The effect of continuous physical pregnancy on some physiological and physical variables and the digital level of female specialists in swimming

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1-Introduction and research problem:

Regular sports training leads to positive responses to humans, including physical, physiological, psychological, and strength of movement. One of the most important effects that sports training brings is on the cardiovascular system and the recent research that has studied the impact of regular sports training on the cardiovascular system has shown different results depending on the intensity, duration, or the rate of training also the physical and physiological conditions of athletes.

This is clear in the sport of swimming, which is one of the types of water sports, and it is the first basis for it and without mastery, the individual can not practice in the water environment where the energy consumption during swimming exceeds any type of activities with a single movement and the reason for this is due to the amount of Energy consumed.

The strength of the swimmer's muscles increases as a result of the training, as swimming is characterized by the participation of all the main muscles in the muscle work

Carrying training depends on codifying it on many factors, the most important of which are the intensity, duration of exercise, how the muscular work, as well as the player's physiological and physical capabilities and his training and biological age and the stage of development that he passes, all of these factors must be taken into account when codifying the training load or when planning for physical

loads, and that is what Corresponds to the player's physiological and biological capabilities.

And there is a fine mistake that separates the organized physical pregnancy based on scientific foundations that leads to raising the efficiency of the different systems of the body, including the immune system, and the high-intensity physical pregnancy, which is an attack on the various body systems, and it causes a relative decline from the state that had to be recovered.

Tolerance is one of the most important elements of fitness for swimming and Bahauddin Salama (2000 AD) said that tolerance is the ability of the body to tolerate exercise for a long time and tolerance is that component or the component that includes two different elements, but they are closely related (cardiovascular respiratory tolerance) and (muscular tolerance), both of which make a direct contribution to swimming.

As it is a product of high air capacity and is linked to the cardiovascular and respiratory devices that the swimmer needs to a great extent in the distance of 400 m or more, and therefore the air capacity is the ability to consume and transport and use of oxygen, which is measured by the maximum consumption of oxygen (Vo2max) and swimmers must be characterized by high and special air capacity specially in long distance races.

There are types of tolerance, which are aerobic and anaerobic tolerance, speed tolerance, basic tolerance, tolerance strength, and the threshold difference tolerance, and the maximum oxygen consumption tolerance.

(tolerance = the ability of the body to resist fatigue + rapid hospitalization) and the ability to tolerance in terms of practical and scientific aspects and multiple forms that must be taken into account to the different scientific standards between them.

One of these clear scientific criteria that have to do with the type of muscular action used in these events and sports is the requirements for energy supply systems , so it is necessary to differentiate between two main types of this tolerance capacity which is called aerobic and anaerobic endurance

During the sport effort, especially tolerance training, the need for oxygen increases continuously with increasing high speeds. however, the amount of high oxygen reaches the maximum level that no effort can pay, as the amount of oxygen has reached its maximum level and will remain constant just because it cannot raise more than that due to Restrictions on the circulatory system and respiratory system.

And that the maximum oxygen consumption is limited to blood circulation and the respiratory system, and the level of physiological ability values in men is about 40-60% higher than that of women. Also, the average values of this ability among untrained youth is about 3.5 l / min and about 45 mL / kg / min. Also, the average value of this ability for untrained women is about 2 liters / minute, or about 38 ml / kg / minute, and these calculated values can change a lot from their rates, so they increase and improve a lot with training, and decrease with age.

Also, the rates of change that occur during training vary between one type and another, where the value of this ability doubles in some athletes in the preparation periods a lot, while in others, there is no improvement or change with only a few.

The maximum oxygen capacity (VO2max) for athletes in games and tolerance activities is one of the most important elements and components of their athletic achievement, such as activities and games of bicycle racing, rowing of all kinds, long-distance skiing, swimming, and running track and road games , And the maximum oxygenated capacity measurements for athletes are at the highest levels in these events. The rate of this ability among men is high in

sports for long-term cycling and skiing 75 ml / kg / minute, and among the excellent, among them, 85 / ml / kg / min.

Evidence indicates that VO2max improves with training, as research has shown that genetics is one of the determinants of identifying the amount of improvement for each individual. That is, for every kilogram of body weight, the amount of improvement will be between 20% - 40%.

