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The effect of short intermittent training (10-20) and (05-25) on the development of maximum aerobic speed (mas) of football players u19

أثر التدريب المتقطع قصير قصير(10-20)و(05-25) في تطوير السرعة الهو ائية القصوى(mas) لدى لاعبي كرة القدم أقل من 19سنة

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Abstract :This research aims to find out the effect of short intermittent training (10-20) and (05-25) in the development of the maximum aerobic speed (mas) of football players. The researcher assumed the existence of statistically significant differences in the level of (mas) between experimental sample 1 and 2. The researcher used the experimental method . The intentional sample was randomly divided by 10 players for both samples. The equivalence and homogeneity of the two samples were taken into consideration. The experiment was carried out using the method of short intermittent training for a period of 09 weeks, the data were collected and processed. Statistically with the spss program, the researcher concluded that short intermittent training (10-20) and (05-25) positively affected the development of maximum speed, so that we found statistically significant differences between pre and post test and in favour of the post test. Therefore, the researcher recommends using intermittent short training (05-25) to develop (mas)

Key words: short intermittent training (10-20) and (05-25), maximum aerobic speed, footballu19.

الملخص : يهدف هذا البحث إلى معرفة أثر التدريب المتقطع قصير قصير(10-20)و(05-25) في تطوير السرعة الهوائية القصوى mas للاعبي كرة القدم ، أفترض الباحث وجود فروق ذات دلالة إحصائية في مستوى السرعة الهوائية القصوىmas بين العينة التجريبية 1و2، استخدم الباحث المنهج التجريبي ، تم تقسيم العينة العمدية بالطريقة العشوائية 10لاعبين لكلا العينتين، وقد تم الأخذ بعين الاعتبار تكافؤ وتجانس العينتين ، تمت التجربة باستعمال طريقة التدريب المتقطع قصير قصير(10-20)و(05-25) لمدة 09 أسبوع ، جمعت البيانات وعالجناها إحصائيا ببرنامج spss ، توصل الباحث إلى أن التدريب المتقطع قصير قصير(10-20)و(05-25) أثر إيجابيا في تطوير السرعة الهوائية القصوى بحيث وجدنا فروق دالة إحصائيا بين الاختبارات القبلية والبعدية ولصالح الاختبار البعدى وعليه يوصى الباحث باستخدام التدريب المتقطع قصير قصير(05-25) لتطوير mas للاعبي كرةالقدم

- **الكلمات المفتاحية :** التدريب المتقطع قصير قصير (10-20)و(05-25) ، السرعة الهوائية القصوى ، كرة القدم

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*** Introduction and problematic of the research:**

Development in the field of sport refers to the improvement of the methods used in training In order to reach a high level in football, it is necessary to work on the measurement of this level, based on the scientific aspect, in order to improve and maintain fitness, The modern footballer needs many physical and technical requirements that differ from other physical activities in response to the form of performance and particularity that characterises a football player today to face competitors who often have the same physical characteristics and skills, making most football teams in developed countries at about the same level of performance (Amr Allah Ahmad Al-Basati, 1998, p.13),Physical training is one of the most important factors that contribute to the development of performance and is the key to success. Today's football player should have a very good physical condition and a great capacity for recovery due to the intensity of football competitions, In this respect physical preparation is the main aim in the planning of any training program as it enables the player to perform his motor skills at a high level of competence (Muwafak Majeed Al-Mawla, 2000, p. 244).

Football requires aerobic capacity, due to the continuous muscular work during the game and for a period of 90 minutes and more, so the player's level in football, whether physiological or physical, depends mainly on the capacity of the circulatory and respiratory systems, Bahaa Edine Ibrahim Salama argues that the importance of physiological preparation lies in the fact that it allows the player's functional abilities to be discovered and the extent of the player's preparation for his sport to be determined and directed according to these

physiological abilities and the preparations required of the player (Bahaa Salama, 2000, p. 270).

This led many researchers to study and research the optimal ways to push the athlete to achieve a better and distinct performance throughout the sports competition, particularly in view of recent developments in sports physiology and medicine Among them, the French researcher Gilles Cometti, who has established a new foundation for physical preparation for football based on the physiological and anatomical analysis of muscle fibres, their types and degree of speed, by changing the order of arrangement in the development of physical characteristics and represented them in an inverted pyramidal shape with endurance as the last one. Along with him, many researchers such as George Cazorla, the Algerian doctor Farhi, the Algerian doctor Brikissi, the American professor Michael Yasen, the Russian professor Kochansky and many others, all of them have made numerous contributions which have been at the origin of the great development of the modern science of sports training .

