The impact of a Training Program using some of the Antioxidants on Free Radicals and the skilled performance effectiveness of beach volleyball players

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Research problem and Introduction:

Beach volleyball has its characteristics that distinguish it from the usual volleyball (indoor and open stadiums), in terms of different form of performance of some skills such as first ball reception and preparation, as well as the difference of beach surfaces (sand) from other surfaces (wooden - artificial fibers) Difficulty of physical and skillful performance of players inside the stadium (11: 235)

Abd-Al Basset Mohammed Abd Al-Halim, Ashraf Abd Al Aziz Ahmed (2006) remembered that training on the sand is a means of training to resist the body to the difficulty of movement and used to raise the physiological and physical fitness of the individual to continue performance for a long period (13: 237)

The laboratory scientific researches of sports physiology were concerned with the analysis and study of the open cracks resulting from the oxidation that occurs after high intensity exercises for athletes, where the needs for oxygen increasing to ten or twenty times the need for oxygen during rest and this huge increasing generates the destructive oxygen and when it interacting with important components of cells such as DNA, nucleus, or cell wall leads to poor cell efficiency or its strength and causes some diseases, as well as large role as triggers for muscle rupture and inflammation. (23:57) (5: 83) (20), (10: 83) (21: 205) (1)

Abu Al-Ela Abdel-Fattah and Ahmed Nasr (1993) remembered that antioxidants play an important role in muscle healing as they protect cells and tissues from damage by preventing oxidative stress that leads to muscle damage, which translates into reduced muscle pain and rapid recovery after violent training. Oxidation contained many of vitamins, minerals and herbal enzymes that are available in many food sources. (2: 38)

Lactic acid is an important element in the muscles energy supply , and lactic acid is produced by the anaerobic glycosynthesis of blood glucose, which comes to the muscles through the blood, or through the glycogen stored in the muscle (10: 44-96)

Research problem:

The researcher noted through the currency as the technical director of the Egyptian team of beach volleyball the speed of player feeling tired during the game or training exercises, where each player covered area of 32 m and the

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backs defender defense of more than 60 m individually during the opposing team attack , which is a great burden on the players during the games, by analyzing of previous studies indicates that it based on the use of antioxidants and antioxidant vitamins to reduce the formation of open cracks within the daily diet program for athletes. Therefore, it was necessary to study the effect of using of antioxidants by using a high training program to know its effect on both lactic acid and free electrolytes during rest and after exertion before and after the program and the reflection of this in increasing the effectiveness of skilled performance and reducing the feeling of fatigue in beach volleyball players.

The research aim :

The research aimed to identify the effect of antioxidants using on:

1- The training program impact on the skill performance effectiveness (Blocking - Attak)

2- The proposed training program effect on some biochemical variables.

Research hypotheses:

1- There are statistically significant differences between the pre-post measurements on some skill variables for the Egyptian beach volleyball team players in favor of the post-measurement.

2- There are statistically significant differences between pre and post measurement on some of the biochemical variables of the Egyptian beach volleyball team in favor of post-measurement.

Search procedures:

1 - Research Methodology: The researcher used the experimental method for its suitability to the study nature.

2 -Research community: Beach volleyball players registered with the Egyptian Volleyball Federation.

3 - Research Sample: The sample was selected by the purposive Sample of (6) players representing the Egyptian beach volleyball team facility (1)

Data collection tools:

1- A device (blood samples analysis) to measure the search biochemical variables.

2 -Registration form for age, height, weight, and training age. Annex (2)

3 - The form of skilled performance effectiveness. Annex (3)

The training program structures:

A proposed visibility for the training program was developed to improve the effectiveness of skilled performance through the use of antioxidants for beach volleyball players.

- The proposed training program Foundations:

- The program suitability to the research sample

- the security and safety factor provision.

-the rules of burden and rest Consideration.