Determining the ability to consume oxygen during the past several years was considered a good measure to estimate the ability of the athletic individual to perform tolerance races, and we support that the athletic individual who possesses his working muscles with more oxygen every minute of the exercise will undoubtedly be able to own more Of the energy from the airway.

therefore, the athletic individual can reach the stage of fatigue at lower rates due to his dependence on performance with a lower degree of anaerobic representation. The higher the amount of Vo2max for an individual athlete, the better his chance in endurance races, and for this reason, the endurance training confirmed the improvement of this physiological scale.

It has become a accepted fact that the more improved VO2max, the better this physiological scale has become. It has become a accepted fact that the more Vo2max improves the level of individual performance of endurance.

Several studies indicated that there is a strong relationship between VO2max and the level of endurance performance.

The researcher saw that there are few studies that indicated the effect of continuous physical pregnancy on the physiological and physical characteristics of the athlete and this prompted the researcher to carry out this study to see if the regular high-intensity tolerance training for students of the Faculty of Physical Education for girls in the island for a period of (a month) will lead to changes.

Physiological measurement of the strength of the muscles of the legs and arms, which gives an indication of the improvement that may occur in the digital and physiological level, with that physical load.

2-Research objective:

This research aims to identify each of: -

1- The effect of continuous physical tolerance on some physical and physiological measurements (arm strength - leg strength - maximum oxygen consumption)

2- The effect of continuous physical pregnancy on the digital level.

3-Research Assumptions

1- There are statistically significant differences between the pre and post measurements in the physical and physiological measurements (arm strength - leg strength - maximum oxygen consumption).

2- There are statistically significant differences between the pre and post measurements at the numerical level in favor of the telemetry.

Search procedures :

First: Research Methodology:

The researcher used the experimental approach to design the single experiment with pre and post measurement for suitability and nature with this research

Second: The research sample:

1- Research Society:

The research sample consisted of students of the fourth year of swimming specialization in the Faculty of Physical Education for Girls of Helwan University for the academic year (2016-2017) and they were (12) students.

2- Research Sample:

The researcher chose the sample of the research in an intentional way, as the research sample consisted of students of the fourth year at the Faculty of Physical Education for Girls for the academic year of the university (2016-2017) and divided as follows:

- (2) students to conduct the exploratory experiment from the same research community and from outside the sample.

- (10) students, to conduct the main experiment.

Tables No. (1-2-3) show the statistical characterization and sample equivalence in the variables (age, height, weight) and physiological and physical variables (the maximum oxygen consumption, the two muscles strength, the arms of the arms of the arms) and the digital level.

Table (1)

Statistical characterization and parity of the sample population in variables

(Age - height - weight)

Randomization		Normality		$\propto_3$	S	$\bar{X}$	Measuring unit	Variables
P- (value)	Z	P- (value)	Z					
1.00	**0.00***	0.69	**0.71***	1.48	0.57	20.08	**year**	Age
0.11	**-1.62***	0.63	**0.75***	1.11	4.29	168.20	**cm**	height
0.36	**-0.91***	0.79	**0.65***	-0.49	3.06	57.25	**kg**	weight

*** Indication at the value of (p) <(0.05)**

Table (1) shows the arithmetic mean, the standard deviation and the torsional coefficient of the research sample in variables (age - length - weight), and the data indicate that the torsional coefficient values for the research sample are limited to (+3), which indicates that the sample data does not have positive or negative torsions. As well as the presence of statistically significant differences in the values of random and natural tests, which indicates their normal and random distribution, which confirms the parity of the sample members.

Table (2)

Statistical characterization and parity of the sample population in some physiological and physical variables

N=10)

Randomization		Normality		$\propto_3$	S	$\bar{X}$	Measuring unit	Variables
P- (value)	Z	P- (value)	Z					
0.83	**-0.21***	0.36	**0.93***	-0.31	99.30	450.00	s/m	Maximum oxygen consumption
0.74	**-0.34***	0.99	**0.42***	0.20	2.74	21.85	kg	Leg muscles strength
0.74	**-0.34***	0.85	**0.61***	0.48	1.79	9.90		arm muscles strength