The method of intermittent training is nowadays attracting the interest of researchers for its effectiveness in football, especially as this training works with two systems (aerobic and anaerobic) and the amount of energy is related to the characteristics of the exercises (Bangsbo,2007), and also allows the development of the maximum oxygen consumption vo2 max and the development of the maximum aerobic power (Bogadnis,Et al 1995 p43), Cometti. G asserts that short training is a type of training that develops maximum aerobic capacity, and maximum aerobic speed (mas) is a true indicator in training, as the player should

have an average of 17.5 km / h of (MAS) to play at a high level (Jean-Poull, 2008,29) , Football is not a lactic sport as many people who train believe, and this was confirmed by Chamoux in his 1988 study of 13 players to evaluate lactate every 15 minutes (However, different energy systems contribute to different rhythms and this was confirmed by Fox and mathews to carry out functional work (Bernard Turpin, 2002, 11-12), adding to this a difference in the quality of the performance and its link with the play centres and its lines, as well as the obligations related to the plans and methods of individual play within their collective framework. This obliges the coach to prepare suitable training modules and avoid chance when setting up the terminology of the training program. Georges Cazorla confirms this, stating that lactic capacity is not a fundamental factor in football, but having this functionality can sometimes make a difference for players (in the case of defence, team attack, friction, evolution) and adds that the maximum speed indicator has become an important factor in football (Cazorla, 2006).

At the core of the divergent opinions of scientists and researchers, the researcher believes that the level of physiological and physical adaptation can only be achieved by developing maximum speed, which is considered a 'physiological' indicator of fitness. According to previous studies and the results of my magisterial and doctoral theses, we have detected a lack of physical appearance and concentration on the factors of maximum aerobic speed during training sessions, and interference in intermittent training. This prompted the researcher to look into this problem in order to find solutions that would help the coach to

develop maximum aerobic speed and enable the player to achieve physical competence on a solid scientific basis.

In order to solve this problem, the researcher wondered about the following:

-What is the impact of short intermittent training (10-20) and (05-25) on the development of maximum aerobic speed of football players ?

-Which of the two methods of intermittent training (10-20) or (05-25) is more effective in developing the maximum aerobic speed of football players?

Hypotheses of the research:

-Short intermittent training (10-20) and (05-25) positively affect the development of maximum aerobic speed for football players.

-The intermittent training method (05-25) develops maximum aerobic speed better than the intermittent training method (10-20) for football players.

Aim of the research:

-To clarify short intermittent training (10-20) and (05-25) and its role in the development of maximum aerobic speed for football players.

-To establish exercises (intermittent training (10-20) and intermittent training (05-25)) to develop maximum aerobic speed for football players as a support for coaches and researchers.

Importance of the research:

-To know the effect of short intermittent training (10-20) and intermittent training (05-25) on the development of maximum speed of football players.

-To know the best way (intermittent training (10-20), intermittent training (05-25)) to develop maximum aerobic speed for football players.

Key words of the research and definition,:

-short intermittent training: is a work from 10 to 30 seconds (work form 30-30) the same period for work and recovery, and among the most common models of training on the field are: 10-10 / 15-15 / 10-20 / 15-45 **...(DELLAL. 2008, P142).**

-maximum aerobic speed(mas): is defined by Cazorla as the speed at which the athlete consumes the maximum amount of oxygen in the sense of reaching the maximum oxygen consumption **(Cazorla 2001, P142).**

-Football: is a Latin word meaning to kick the ball with the foot,The Americans consider it to be what they commonly call "Rugby" or "American football", while the well-known football that is the subject of our study is called "Soccer."

1.Research methodology and procedures:

1.1 Exploration study:

Before undertaking the main study, the researcher studies:

-The reality of physical preparation and coaching in the Algerian football system.

-The coherence of the application of all tests with the level and capacities of the sample and the adjustment of the temporal amplitude of the tests, and this with the order of the test dates.

-Study the effectiveness of the proposed tests and set the dates for their application.

-Complete study of related studies and the most important publications on this subject.

1.2The research Approach:

The researcher used the experimental approach in accordance with the nature of the study for the pre- and post-measurements of experimental groups 1 and 2.

1.3The research population:

The research population represents the category on which we want to carry out the applied study according to the curriculum chosen and appropriate for this

study. In our study, the research community is made up of footballers under the age of 19 years, with a total of 300 players. This category is the one that arouses the most interest, particularly in terms of the football sports legislation decreed by the Algerian federation.