-training program content-:

To achieve the proposed training program objective, the proposed training program content has been determined by physical training. * - skill Training * - plans training (Competitive training). Annex (5)

The proposed training program Time division: Through the references review and previous scientific researches, which identified the training programs effectiveness that ranged from 8 to 12 weeks, the researcher constructed the training program through:

Table (1)
The training program time determination by determining unit time and endurance degree

Weeks Number	Unit Time			Number of units per week		the program Total time
10 Weeks	From the first week to the third week	From the fourth week to the sixth week	From the seventh week to the tenth week	From the first to the third week	From the fourth to the tenth week	
	90	120	150	4	5	
	3 x 90 x 4 units	3 × 120 ×5 units	4 × 150 × 5			
sum	1080 min	1800 min	3000			5880

Table (2)
The time distribution of physical, skilled and planner preparation percentage within the training program

Preparation	percentage	Total minutes
Physical	$\frac{30 \times 5880\ \%}{100}$	1764 min
Skilled	$\frac{30 \times 5880\%}{100}$	1764 min
Planning	$\frac{40 \times 5880\%}{100}$	2352min
Program total time		5880 min

Table (3)

Stage		Preparation										Total time	Notes
Periods of Preparation		General Preparation			Preparation			Before competition					
Weeks		1	2	3	4	5	6	7	8	9	10		
Load	max						*	*		*	*		4
	high		*	*		*							3
	average	*			*				*				2
Time of unite		90	90	90	120	120	120	150	150	150	150		
Number of unite per Week		4	4	4	5	5	5	5	5	5	5		
Total time		360	360	360	600	600	600	750	750	750	750		
Total time per Periods		1080			1800			3000					
Time of Physical preparation		60%			30%			10%				100%	
		1080.4			529.2			172.4				1764	
Time of Skilled preparation		30%			40%			30%				100%	
		529.5			705.6			529.2				1764	
Time of Planning preparation		10%			30%			60%				100	
		235.2			705.6			1411.2				2352	

The proposed program was implemented as follows:

The nutritional supplements were used from the of the beginning preparation period until the end of the program before and after the training. The training program was implemented in terms of implementing the training modules according to the schedule.

Procedures Application:

A - Pre measurements:

First: The skilled measurements :

Actual games were filmed between the players before the training program start to measure the skill performance effectiveness before the training program on 10/1/2016 Second: **physiological measurements**:

Physiological measurements were carried out on the following day for the skilled measurements 11/1/2016 through:

- All players Attendance and the specialist doctor to withdraw the samples of the players before and after training completion directly
- Explaining the research importance for the players and the importance supplements using and their impact on some physiological variables and delay the fatigue emergence during training and matches.
- Samples were withdrawn from the players facility (4)

Samples were saved in the designated place and go directly to the analysis laboratory to begin the separation of blood components.

B-The program Application:

• The program was applied during the period from 15/1/2016 to 1/4/2016.

C- Post measurements:

First: The skill measurements: The special matches were filmed to measure the skill performance effectiveness on 1/4/2016

Second: physiological measurements :

The players Samples were withdrawn at the time of rest and after training on 2/4/2016

- Statistical treatments: The researcher processed the data statistically using the following statistical analysis:

1. The arithmetic mean.
2. The standard deviation
3. The skewedness.
4. Percentage.
5. Improvement rate.

the results presentation and discussion:

Through the first hypothesis achievement through the existence of statistical significant differences between the pre-post measurement in the skill performance of the beach volleyball Egyptian team players in favor of the post measurement and this is what we will explain in the results interpretation of

block and smash:

First: the smash skill

Table (4)