*** Indication at the value of (p) <(0.05)**

Table (2) shows the arithmetic mean, the standard deviation and the torsional coefficient of the research sample in some physiological measurements, the maximum limit of oxygen consumption, the physical measurements of the endurance and the strength of the muscles of the arms of the legs. There are no positive or negative contortions in it, as well as the presence of statistically significant differences in the values of random and natural tests, which indicates

their normal and random distribution, which confirms the parity of the sample members

Table (3)

Statistical characterization and parity of the sample in the numerical level of swimming

(N = 10)

Randomization		Normality		$\propto_3$	S	$\bar{X}$	Measuring unit	variables
P- (value)	Z	P- (value)	Z					
0.74	**-0.34***	1.00	**0.37***	-0.08	6.07	29.08	s	Digital level

*** Indication at the value of (p) <(0.05)**

Table (3) shows the arithmetic mean, the standard deviation and the torsional coefficient of the research sample at the digital level, and the data indicate that the torsional coefficient values of the research sample are between (+3), which indicates that the sample data do not have positive or negative torsions, as well as having statistically significant differences in The values of random and natural tests were evaluated, which indicates their normal and random distribution, which confirms the parity of the sample members.

Third: The means of data collection:

It includes the following:

1- Tools 2- Devices 3- Tests 4- Measurements

1- Tools:

- Ropes to split pools into long lanes.

- 4 stop watch.

2- Devices:

A- The swimming pool (25 m)

- Al-Rastamir device for measuring height in centimeters.

- A medical scale to measure weight in kilograms.

- The dynamometer

3- the tests :

- Test the muscles strength of the legs (in dynamometer).

Arm muscle strength test (modified oblique flatness of girls)

Cooper test (12 minutes).

Digital Level Tests:

The digital level was measured by measuring the time in a continuous 1 km swimming pool and it was estimated by the minute / second for each student by measuring the stopwatch.

4- Measurements

A- Body measurements:

The length was measured using a Restaeter to measure the total length of the nearest cm.

The weight was measured using a medical scale device to measure the weight of the nearest kilogram.

B - Physical and physiological measurements:

1- Measuring the strength of the muscles of the arms (in dynamometer).

2- Measuring the muscle strength of the legs (in dynamometers).

3- Measuring the maximum oxygen consumption (Cooper test 12 mins)

• From 1977 to 1982, Cooper prepared the swimming test for 12 mins to cut the largest possible distance in any of the swimming methods preferred by the tester, and to allow tester swims with comfort during performance if there is a need for that. The important thing is that the tester makes the utmost effort to cut the largest A possible distance during a time of 12 minutes, and it is noted that the test is conducted in a well-known swimming pool so that the total distance covered by the tester can be calculated by multiplying the length of the bathroom by the number of times coming and going, and the table shows the levels of fitness (aerobic fitness) compared to the distance of the swimming that traveled The laboratory during the time of 12 mins.

•**preexperimental measurements**: The researcher conducted the preexperimental measurements of the (experimental) research group as follows:

On Sunday 10/22/2017 AD, the muscle strength of the two men was measured by a dynamometer in a unit of kilogram measurement and a measure of the maximum force that the student could produce in the existing batch when performing the test and measuring the strength of the muscles of the arms using the oblique modified flatness of the girls and calculating the number of repetitions during 1 minute and that In the physiological laboratory of the Faculty of Physical Education then take a break for 30 mins, then measure the Copper test for 12 minutes and calculate how many meters each student of the research sample made during the 12 mins to calculate the maximum oxygen consumption.

On Monday, corresponding to 10/23/2017, a 1-kilometer swimming pool is connected and the time taken by each student of the research sample is measured in a unit of measurement s / s, to calculate the digital level for each student.

Program application:

Endurance training has been applied at (75%) level of VO2max for (20) minutes and for (4) times per week for a period of four weeks, bringing the number of units throughout the training period (20) training units.

The researcher started the application on Sunday 10/22/2017 to Sunday 3/12/2017 from 9 AM to 10:30 AM on Sundays, Mondays, Wednesday and Thursday.

The first week from 10/22/2017 to 10/26/2017, on Sundays, Monday, Wednesday and Thursday, where students of the research sample from specialization students in swimming warm up under the supervision of 2 teachers from the swimming department, then go down to the water and warm up inside the water and then start Swimming connected for a period of 10 s without resting strongly 75%, from 9 am to 9:45 am.