1.4research sample :

The research sample was deliberately chosen from RCR Relizane's under-19 team, based on the same specifications, in particular weight, height and years of play. They were divided into two experimental groups and one standard, with 10 players from each group.

Table No. 1 shows the homogeneity between experimental sample No. 01 and sample No. 02 in the results of anthropometric measurements using Student's T-test.

Significance statistics	Tabular T	Calculated T	Experimental sample 02		Experimental sample 01		
			x	s	x	s	
Not significant	2.10	0.42	0.51	17.60	0.52	17.50	Age
Not significant		1.03	4.50	71.60	3.65	69.70	Weight in kg
Not significant		0.85	5.37	174.8	5.33	173.6	Height in cm
Not significant		0.80	0.96	4.60	0.67	4.30	Age of training
Degree of freedom 09		Level of confidence 95%		Level of significance 0.05		Sample size 10	

1.5Fields of the research:

1.5.1Human field:

The experiment was carried out on the players of RCR Relizane U19

1.5.2 Space field:

The study was carried out at the Zougari Tahar stadium, which is the place of training and official matches of the team.

1.5.3 Time field:

The field experiment ran from mid-July 2019 to 15 November 2019, We determined the duration of the program over 09 weeks, with 2 training sessions per week.

The pre-tests lasted from 11/08/2019 to 12/09/2018.

The post-tests lasted from 07/11/2019 to 11/08/2019 .

1.6 Means of information collection and research tools:

1.6.1Arab and foreign sources and references:

The researcher used Arab and foreign sources and references, scientific journals, the Internet, and similar and related studies whose content revolves around the subject of our research and based on the results and recommendations of national and international scientific forums**.**

1.6.2 Personal meetings:

The researcher conducted personal meetings with national and international coaches as well as federal trainers and specialized professors to obtain data relevant to the research.

1.6.3 Tests:

The researcher determined the physical test to measure the maximum aerobic speed achieved through related studies and to obtain feedback from workers in the training field.

The test used in the experiment:

Test of the University of Bordeau 2 "Cazorla and Bouchet" (TUBE2)

-Target Measure the maximum aerobic speed and maximum oxygen consumption.

-**Tools**: a 200-metre track, plots every 20 metres, 3-minute landing, 1-minute rest between landings. Computer program and mp3 sound amplifier.

Specifications of the test:

The test is performed without warm-up, the pace of the race is increased by 1.5 km/h. This coincides with the loudspeaker which automatically emits a programed sound every 20 metres in a 3 minute phase and then returns, adjusted according to the signals and when the beep is heard, the athlete must be close to the plots. If he is 2, 3 metres late, he stops the test, the aim being to complete as many landings as possible,The landing lasts 3 minutes, and after each landing the athlete takes a minute's rest, and so on.

Figure 1: A 200-metre track for the TUBE2 test

1.7 The scientific foundations of the test:

1.7.1 Stability of the test.

The researcher applied the initial test on a sample of 04 players and repeated the test on the same sample. Then the researcher extracted the simple Pearson correlation coefficient and found that the calculated value was 0.92, which is higher than the tabular value of 0.87, confirming that the tests have a high degree of stability.

1.7.2 Validity of the test.

In order to guarantee the validity of the tests, we calculated the square root of the reliability coefficient It was found that the test has a high degree of validity,

since the calculated value of 0.95 is higher than the tabular value of the Pearson correlation coefficient of 0.87.

1.7.3 Objectivity of the test .

The researcher used a known intermittent easy test for the level of the testers where the target was clarified, and the spatial and climatic conditions that could affect the test results were standardized and the appropriate tools and devices were prepared.

1.8 statistical tools:

To analyze the results, the researcher used the Statistical Package for Social Sciences program (SPSS), Descriptive and Inferential Statistics.

1.9Training program:

The proposed training program was implemented on the basis of the planning philosophy of Dr Farhi, a federal trainer from the Algerian Football Federation, and through contact with coaches and physical trainers through conferences in the field of academic and federal training and through international and national forums based on the following principles:

1-Give special attention to stretching and flexibility exercises at the beginning of the training unit.

2-The exercises selected in the training unit are compatible with the capacities of the members of the research sample.

3-Provide an element of diversity and enthusiasm in the activities and trainings used.

4-The researcher used the short intermittent training method Mixed intermittent training, with ball and without ball.

