for anaerobic glycolysis resulting lactic acidosis. And aerobic exercises do not produce such, so aerobic exercises are better for maintaining regular fitness and weight reduction. Anaerobic exercises are good for strength tolerance and body building and on the other hand exercise needs more circulation and heart needs to pump blood more frequently which results hypertrophy of heart muscle. This hypertrophy can cause cardiomyopathy in young athletes due to pressure overload on heart.

Biography

Md Sakibuzzaman has completed his MBBS from Sir Salimullah Medical College, Dhaka, Bangladesh. He has participated in Indonesia International (bio) Medical Students' Congress (INAMSC) 2013 as a representative from his medical college. He has also participated in First International Conference on Sports Medicine and Fitness 2015. Now he has been working as an intern at Sir Salimullah Medical College.

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