The second week, from 10/29/2017 to 11/2/2017, during the same specified days to apply the experiment, where students of the research sample from students specializing in swimming warm up under the supervision of 2 teachers from the swimming department, then go down to the water and warm up inside the water, then start swimming Connected for a period of 15 s with a 75% intensity without rest, from 9 am to 10 am.

The third week and the fourth week from 11/5/2017 to 11/16/2017, and in the same specified days, they applied the experiment where the students of the research sample from the students of specialization in swimming warm up under the supervision of 2 professors of the swimming department and help the researcher, then go down to the water and warm up inside Water, then start the continuous swimming for 20 s 75% without rest, then calm the students, from 9 am to 10 am.

Dimensional measurements:

Dimensional measurements of the experimental group were performed with the same **preexperimental** measurements:

On Sunday 12/12/2017 AD, the muscle strength of the both legs was measured by a dynamometer in a unit of kilogram measurement and a measure of the maximum force that the student could produce in one lot at the top when performing the test and measuring the strength of the muscles of the arms using the modified oblique flatness of the girls and calculating the number of repeats during 1 minute, And that is in the physiological laboratory of the College of Physical Education for Girls and then took a break for 30 s and then measuring the Cooper test for 12 minutes and calculating how many meters each student of the research sample made during the 12 mins to calculate the maximum oxygen consumption.

On Monday, 4/12/2017, a 1-kilometer swimming and calculating the time taken by each student of the research sample in a unit of measurement s / s, to calculate the digital level for each of the students of the research study.

Statistical treatments used:

The researcher used SPSS to calculate the following statistical treatments:

- SMA **(X)**
- standard deviation **(S)**
- Torsional coefficient **($\propto_3$)**
- normal distribution test (Kolmogorov-Smirnov) **(Z)**
- randomness test (Runs Test) **(Z)**
- Difference test (t – test)
- Correlation coefficient **(r)**
- Ratios of improvement

Presenting and discussing the results: -

Table (4)

An indication of the differences between the pre and post measurements in some physiological and physical variables

(N=10)

*** Indication at the value of (p) <(0.05)**

Improvement rate	P (value)	t	Difference	post		pre		Measuring unit	Variables
				S	X	S	X		
%33	0.0	***18.00-**	150	104.75	600	99.3	450	s	Maximum oxygen consumption
%54	0.00	***57.94-**	11.85	2.35	33.70	2.74	21.85	kg	Leg muscles strength
%102	0.00	***23.31-**	10.10	1.63	20.00	1.79	9.90		arm muscles strength

It is clear from Table (4) that there are statistically significant differences between the pre and post measurements in some physiological and physical measurements (the maximum oxygen consumption and the strength of the muscles of the legs and arms, and the rates of improvement are between (33% -102%)).