The search sample players percentage in the smash pre- post measurement

players	Match(1)																	
	(1) Player			(2) Player			(3) Player			(4) Player			(5) Player			(6) Player		
	Percentage within stroke ss set			Percentage set within stroke			Percentage within stroke set			Percentage within stroke set			Percentage within stroke set			Percentage within stroke Set		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Before	60	59.4	60	66.7	62.5	56.7	50	66.7	55.6	53.3	50	–	53.3	51.1	49.3	55.6	60.4	–
after	61.9	80	77.2	76	65	57.1	61	75.7	56.1	75.7	64.3	–	66	64.3	70	61	65	–
Players	(1) Match																	
	(1) Player			(2) Player			(3) Player			(4) Player			(5) Player			(6) Player		
	Percentage within stroke			Percentage within stroke			Percentage within stroke			Percentage within stroke			Percentage within stroke			Percentage within stroke		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Before	50	50.1	64.3	53.3	60	68.2	53.3	50	55	56.7	57.1	-	63.9	50	61.1	50	58.3	-
after	65.6	56.5	66.7	65.4	68.8	72.4	62.5	68.9	70.8	72.1	71.4		71.4	55.5	64.3	66.7	79.2	-

Table (4) shows that there are statistically significant differences in the research sample players percentage in the pre-post measurement in favor post measurement

Table (5)

The skill performance effectiveness and improvement rate average for the search sample players in the smash pre-post measurement

players	Match Number (1)																	
	Player No 1			Player No2			Player No 3			Player No 4			Player No 5			Player No 6		
	improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average		
	pre	post	improve	pre	post	improve	Post	pre	improve	pre	post	improve	pre	post	improve	pre	post	Improve
	59.8	73	22	62	66	6.5	57.4	64.3	12	54.2	70	29.1	51.1	66.8	30.7	58	63	8.2
players	Match Number (2)																	

	Player No 1			Player No 2			Player No 3			Player No 1			Player No 2			Player No 3		
	improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average		
	pre	post	improve	pre	post	improve	Pre	post	improve	pre	post	improve	pre	post	improve	pre	post	Improve
	55.1	62.9	14.2	60.5	68.9	13.9	52.8	67.4	27.7	56.9	71.8	26.2	58.3	63.5	8.9	54.1	73	34.9
Players average	57.5	68	18.3	61.3	67.5	10.1	55.1	65.9	19.6	55.6	70.9	27.7	58.7	65.1	10.9	56.1	68	21.2

Table (5) shows that there are differences between the averages of the skill performance effectiveness between each player in the pre-post measurement in favor of the post measurement, as well as increasing the percentage of improvement in the performance effectiveness of the player alone and the whole team as in pre-post measurement in favor of post measurement.

First: smash

Table (4) match (1) for smash players percentages in the pre measurements ranging from (49.3% -66.7%), while this percentage increased in the post measurements to rang between (56.1% - 80%).

Table (4) of match (2) shows the percentages of the smash player's percentage in the pre measurements, ranging between (50-68.2%), while this percentage increased in the post measurements to range between (55.5% - 79.2%).

Table (5) for the skill performance effectiveness averages of players in the pre-measurements match (1) and (2), shows that the effectiveness average ranged between (51.1% - 61.3), while we find an increasing in the players average percentages in the post measurement to range between (65.1% - 70.9%).

Table (5), for the skill performance effectiveness, shows the improvement rate for players in match (1), which ranged from (6.5% to 30.7 %.) Also, Table 6 shows the skill performance effectiveness improvement rate for players in match (2) which ranged between (8.9% and 34.9%). Also Table (6) of the improvement rates between the averages of the skill performance effectiveness of the players in the pre and post measurements cleared that they ranged from (10.1% to 27.7%).

Table (6)

The search sample players percentage in blocking pre –post measurements

players	Match(1)																	
	Player No 1			Player No2			Player No 3			Player No 4			Player No 5			Player No 6		
	Percentage within stroke			Percentage within stroke			Percentage within stroke			Percentage within stroke			Percentage within stroke			Percentage within stroke		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Before	46.9	57.7	55	55.6	44.4	52.9	46.9	55	53.3	51.1	55	–	63.3	50	42.2	48.6	5303	–
After	57.6	68.6	64.7	60.6	62.6	63	72.9	71.1	58.3	57.6	72.3		78.3	73.1	62.5	56.3	62.7	–
Players	Match(2)																	
	Player No 1			Player No2			Player No 3			Player No 4			Player No 5			Player No 6		
	Percentage within stroke			Percentage within stroke			Percentage within stroke			Percentage within stroke			Percentage within stroke			Percentage within stroke		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Before	46.7	55	50	56.6	56.6	48.9	60.4	53.3	55	52.1	57.1	–	52.5	56.7	60	66.7	55.6	–
after	69.6	66.7	72.5	60.6	62.8	73	68.8	78.3	62.7	60.6	72.9	–	68.6	62.4	73.8	72.1	62.4	

Table (6) shows that there are statistically significant differences in the percentage of the research sample players in the pre-post measurement in favor of the post measurement.