5-Gradual increase in training loads proportional to the special physical capacities of the research sample.

6-Integrity and integration between the components of the training program by using short intermittent training with the aim of a complete and integrated development of the components of the physical and functional training state of the players.

7- Good codification of the components of the training load (iterations - groups - rest periods between groups) to avoid the phenomenon of overloading.

8-Allow a negative rest period between each group.

9-Performing a group of relaxation exercises in the last part of the daily training unit with the aim of bringing the body back to its normal state.

10-Training of at least 8 minutes for the intermittent training group with 3 repetitions,(exercise 10/20 run 110% VMA for 10 seconds and rest for 20 seconds - Rest 4-5 minutes)

2 -Presenting, interpreting and discussing the results:

2-1 Presentation and analysis of pre- and post-test results for the two research samples:

Table 2: Significance of differences between pre-test and post-test for the research sample in the University of Bordeau 2 TUBE2 test.

Significance statistics	Tabular T	Calculated T	Post-test		Pre-test		
			x	s	x	s	
Significance	**2.**26	5.38	0.26	15.34	0.24	14.64	Experimental sample 01
Not significant		2.24	0.29	15.01	0.48	14.53	Experimental sample 02
Degree of freedom 09		Level of confidence 95%		Level of significance 0.05		Sample size 10	

From the table of differences between the pre- and post-test results of the research sample in the maximum aerobic velocity test, it becomes clear that for experimental group No. 01, the mean value was 14.64 and the standard deviation was 0.24 in the pre-test, and in the post-test it reached an arithmetic mean of 15.34 and a standard deviation of 0.26. The calculated values of T were 5.38, which is higher than the tabular value of T, which was 2.26. This is at the significance level of 0.05 and at degree of freedom 9, which means that there is statistical significance in favour of post-test.

As for the experimental group No. 02, it was given an arithmetic mean of 14.53 and a standard deviation of 0.48 in the pre-test. In the post-test, it reached an arithmetic mean of 15.01 and a standard deviation of 0.29 and the calculated T was 2.24. At the significance level of 0.05 and degree of freedom 9, the value is lower than the tabular T-value estimated at 2.26, indicating that there is no statistical significance, i.e. there is no significant difference between the means of the before and after results.

2-2Presentation and analysis of the post-test results of the two research samples

Table No 2: shows the statistical results and the values of (t) in the post-test.

Significance statistics	Tabular T	Calculated T	Post-test		Pre-test		
			x	s	x	s	
Statistically significant	2.26	2.65	0.29	15.01	0.26	15.34	Test MAS
Degree of freedom 09		Level of confidence 95%			Level of significance 0.05		Sample size 10

It is evident from the table that when comparing the post-test results for the two research samples in the maximum aerobic speed (mas) test that the value of 2.65 is higher than the tabular t-value estimated at 2.26 at the significance level of 0.05 and at degree of freedom 9.

We conclude that the apparent differences in the post-test results in the two research samples were statistically significant in confirming that the short intermittent training method positively affected the development of maximum aerobic speed in football players, with the arithmetic mean of experimental group No. 01 being high compared to experimental group No. 02.

2-3The percentage of improvement between the test results for the two research samples:

Table 3: shows the percentage improvement between the arithmetic means of the maximum aerobic speed test for the two research samples.

Improvement rate	Difference between the two averages	The arithmetic mean of the post-test	The arithmetic mean of the pre-test	
4.50	0.66	15.30	14.64	Experimental sample 01
3.30	0.48	15.01	14.53	Experimental sample 02
Degree of freedom 09	Level of confidence 95%	Level of significance 0.05	Sample size 10	

The above table shows the percentage improvement between the arithmetic means of the maximum aerobic speed test for the pre and post-test for the two experimental groups, where the arithmetic mean of the pre-test was 14.64 and the arithmetic mean of the post-test was 15.30 and the difference between the

arithmetic means of the pre and post-test was 0.66, while the rate of improvement is 4.50% in experimental group 01.

As for the experimental group 02, it reached the pre-test arithmetic mean 14.53 and the post-test arithmetic mean 15.01. The value of the difference between the arithmetic means for pre and post-test was 0.48, while the rate of improvement was 3.30%. This rate of improvement confirms the effectiveness of the short intermittent training method in developing the maximum aerobic speed of football players, especially during exercise (05 - 25), as the rate of improvement was higher.

