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Effect of occlusion style resistance training on the maximum strength of the lower limbs of soccer players

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Abstract
The current study investigates the role and effect of occlusion style resistance training among young soccer players, as well as its effect on the development of physical abilities in the lower limbs of the two men. The researcher noticed a big problem that football players suffer from when using resistance exercises with weights during the competitive season, as these high-intensity exercises and large repetitions constitute additional burdens that may exceed the capabilities of young players, which leads to the phenomenon of overload and functional stress and consequently injury. The avoidance of this phenomenon and the use of modern scientific methods in the number of training doses and taking into account the duration of work and rest usually achieve a full recovery. Among the modern methods are exercises to restrict blood flow to working muscles, and it aims to develop muscle properties and increase muscle mass and strength with an intensity that does not exceed (50% of the MR-1), and the experimental approach was used for its suitability and the nature of the research, as the research community was chosen in a random way of their number (20) Player, the researcher concluded that the use of this method, according to stratigraphy exercises, effectively contributed to the development of horizontal and vertical jumping for soccer players .
Keywords*: Occlusion, Resistant, limbs.*

Introduction

The development and technical and technical modernity in the physical and sports sciences have prompted scientists, researchers and athletes to find safe, varied and necessary alternatives to develop capabilities and skills in training and competition and to use increasingly diverse and effective methods to achieve achievement in an older ball game, as these sciences and related sciences have contributed In understanding the effects of the mechanisms of movements and exercises and their doses on physical and functional abilities, and together they formed scientific models aimed at developing everything related to athletes in terms of achievement and prevention. A relatively recent approach is the restriction of blood flow exercises to working muscles, which aim to develop muscular properties and increase muscle mass and strength. As this technique consists of restricting blood flow or vascular occlusion associated with exercise exercises for the limbs from performing low-intensity resistance training. In which he used a variety of techniques and devices as well as using very simple tapes and equipment, and from his training procedures, he placed a relatively flexible tape on the part near the lower or upper extremities to be trained on, which provides suitable surface pressure. Studies have focused on the effect of these exercises on the characteristics of a growth hormone in the blood, as well as their effects on muscle strength and size (15: 308-314). It stimulates endogenous hormonal responses, including growth hormone and muscle protein synthesis. Training of resistance or weightlifting in football is one of the most important factors that help in building and developing functional strength, as well as meeting the requirements of competition or the training loads associated with the training season that players need to achieve integration in the physical characteristics of football players.

The development of muscular performance is fundamental to improving the physical characteristics of players who compete at high levels (18). Muscular strength is closely related to improved strength time characteristics and reduced injury risk (12: 765--785) (4: 783). Strength and conditioning programs based on resistance training have proven effective in developing general neuromuscular function (11: 168-174), sprint performance (10:11), vertical jump (VJ) (5: 791), and change of direction (9: 223-231).), And to prevent muscle injury in soccer. (16: 66-73) However, since strength development depends on a combination of many physiological, morphological and neurological factors, careful handling of training variables such as size, intensity, and exercise choice is mandatory to improve physical performance (13: 1419.(

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It therefore seems logical that developing a more effective and efficient method of strengthening strength, in a relatively short period of time, would be of great benefit to coaches and athletes in football in terms of performance. Combining low-intensity resistance training (20% of 1-RM) with restricted venous blood flow to working muscles may also provide an alternative method to traditional high-intensity HIT exercises (80% of 1-RM) currently used in training programs. Weights. (14: 61-65) Therefore, there are no published studies regarding the effects of these exercises on the physical abilities of Iraqi soccer players. Thus, the purpose of this study was to investigate the effects of short-term resistance training of occlusal training on some of the lower limbs physical abilities of the legs of soccer players.

Research Problem

The researcher noticed a major problem experienced by young soccer players, which is the use of resistance exercises with weights during the competitive season, as these high-intensity exercises and large repetitions constitute additional burdens that may exceed the capabilities of young players, which leads to the phenomenon of overload and functional stress and consequently injury. The avoidance of these negative factors and the use of modern scientific methods in the number of training doses and taking into account the duration of work and rest usually achieve full recovery. Among the modern methods are occlusal exercises to working muscles, and it aims to develop muscle properties and increase muscle mass and strength with an intensity that does not exceed (50% of the MR-1), so in this research the researcher used resistance exercises according to the occlusion style training method or blood restriction to working muscles. To provide two important principles, the first is to legalize the stresses or burdens and the high requirements in the game of football in order to develop the characteristics of muscle strength and the second to maintain the safety of athletes from injuries and overload, by regulating training doses according to the training method of stratification that are low stresses for football players .

Aims

1-Preparing training doses according to the occlusion style method for young football players.
2-Identify the effect of occlusion style exercises on the maximum strength characteristics of the lower limbs of soccer players.

Hypothese

-There are statistically significant differences between the two groups in favor of the experimental group.

