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The Physiological Response Of Bone Tissue To Increase Physical Activity.

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ABSTRACT

In the skeleton of the athlete there are significant changes under the influence of enhanced muscle activity. With properly distributed loads, these changes are favorable. It was found that changes in the skeleton against the background of physical exertion appear gradually. Already after the first year of playing sports, it is possible to identify morphological changes in the bones. In the future, these changes stabilize, but the skeletal rearrangement occurs throughout the entire training process. At the termination of an active sports activity, adaptive bone changes remain for quite a long time. Strength training is able to speed up metabolic processes in the body, including bone tissue, thereby strengthening the body as a whole. Power and shock exercises can be performed without leaving the house and thus not to depend on the weather. The experience of using simulators for rehabilitation purposes and with people of old age showed that their effectiveness increases with the directed work of teachers, coaches and instructors in the intellectualization of the training process. This means that everyone involved must be convinced of the need and be able to ensure their own individual parameters at the highest possible level of compliance with their individual parameters; their physical self-improvement, in the structure of lifestyle. It should be borne in mind that even a small success in this direction is already a prerequisite to the success of its recovery.

Keywords: physical activity, muscular activity, physical culture, sport, bones, adaptation.

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INTRODUCTION

Physical activity causes adaptive changes in the human body. The effect of physical stress on the body has long been studied [1, 2]. Special attention has always been paid to changes in the bone tissue of athletes [3, 4]. It was found that significant changes occur in the skeleton of an athlete under the influence of enhanced muscular activity [5]. Other factors influence the state of the skeleton: the characteristic position of the athlete's body, the force of pressure on the skeleton, the force of stretching when hanging, and when the body is twisted. With properly distributed loads, these changes are favorable [6]. Otherwise, pathological changes of the skeleton are possible [7].

It can be represented as follows the most simple mechanism for the appearance of a skeletal change in athletes [8]. Under the influence of muscular loads, reflex dilatation of the blood vessels occurs, the nutrition of the working organ, first of all the muscles, and then the nearby organs, in particular the bones, improves [9,10].

It was found that changes in the skeleton against the background of physical exertion appear gradually [11]. Already after the first year of playing sports, morphological changes in the bones can be detected [12]. Subsequently, these changes stabilize, but the skeletal rearrangement occurs throughout the entire training process [13]. When active sports activities cease, adaptive bone changes remain for a rather long time [14].

Under the influence of sports, changes in the internal composition of the bone are expressed in the thickening of its compact substance. It is usually more pronounced in those bones that have a special load. In this regard, the bone cavity is reduced [15,16]. With large static loads, it decreases almost to full overgrowth. Considering these changes in the bone tissue under conditions of regular physical exertion, the goal was set in the work: to consider the peculiarities of the reaction of bones to certain types of regular physical training.

BONE REACTION TO STRENGTH EXERCISES

Strength training can have a positive effect on the skeletal system due to the pronounced mechanical load on the skeleton, resulting from the strong muscular contractions necessary for lifting, pushing or pulling heavy weights. This is due to the fact that the muscles that are attached to the bones by the tendons formed by connective tissue, under stress, stress in the bones to which they are attached. If the skeleton is periodically subjected to stress (as happens in the case of regular exercises), then it reacts with an increase in bone mass, this leads to an increase in its strength and allows it to better withstand powerful muscle contractions [17].

In addition to strengthening the muscles needed to prevent falls, strength training also develops the muscles necessary to perform everyday household tasks that require a certain strength. In addition, the strong muscles of the legs facilitate the maintenance of body balance and movement, which also helps to reduce the risk of falls [18,19].

BONE TISSUE DURING SHOCK EXERCISES

Exercises with a large impact, which are usually performed in the form of jumps, offer a quick and easy way to increase bone density of the femur [20]. The effectiveness of jumping classes is due to the fact that they exert a load on the skeleton, which it usually does not undergo [21]. The impact of jumping lessons is due to the fact that when we land after a jump on the ground, the resulting force is transmitted to the skeleton [22]. The skeleton perceives this force as a stressful effect, and reacts with an increase in bone mass in order to adapt to the load resulting from regular jumping exercises. Such an adaptation resembles that which occurs under the influence of strength exercises, when the bone system is subjected to stress under the action of strong muscle contractions [23,24].

Studies have shown that women who are engaged only in jumping or in combination with another program of physical activity, for example, walking or strength training, maintain or increase the mass of the femur. The effects of jumping in combination with strength exercises on the skeletal system of women of middle and older age were studied [25]. In women who regularly, three times a week, do strength exercises and additionally perform 50-100 jumps, an increase or preservation of the femur mass was observed [26]. It

becomes clear that jumping can be the only means of training impact in a special program to strengthen the femur or be part of a comprehensive program of physical activity aimed at strengthening the femur and spine, as well as achieving other health effects, in particular for the prevention of cardiovascular diseases. systems and the development of muscle strength [27,28].

People who have disorders of the musculoskeletal system, especially diseases of the joints, or are overweight, should discuss the possibility of practicing jumping with their doctor before starting the program of physical activity [29,30].

Jumping exercises may not be suitable for everyone, but they will be very popular with people who consider them the fastest way to strengthen their bone system [31,32]. Since jumps take only 5–10 minutes to complete, they can be performed at the end of a walk or a run, which makes them more attractive for people with a busy day schedule [33-35].

CONCLUSION

Strength training is able to speed up metabolic processes in the body, including bone tissue, thereby strengthening the body as a whole. Impact exercises can strongly stimulate the muscles. Experience in performing exercises has shown that their effectiveness increases with the directed work of teachers, trainers and instructors in the intellectualization of the training process. This means that everyone involved must be convinced of the need and be able, at the highest possible level to ensure compliance with their individual parameters, if possible, independently organize their own activities, that is, their physical self-improvement in the course of everyday life.

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