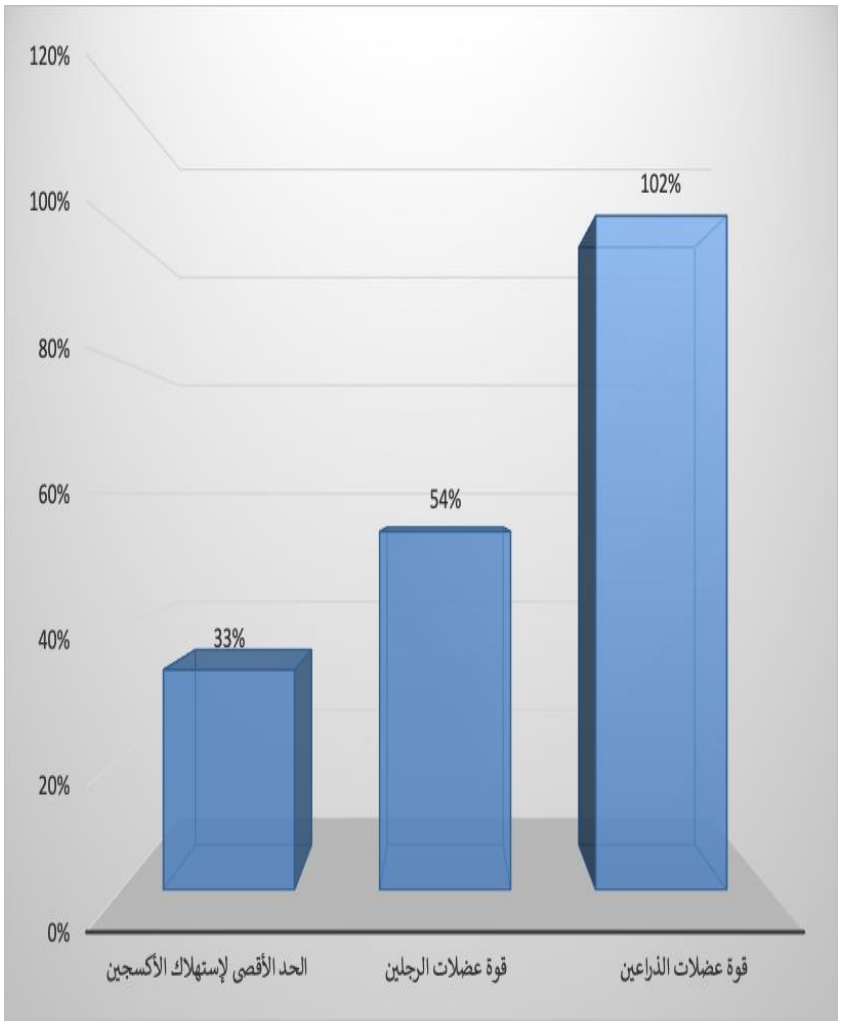

Figure (1)

The rates of improvement of the dimensional measurements of tribalism in some physiological and physical variables

Table (5)

An indication of the differences between the pre and post measurements in the digital level of swimming

(N =10)

Improvement rate	P (value)	t	Difference	post		pre		Measuring unit	variables
				S	$\overline{X}$	S	$\overline{X}$		
48%	0.00	**11.38***	9.40	4.58	19.67	6.07	29.08	S	Digital levels

*** Indication at the value of (p) <(0.05)**

From Table (5), it is clear that there are statistically significant differences between the pre and post measurements in the digital level of swimming.

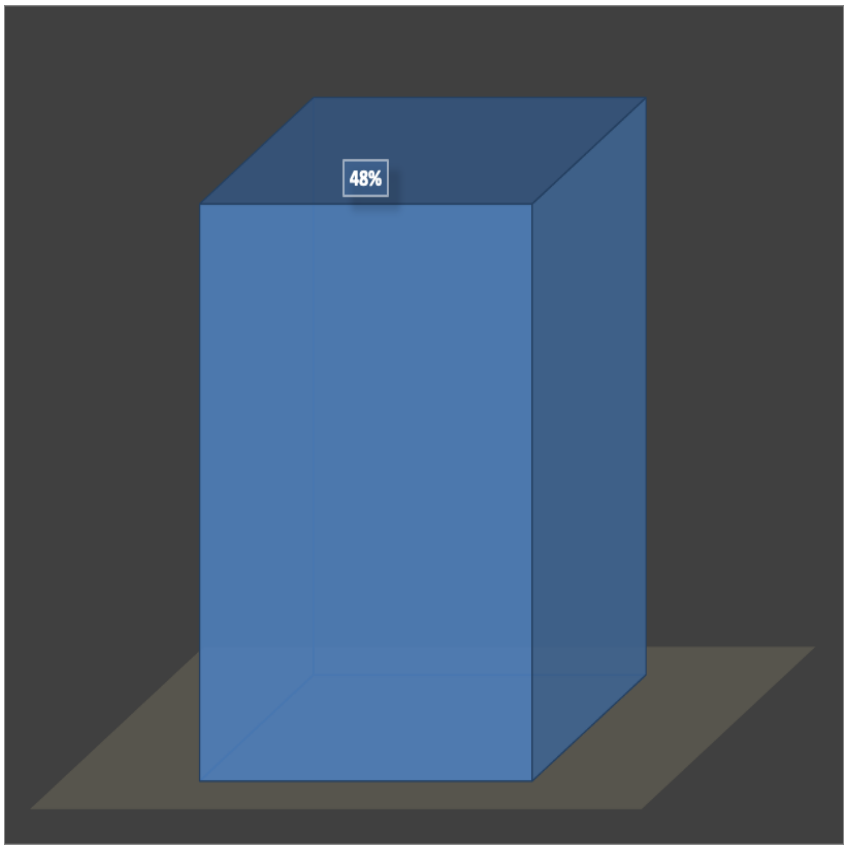

Figure (2)

The rates of improvement of the pose measurements from pre in the digital level of swimming.