Research Methodology:

The researcher used the experimental approach in the manner of two groups of soccer players (an experimental group (occlusion style) and the other (control).

The participants

The research sample was chosen randomly from a group of Al-Atheer Sports Football Club in Baghdad from the research community, whose number is (27) players, representing the original research community, and the research sample included (20) players from the research community who constitute a percentage of (74%) of the original community, and the sample was divided into two groups, experimental and control, with (10) players for each group.

Table (1) parametric properties of the participants

Variables	Mean	SD ±	Median	skewness
Age / year	19.6	0.753	19	0.786
Height / cm	173.6	3.560	174	0.427
Body mass / kg	68.95	1.986	69	0.508

Pre-test and measurements:

The tests for the physical abilities of the lower extremities (vertical jump and horizontal jump) were conducted before starting to implement the exercises in a stratified manner in the study, and under the supervision of the assistant work team. The same conditions and circumstances when taking the post-test, as all players were trained regularly 4 days a week for each group. The sample was randomly divided into two groups: the occlusion style training (n = 10) and the control group (n = 10).

Preparing exercises in the caste style for the experimental group- :

Layering exercises were done once daily for six consecutive weeks for 20 minutes after the warm-up. The sample performed 3 sets of 10-15 repetitions of exercises (Leg Extension, Machine Squat, Smith Machine Lunge, Lying Leg Curl, Seated Leg Curl, Machine Calf Raise. Severely from (20% of 1-RM) to (30% of 1-RM). The sample's rest time is 40 seconds between exercises, and this procedure was kept constant throughout the training period. A specially designed elastic belt was placed by the researcher for this purpose around the upper part of the thigh of both legs, during the exercise sessions, as the elastic belt was calibrated according to five degrees that were fixed on the tape as each degree represents a level of pressure on the target muscles as this pressure was suggested To restrict venous blood flow and cause blood to pool in the muscles distant from the site of restriction, on the first day, the tape pressure was set at the first level and then increased by 10 mm each day until the final pressure was reached to restrict the blood in the target area. As the muscle blood flow restriction was maintained throughout the entire exercise session, and it was released upon completion of the training doses in the catabolic method, the control group did not perform any exercises with restriction of blood flow, as the exercises were completely identical between the two groups except for restriction of upper limb muscles for the experimental group Training intensity was 65% for the control group, however, both the stratum groups and the control group carried out regular and equal training during the study period.

Final Exam and Measurements

The tests for the physical abilities of the lower extremities (vertical jumping and horizontal jumping) were conducted after the completion of the exercises in a occlusion style in the study, which lasted 6 weeks, and under the supervision of the assistant work team. Implementation, as an attempt by him to create the same conditions and circumstances when the pre-test was conducted.

Statistical Analysis

- The researcher used the Statistical Package (SPSS) version 17 in processing the results to reach the achievement of the research objectives.

Figure (1) shows the results of the vertical and horizontal jumping tests between the two groups (pre and post)

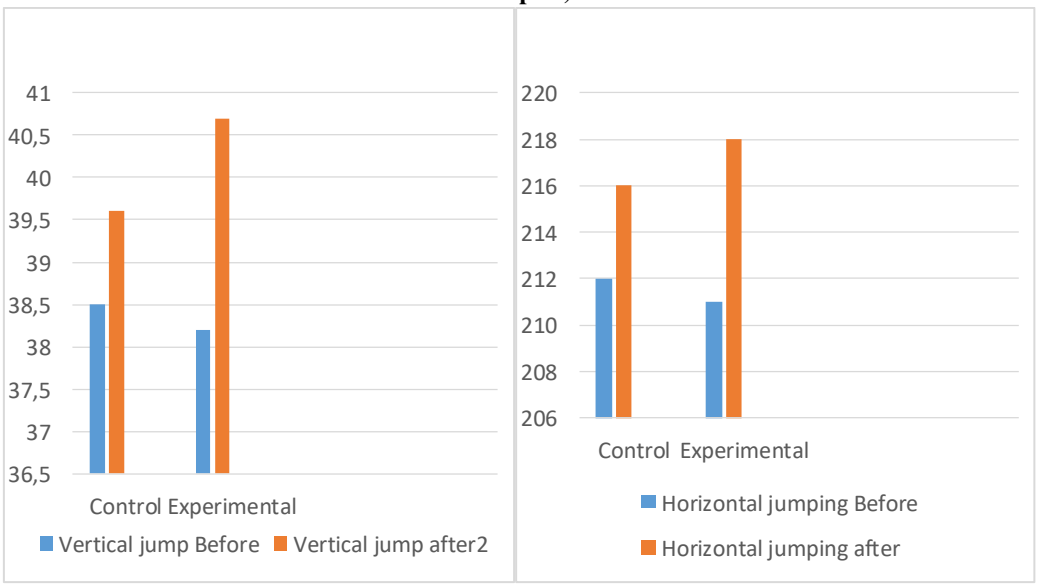

Table (2), which illustrated the results of the tests, the vertical and horizontal jump between the two groups in the test (pre and post).