Table (7)

The search sample players percentage in blocking pre –post measurements

players	Match Number (1)																	
	Player No 1			Player No 1			Player No 1			Player No 1			Player No 1			Player No 1		
	improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average		
	pre	post	improve	pre	post	improve	post	pre	improve	pre	post	improve	pre	post	improve	pre	post	Improve
	52.2	63.6	21.8	51	62.1	21.8	51.7	67.4	30.4	53.1	64.9	22.2	51.8	71.3	37.6	51	59.5	16.7
players	Match(2)																	
	Player No 1			Player No 2			Player No 3			Player No 1			Player No 2			Player No 3		

	improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average			improvement ratio and effectiveness Average		
	pre	**post**	**improve**	**pre**	**post**	**improve**	**post**	**pre**	**improve**	**pre**	**post**	**improve**	**pre**	**post**	**improve**	**pre**	**post**	**Improve**
	50.6	69.6	37.5	54.1	6505	21.1	56.2	69.9	24.4	54.6	66.8	22.3	56.4	68.3	21.1	61.2	67.3	9.9
Players average	51.4	66.6	29.6	52.6	63.8	21.9	54	68.7	27.2	53.9	65.9	22.3	54.1	69.8	29	56.1	63.4	13.1

Table (7) shows that there are differences between the skill performance effectiveness averages between each player in the pre -post measurement in favor of the post measurement, as well as the improvement percentage increasing in the player performance effectiveness alone and the whole team in pre-post measurement in favor of post measurement.

Second: blocking

Table (6) of match (1) shows, for blocking players, the percentage in pre measurements which ranged from (42.2% -63.3%), while this percentage increased in post measurements to range between (57.6% and 73.1 %.)

Table (6) of match (2) shows the percentage of blocking players in the pre measurements, which ranging between (46.7% -66.7%), while this percentage increased in the post measurements to range between (60.6% - 78.3%).

Table (7) shows the average of the players skill performance effectiveness in the pre measurements match (1) and (2), where the effectiveness average ranged between (51.4% - 56.1), while we find an increasing in the players averages in the post measurements between (63.8% - 69.8%)

Table (7) shows the improvement rate in the player's skill performance effectiveness in match (1), which ranged between (16.7% to 37.6%)

It is also evident from Table (7) the improvement rate in the player's skill performance effectiveness in match no. (2), which ranged between (9.9% to 37.5%)

Table (7) explained the improvement rates between the averages of the player's skill performance effectiveness in the pre and post measurements, which ranged between (13.1% to 29.6%).

researcher returned the increasing of the players percentages and improvement ratios between the pre and post measurements in blocking, to the training program, which was able to increase physical ,skill and planning abilities by increasing the ability to continue in jumping and performing skill with high efficiency in balls end and the plan act ability and high rates of achievement The direct points and errors increased as a result of players concentration in the performance of both smash and blocking as a result of the

dietary supplements effect that have been able to increase the players ability to continue in performance for long periods during the match without feeling tired and this was confirmed by both Ahmed Shaarawy 2007, Nasser Amer Suleiman 2009, Mohamed Saad Ismail, 2005 Azizow 1998, and Moayad AbdAllah (2010) and Ahmed Hassanein (2011) Ahmed NourAl -ddine 2012, and Ahmed Mohammed AbdAllah 2011.