Second: Discussing the results:

The results of the research showed that there are statistically significant differences in the variables in the research, and here the researcher called for an attempt to explain the results.

discussing the first Assumption, which states:

"There are statistically significant differences between the pre and post measurements in both the maximum oxygen

consumption and physical measurements (arm strength - leg strength)"

It is clear from Table (4) that there are statistically significant differences between the pre and post measurements in both the maximum oxygen consumption and some physical measurements of tolerance and the strength of the muscles of the legs and arms. In the oxygen capacity.

Where this is consistent with Abu Al-Ella Abdel-Fattah (2003), that aerobic fitness represents the maximum ability to take oxygen and transport and use it, as it is measured by a test called the maximum oxygen consumption, where most researchers indicate that Vo2max (the maximum oxygen consumption) is related to performance in tolerance training with enzyme activity Oxidized in the mitochondria where continuous pregnancy training helps increase these enzymes, which helps to increase the consumption of oxygen. The improvement in oxygen consumption also results from an increase in blood volume, cardiac impulse, and the ability of muscles to consume oxygen.

(Green 1996) indicates that there is a significant relationship between Vo2max and the level of performance in long races, and that continuous training occurs adaptation that increases the rate and volume of oxygen released to the muscles as the spread of pulmonary oxygen inside the blood stream increases and leads to an increase in hemoglobin stored in the muscle fibers and increase the size and number of mitochondria and increase Enzymes that regulate metabolism

This is in agreement with "Muhammad Hassan Allawi, Issam Abdel-Khaleq, Muhammad Ali Al-Qat, Sayed Ahmed and Bahaa Al-Din Salama" that athletic training improves the efficiency of muscle work in the body.

The researcher attributed the improvement in the strength of the arms and legs to the continuous exercises that led to blood

circulation and stimulation, and the feeding of working muscles and the increase of their physiological efficiency, which led to the increase in the strength of the muscles of the legs and arms.

And "Waller" and "Hayley" indicate that water is more resistant to air and noticeably more concentrated than air - approximately 800 times. This means that you can build muscle strength as you move into the water

This is consistent with both “Spestin and Dyder (2007) and Ahmed Mohamed Hassan (2016)” that long-term training in water has actually proven more effective compared to training on the ground to build muscle strength

Hence, the first hypothesis was achieved, which states that there are statistically significant differences between the pre and post measurements in the physical and physiological measurements (arm strength - leg strength - maximum oxygen consumption).

Discussing the second hypothesis, which states:

"There are statistically significant differences between the pre and post measurements at the numerical level in favor of the telemetry"

Table Table (5) shows the presence of statistically significant differences between the pre and post measurements in the digital level of swimming in favor of the dimension measurement.

The researcher attributed this improvement to the training used and an improvement in physiological efficiency and stimulation of blood circulation, which led to an improvement in the work of the muscles that were fed with the necessary blood loaded with oxygen and thus an improvement in the digital level

This is consistent with "Bahjat Abu Tamei 2009" that the development in the digital level depends mainly on achieving the adaptation process

for the body's systems so that the swimmer can perform at the highest possible level. Therefore, the training process must take place within the framework of a proper understanding of the physiology of sport in order to achieve the required adaptation and thus obtain the progress of the digital level it aims to. The swimmer's training should also depend on the applications of energy production systems.

This fulfills the second Assumption, which states that there are statistically significant differences between the pre and post measurements at the numerical level in favor of the telemetry.

Conclusions and recommendations:

First: the conclusions

In light of the research objectives and hypotheses and within the limits of the sample and discussion of the results, the following conclusions were reached: -

There are statistically significant differences between the pre and post measurements of the experimental group in some physiological, physical and digital measurements.

Second: Recommendations

Based on the research results and their discussion, the researcher recommends the following: -

1- Carrying out similar studies in different age stages competitions.

2- Conducting similar studies on males with an increase in the dose of exercises.

3- Training for a sufficient period to ensure adequate adaptation.

4- Increasing training times a year more than once, which may reach three times to increase adaptation.

5- Take into account the codification of the rest periods necessary to recover the hospitalization completely.

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