THE DEVELOPMENT OF FORCE IN SPEED REGIME IN THE TRAINING OF FOOTBALL PLAYERS THROUGH THE PLIOMETRIC METHOD

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Abstract: The pliometric become known very quickly by coaches and players according as the exercises had straight target the combination of force and speeds movement to produce power. The pliometric training become essential for jumping, carrying and blowing up sportsmen. In jumping sportsmen category join football players too, especially that in the last time their aerial game is a frequently suitableness to finish. In football players preparation, close by specific classic training, is necessary a „jumping training" what is observing its general principles and adequate preparation period.

Introduction:

Pliometry is defined as exercises that make a muscle able to reach maximum strength in the shortest possible time. In sports we distinguish three types of muscle contraction: eccentric, isometric and concentric. Eccentric contractions, which occur when the muscle stretches under tension, are used to slow down the body. In the case of the steps of a runner, for example, the impact with the ground on one leg requires a rapid lowering of the center of gravity of the body. The runner does not fall at this time because the leg muscles can contract and control this downward movement. Halfway through, the body reaches a complete stop and an isometric contraction occurs, a static position in which no muscle contracts visibly for a viewer. In the game of football, this contraction occurs shortly between the eccentric contraction and the next concentric contraction, in which the muscle fibers tighten and shorten. Then, this concentric contraction results in the acceleration of the lower limb segments in running.

Research in studies that examine great jumpers and sprinters or other athletes who rely on the ability of speed and muscle strength have shown that these athletes do not stay on the ground for too long. These elite athletes have learned that energy is stored during the eccentric phase of

muscle contraction and is partially recovered during concentric contraction. However, the potential energy developed in this process can be lost (in the form of heat generation) if the eccentric contraction is not immediately followed by a concentric contraction. This conversion from a negative (eccentric) to a positive (concentric) thing has been described in the literature as the amortization phase.

Material-method

The physiological research underlying plyometrics, or the „stretch-shorten" cycle of muscle tissue, has been reviewed by several authors. Specialists reported the presence of two factors: the series of elastic components of the muscle, which include the tendons and bridge features of actin and myosin that make up muscle fibers and sensors in muscle spindles (proprioceptors) that play the role of anticipating muscle tension and changing the sensory impulse related to rapid muscle stretching for activation „Stretching reflex". Muscle elasticity is an important factor in understanding how the stretching-shortening cycle can produce more power than a single concentric muscle contraction. The stretching or myostatic reflex responds to the level at which a muscle is stretched and is one of the fastest reflexes in the human body. The reason is the direct connection from the sensory receptors to the cells in the spinal cord and then to the muscle fibers responsible for contracting. Other reflexes are slower than the stretching reflex because they are transmitted through several different channels reaching the central nervous system before a reaction occurs. [1]

In the training of football players, along with the specific classic training, a „jumping training" is required, which will respect its general principles and the corresponding training period. The plyometric exercises in „jump training" are classified according to the demands of the athlete, but all can be progressive in nature, with a range of effort parameters from low to maximum in each type of exercise. The plyometric exercises in „jump training" can be the following:

1. A jump on the spot is a jump made by landing at the same point where the jump started. These exercises are of relatively low intensity; however, they provide the stimulus for the development of a shorter cushioning phase, requiring the athlete to jump again quickly after each jump. The jumps on the spot are made one after the other, with a short cushioning phase. [2]

2. A standing jump accentuates a single maximum effort both horizontally and vertically. The exercise can be repeated several times, but a full return should be allowed between each effort. [2]
3. Multiple jumps combine the skills developed by standing jumps and standing jumps; they require maximum effort, but are made one after the other. These executions can be done alone or with an obstacle. An advanced form of multiple jumps are crate exercises. Multiple jumps can be made over distances of less than 30 meters. [2]
4. Jumping exercises exaggerate the normal running pace to emphasize a specific aspect of the walking cycle. They are used to improve the length and frequency of steps. They are typically performed over distances of more than 30 meters. [2]
5. Crate exercises combine multiple jumps with deep jumps. They can be of low intensity or particularly accentuated depending on the height of the crates used. They include both horizontal and vertical elements for successful execution. [2]
6. Deep jumps use the weight and gravity of the athlete's body to exert a force on the ground. Deep jumps are performed by stepping outside a crate and letting go of the ground, then trying to jump back to the height of the crate. Because deep jumps have a recommended intensity, you should never jump (rather than step) from the top of the crate, as this adds height and increases the shock of landing. Controlling the height from which the athlete lets go helps not only to accurately measure intensity, but also to reduce fatigue problems. The moment he comes in contact with the ground, the athlete straightens his body up as quickly as possible. The key to performing this exercise and decreasing the damping phase is as short a contact with the ground as possible. [3,5]