Second: through achieving the existence of statistical significance differences between the pre and post measurement in some of the biochemical variables of the beach volleyball Egyptian team players in favor of post measurement

Table (8)
The differences significance between the mean scores and the change percentage in the pre and post measurements in some of the search sample biomechanical variables N=6

variables	Measures		Measure unit	pre		post		Average different	T.value	Differed percent
				m	std	m	std			
biomechanical Variables	Lactic acid	Pre	m.mol	2.28	0.49	1.28	0.17	1	5.22	43.86%
		post		7.70	0.54	4.38	0.41	3.32	21.89	43.12%
	Free Radicals	pre	m.mol	11.65	1.35	7.65	1.24	4	10.95	34.33%
		post		25.17	1.76	18.17	1.42	7	15.65	27.81%
	Antioxidants	pre	m.mol	2.67	0.43	4.97	0.57	2.3	10.96	68.14%
		post		3.85	0.65	7.67	0.54	3.83	23.11	99.22%

The T value at (0.05) = 2.015

Table (8) showed statistically significant differences between the mean scores of the pre and post measurements in the biochemical variables, as follows:

* For the first variable, lactic acid, where the value of calculated (t) before the effort (5.22) and the differed percentage (43.86%). After the effort, the calculated (T) value (21.89)

The differed rate (43.12%), and these changes were in favor of post measurement, whether during rest or after effort

the researcher attributed the improvement in the reduction of the lactic acid proportion in the blood to the effect of the training program, which contains high intensity training through the performance nature on sand ,the movement difficulty and large area of the stadium, which due to a high intensity on the player during the exercises or matches, this due to the blood chemical state improvement and the ability of the body to get rid of the large increasing of

blood lactic acid during the high intensity physical effort performance with using of antioxidants, which is important in players bodies protection of (12, 18, 19)

* **There is decreasing in the blood free radicals concentration percent**, for the second variable, in the pre than the post measurement, where the value of calculated (T) before the effort (10.95) and the change percentage (34.33%). After the effort, the calculated (T) value was (15.65) the change rate (27.81%). These changes were in favor of post measurement, whether during rest or after exertion. free radicals resulting from the violent physical performance , which is one of the causes of muscle damage and tear, as the violent exercises practicing generate oxygen atoms as a result for oxygen increasing consumption within the mitochondria with the lipids oxidation , and that the antioxidant enzymes have the ability to oxidize these radicals and get rid of it during the training Hence, the importance of antioxidant supplements in the protection of muscles during the high intensity training . This is confirmed by both Mohammed Saad Ismail (2005) and Dr. Eman Al - Sisi 2004.

***there is increasing in the blood antioxidants concentration** ,according to The third variable , where the value of calculated (T) before the effort (10.96) and the percentage of change (68.14%), after the effort calculated (T) value was (23.11) and the change percentage (99.22) %) in favor of the search sample post measurements . Where we find a rise in the blood antioxidants concentration percent which the researcher returns to the regularity in giving the special dose for each player before and after training doses, which had the best effect in protect cells and muscle Fibromyalgia from damage, and increasing the body ability to inhibit the cracks during high intensity physical effort.

Ahmed Shaarawy 2007, Nasser Amer Suleiman 2009, Mohamed Saad Ismail 2005 Azizow 1998, Iman Sisi, Schroeder 2000, guilo 2004 confirmed that.

CONCLUSIONS:

The researcher, In light of the research objectives, questions and procedures followed by, concluded the following:

1 -There are statistically significant differences between the pre and post measurement on some skill variables for the beach volleyball Egyptian team players in favor of the post-measurement.

2 - There are statistical differences between the pre and post measurement on some of the biochemical variables of the of the beach volleyball Egyptian team players in favor of the post-measurement.

Recommendations:

The researcher recommends the following In light of the research results:

1- The proposed training program application and dissemination to beach volleyball players.

2- This is the first study which used antioxidants in beach volleyball

3- The continuous focus on training programs forming that serve as a guide for players and trainers

4-increasing the researches and studies that concerned with the physiological aspects of beach volleyball.

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