General discussion:

Thanks to the presentation and analysis of the Cazorla TUBE2 test results, and considering the study aimed at developing the maximum aerobic speed for football players, the researcher succeeded to:

The experimental group 01 obtained statistically significant differences and a high rate of improvement compared to the experimental group 02, and this development is due to the method of short intermittent training (5-25) applied during the basic experiment. Wajdi Al-Tawi states that this method aims to improve starting, development of muscle strength and sustained speed and provides special strength and endurance if the exercise is repeated long enough (Wajdi, Muhammad Al-Tawi, 2002,66). Alexandre Dellal mentions that the exercise varies from 10 to 30 seconds (30/30 exercise form), the same period of work and recovery is one of the most common training patterns in training: 10-10 / 15-15 / 10-20 / -45 ...(DELLAL. 2008. P142). The characteristic of this method through repeated high-intensity effort contributes to the development of speed and the development of maximum aerobic capacity, and it is also clear that the 5-25 short intermittent training method adopted by training group 01 has had a positive impact on the development of the maximum aerobic speed of

VMA, because studies analyzing football activity indicate that a modern football player performs between 40 and 60 repetitions over a distance of 30 metres at a very high speed, confirming the importance of maintaining speed in football and maximum aerobic capacity, which improves the performance of the players during the match and with great efficiency until the end, thus improving aerobic and anaerobic capacities (Mufti Ibrahim, 2000, 345) . The method of intermittent short training applied in our research according to the proposed model has a great role in obtaining positive results This is confirmed by a number of researchers such as: Hervé Assadi from the University of BURGUNDY, who concluded in his study that cross-training 30 sec - 30 sec allows the implementation of large repetitions and works on high excitability for maximum oxygen consumption, and this can be achieved with the greatest possible number of iterations. He made comparisons between the intermittent training method and concluded that the 15s - 15s intermittent training leads to muscle fatigue compared to the 30s - 30s intermittent training while the 60s - 60s intermittent training is greater in the degree of load than the 30s - 30s intermittent training ; which adapts the player to this method, whose organization is similar to what happens during a football match, i.e. work with frequent intense efforts interspersed with periods of rest and recovery (Hervé Assadi, 2012), and as University of Canada researcher Martin Gibala has concluded that the use of intermittent training has the advantage of influencing the improvement and development of aerobic capacity (Martin gibala, 2006). The study by "Ould Hamou Mustapha" was confirmed by research and studies by : Reilly et al, 1992; Dauty and Potiron, 2003; Wisloff et al, 2004, the importance of aerobic continuity, which is a determining factor for excellence in football, as it allows the player to cover a greater distance and recover better

between efforts and to maintain better coordination between the two halves of the game (Ould Hamou Mustapha, 2011).

Based on what was mentioned, the researcher concludes and finds that short intermittent training (05-25) led to the development of maximum aerobic speed at a high rate

Conclusion of the study and suggestions:

Modern football is a game that requires frequent and significant physical effort throughout the stages of the game. The nature of official matches has made precise scientific controls necessary to conduct the sporting season comfortably without lowering the physical level, and this can only be achieved by the unknown soldier who is the "coach" in the team's technical staff, responsible for directing the external load of the players, in parallel with the medical staff, who directs the internal load to preserve the team's safety.

This study deals with one of the problems of physical preparation, which is the clear decrease in the overall level of performance, in particular the lack of repetition of the most important movements in football, in order to repeat the work quickly and with the best performance. The aim of this study was to prepare exercises with the method of intermittent training (10- 20), and (05-25)) to develop maximum aerobic speed for football players and to try to identify the best method of intermittent training (10-20) or intermittent training (05-25) to develop maximum aerobic speed for football players.

On the basis of the results and statistical analyses, the researcher concluded that there are statistically significant differences between experimental groups No. 01 and No. 02 in the post-test variable maximum aerobic speed vma for football players and in favour of experimental group No. 01, and the researcher also found that there are statistically significant differences between experimental groups No. 01 and No. 02 in the percentage improvement between the arithmetic means of the maximum speed test and in favour of experimental group No. 01, means that the first and second hypothesis have been reached,

which means that short intermittent training (10-20) and (05-25) has a positive effect on the development of the maximum aerobic speed of football players, with the preference of the short intermittent training method (05-25), bearing in mind that the subject is still subject to research and study from its different sides.

In conclusion, the researcher believes that coaches and training workers in general should find the best scientific solutions that help players to improve their physical performance and rehabilitate themselves throughout the sports season, as training work today must follow the great development observed in the field of scientific research. And that it is a basic study added to experimental football research and a reference for football researchers and doctors.

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