A significant advantage of plyometric training is that it requires very little prefabricated equipment. Among the equipment used we list:

1. The plastic cones with a height of 20 and 60 centimeters serve as barriers to jump over. The flexibility of the cones makes it less likely to cause injury if they land directly on them.
2. The crates. The crates need to be specially built, but they are far from complex. A certain type of crates made of 8-10 cm plywood is required (only for elite athletes with previous workouts with heavy weights). The crates also require adequate landing surfaces (top) of at least 45-60 centimeters. Landing surfaces must be made smooth and non-slip by mixing sand in the paint used to cover the crates or by gluing a carpet or rubber material to the landing surfaces.

3. Fences and obstacles. Most physical education programs in schools contain fences and obstacles. Fences, which are adjustable for degrees of difficulty, are indeed a risk due to their rigid construction and should only be used by athletes experienced in plyometrics.
4. The steps. Stadium ladders or steps can also be used for plyometric training, with only one condition: they must be carefully examined to make sure they are safe for jumping. Concrete steps are unpleasant for jumping because they are inelastic surfaces.
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Conclusions:

In plyometrics the intensity is controlled by the type of exercise performed. Pliometry ranges from simple tasks to very complex and tiring exercises. It is much less tiring to start with jumps on both legs - like a rope - than with alternative jumps. Jumping on both legs is less intense than jumping on one leg. The intensity of plyometric exercises can be increased by adding small loads in some cases, raising the height of the platform for deep jumps, or simply by covering a greater distance in longitudinal jumps. Other writers have appreciated the intensity of various plyometric exercises from low to very intense, or from low to high. The volume represents the entire activity performed in a single session or training cycle. In the case of plyometric training, the volume is often measured by counting the foot contacts. For example, a three-part stading triple jump activity counts as three foot contacts. Foot contacts are a way of prescribing and monitoring the volume of exercises. The recommended volume of specific exercises in any session will vary depending on the goals of intensity and progression. A beginner in a single off-season workout could have 60 to 100 foot contacts in low-intensity exercise. The intermediate athlete may be able to have 100 to 150 contacts of moderate intensity exercise in the same cycle. Advanced athletes may be able to handle 150 to 250 foot contacts in low to moderate intensity exercises in this cycle. [2,6]

Period	Level			
	Beginner	Intermediary	Advanced	Intensity
Out of season	60-100	100-150	120-200	Low - moderate
Preseason	100-250	150-300	150-450	Moderate – high
Championship season	Only relaxion			Moderate – high

Low-intensity exercises used during warm-ups are generally not included in the number of foot contacts when recording volume. Thus, the warm-up must remain of low intensity and of a progressive nature so as not to subject the athlete to a maximum effort. Frequency is how many times an exercise (repetitions) is performed, as well as how many times the exercise sessions take place during a training cycle. The practical experience of European coaches has led to the conclusion that 48 to 72 hours of rest are needed for complete relaxation before the stimulus of the next exercise, although the intensity of the exercises must be taken into account. Due to the tiring nature of plyometrics and the emphasis on performance quality, plioometric exercises must be performed before any exercise program. They can be integrated into load training (complex training) in a later cycle of the training year. When plyometric training is not part of the complex training, it can be scheduled twice a week, but taking into account the principle of relaxation (48 to 72 hours Recovery is a key variable in determining whether plyometrics develops muscle strength or endurance. For strength training, longer relaxation periods (45 to 60 seconds) between sets allow for maximum relaxation between efforts. Given that plyometric training is an anaerobic activity, relaxation periods shorter than 10-15 seconds do not allow for maximum relaxation and develop muscular endurance.

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