Variables	N .P	Unit	Control		Experimental		T	Sig	Significance
			Mean	SD ±	Mean	SD ±			
Vertical jump Before	10	cm	38.500	.97183	38.2000	1.0328	.669	.512	Not significant

Vertical jump after	**10**	**cm**	**39.600**	**.69921**	**40.7000**	**.94868**	**-3.579**	**.002**	**significant**
Horizontal jumping Before	**10**	**m**	**2.1200**	**.00816**	**2.1110**	**.01101**	**2.077**	**.052**	**Not significant**
Horizontal jumping after	**10**	**m**	**2.1660**	**.00966**	**2.1850**	**.01269**	**-3.767**	**.001**	**significant**

Discussion

Through the results we obtained from Table (2), which illustrated the results of the tests, the vertical and horizontal jump between the two groups in the test (pre and post).

The course training had a role in improving the explosive strength of the two men in two directions of horizontal and vertical jumping for the players, as this six-week training once a day resulted in a noticeable increase in muscle size and muscle strength. This is a surprising observation given the extremely low-intensity training, and our results support previous findings that kaatsu training (similar to occlusion style training) leads to such improvements (1: 1460). In the current study, the researcher used an intensity from (20% of 1-RM) to (30% of 1-RM), and it is worth noting that the relationship between hypertrophy and muscle strength is important from a physiological standpoint and fulfilling the requirements of an athlete's performance. In general, skeletal muscle hypertrophy produces increased protein accumulation and contractile protein accumulation, which occurs when the balance between protein synthesis and degradation shifts toward synthesis. Rapamycin signaling pathways (mTOR) also play an important role in triggering the initiation of messenger RNA translation and muscle protein synthesis. Fujita et al. Also showed. (2008) that a single, severely 20% bout of knee extension exercise combined with kaatsu training increased quadriceps protein synthesis and the mTOR signaling pathway in young men, although the rate of muscle protein breakdown was not measured in a study (6: 1-8). This study showed that anabolic responses contribute to a noticeable increase in the strength of the muscles of the lower extremities of soccer players, according to resistance exercises in the occlusion style method, once a day. Muscle adaptation is controlled by increased muscle mass, which is directly related to the muscle strength of the players. Some studies have indicated that high-intensity workouts 3 times a week for 5 weeks result in significant increases in muscle size (5-6%) and inflationary potential by 0.3-0.5%. (2: 588) (3: 10-18) Training of resistance in the occlusion style, the ability and response of the muscles in the vertical and horizontal jumping of the players during six weeks at the rate of 5 sessions per week in exchange for the traditional exercises with weights for the control group for a period of six weeks at the rate of one session per week) The development in the hypertrophic potential and muscle strength of the players highlights the importance of the compressive training period Used during training in the occlusion style method on the lower extremities with extremely low intensity and stressed exercises. Given the level of change in muscle size and muscle strength potential, the occlusion style training response depends on the frequency of training doses in the training unit. In general, these data lead to the conclusion that increased muscle strength after occlusion style training is associated with changes in muscle hypertrophy (i.e., increased muscle protein contractile) as this finding highlights the importance of the hypertrophic response (increased muscle size) and the direct response to the production of strength. That this training reduces muscle and ligament stress factors, and the loads and training doses do not constitute a high load on the players. This finding is conclusive given the importance of the stressful training duration and, to some extent, the training frequency, which was discussed above and appears to be pivotal to low-intensity stratigraphy training. As some studies have indicated, the ability to compress duration of training is definitely linked with the use of low-intensity exercise, which does not appear to cause significant muscle damage or delay in recovery, as demonstrated by a lack of change in blood markers of muscle damage or immune stress (14: 61-65). (6: 1-8) (8: 813), while in traditional resistance training, the risk of injury and fatigue may pose to players due to increased resistance loads and training stresses that are not less than 70%. He also noted studies that reported severe muscle fatigue and discomfort in conventional exercises. This contrast makes cradle training or blood flow restriction exercises ideal for players and for elderly or frail individuals or during sports injury rehabilitation.

In conclusion, occlusion style training with resistance once daily increased strength in terms of performance and physiological ability in horizontal and vertical jumping for football players and for the benefit of the experimental group. As well as its role in fulfilling the requirements of this sport such as acceleration, deceleration, change of direction, interventions, jumps and technical skills performed by a football player and it seems that this effect in muscle strength is due to the period of compressed training (6 weeks), which

depends on repetition with low training intensity once a day, which is achieved These gains in muscle size and strength with minimal muscle fatigue or discomfort, making occlusion style training ideal if applied with the training modules at youth soccer effectiveness.

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