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Study on the effect about doping in evolution of 100 meter world records

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ABSTRACT

100 meters race is one of the movement project, which carried out is earlier, own characteristics of Encourage competition, and Ornamental. Now, there are many factors that influence the evolution of 100 meter world records, For example doping, which is most representative. Since human society entered in 21st Century, the event that about 100 meters running stimulant abuse always happen. For example, the men's 100 meters world record holder, Jamaica's Boulter, constantly refresh men's 100 meters world record. Many Authoritative sources suspicion on Boulter use the Doping to keep men's 100 meters world record. However, experts in medical field declared: "Doping is useless in 100 meter race." this paper base on the development process about 100 meters world record and characteristics, analysis the influence of doping in the 100 meters world race in evolution, and puts forward some opinions and suggestions.

KEYWORDS

100 meters race; World record; Doping.

INTRODUCTION

Since human society entered in 21st Century, athletics sports became increasingly socialization, political, commercial, for example 100 meters race, which is Competitive, ornamental and commercial. 100 meters race challenges the limit of human beings, human star to study deeply it. However, a new 100 meter world record was born, will appear the doping events that related with the 100 meter race. On the eve of the 2013 World Championships, Athletics field has been incredible blew, American famous athlete Tyson Gaye who former world record holder, Jamaica's Boulter are both into doping scandals[1]. The IAAF finally enforces the punishment before the 2013 World Championships that first offenders punishment period from 2 years to 4 years from January 1, 2015. Although IAAF enforces the punishment about stimulant abuse, doping has been keeping close contact with 100 meters race.

Doping overview

Firstly, the definition of doping in sports

" Dope " which Originated in the wine has a strong function in South African black dialect. Dope is an opium anesthetic mixture for racing around 700 BC, then which often use in sports, can stimulate the nervous system of human or animal, make a person or animal produce excited, improve exercise capacity. Historical data shows: The appropriate use of stimulants is beneficial to athletic performance, especially in the Period that level of training and nutrition is low. Opium is the first appear on the stage of modern sports, the modern sports doping first use in the tradition endurance race of British. British Abraham Wood claimed that used opium to keep with sober for 24 hours, then beats the other players on endurance race in 1807[2]. Wood's experience is rapidly spreading, and takes incredible results. The tradition endurance race of British Championship results achieved 500 miles in 1877, the best results were up to 520 miles in 1878, which is equal to 840 km, and the Athlete is continuous running for138 hours. The effect of doping has been the rapid spread in the world sport, and then is used into the modern Olympic Games in 1896, doping always Contact with modern sports. Although other types of drugs banned were not have excitatory, such as diuretics, and even own inhibit, international still used the word dope Express the means the banned drug. Therefore, doping called is no longer drug that plays the role of exciting, but is actually referred to prohibited drugs and disable method in the sports.

Second, Doping overview

In different development period, the international sports organizations and Anti Doping Agency The definition of doping: the first definition about Doping is given by the International Olympic Committee (IOC) in 1963, which is "race athletes use any allograft material, behavior or by improper way to improve performance of the competition sports." This definition of doping is adopted on the international sports medicine international doping conference that in held in Tokyo in 1964. Doping concept given by The International Olympic Committee is “athletes using any form drug or non normal, abnormal and through ingestion of physiological substances, in an attempt to artificial and unfair way to improve their competition ability[3], that is considered the use of stimulants." before 1999. The World Anti Doping Convention and give the clearly defined about "doping" behavior, unified all the members

thought on the World Anti Doping Agency (WADA) convened In 1999 February. "Doping" includes two aspects meanings: one, any violation of the Olympic Anti Doping regulations, illicit drug use regulations specified or methods, should be as stimulant; another, no specific provisions in the regulation, but as long as the athletes use drugs or methods which cause potential damage to the self body health, at the same time, improve match grade, this should also be considered as doping. The definition of doping by Approved by the International Olympic Committee and the World Anti Doping Agency is: "the use the material and method which Cause potential hazards for the athlete's health, or can improve athletic performance. If found the material in the athlete body, there is evidence to use disable material in' Olympic Anti Doping Regulations list ', or there is evidence that use disable method in 'the Ordinance in the list'."

The 100 meter run overview

Firstly, `the 100 meter run development process

100 meters run is a sprint in track and field sports, is also one of the basic project, which Starting at Stadium in 776 BC. The100 meters race first appeared the games of Oxford University in the 1850, there were the project which 100 yards, 330 yards, 440 yards to run, at the end of the nineteenth Century 100 meters race's distance from yards into a metric. From the beginning of modern Olympic Games in 1896, the men's 100 meters race has been athletics events in the Olympic Games and World Championships in[4], as the Olympic Games and World Championships, which always from the purely physical event development to Athletics that Physical science and technology.

Second, 100 meters running motion characteristics

100 meters race is physical exercise, which base on the phosphate energy supply, periodic speed, power and technology. 100 meters race requires players to play to their maximum potential in the game, completes the whole race in the shortest time, it is a limit sports that distance is short, the speed is faster in the track and field sports. Now, the world elite sprinters has the results in 100 meters race is 10 seconds[5], the women's results is 11 seconds, phosphoric acid can provide energy about 6-8 seconds in this process. From characteristics of energy supply, energy supply and energy utilization are the main factor affecting in 100 meters race results.

TABLE 1 : The purpose on 100 meters race

purpose	Proportion
speed	29%
power	22%
technology	13%
doping	31%

The 100 meter world record evolution

Firstly, the men's 100 meter world record

The men's 100 meter race is A track fierce in the Olympic Games and World Championships. Since July 6, 1912, American Don Lippincott created the first accepted record in 100 meters (10.6 seconds) in the third session of the modern Olympic Games, (100 meters results have been using manual timing before the 1968 Mexico games[6], which Only accurate to 0.1 seconds, then accurate to 0.01 seconds. There produced a total of 19 World Records in history.

Canadian sprinter Ben Johnson has two world record which 9 seconds 83 in 1987 and 9 seconds 79 at Seoul Olympic Games in 1988. Tim Montgomery create world record that 9 second 78 in 2002, and Gatlin created world record that 9 second 76 in 2006. All is the reason for doping can't be recorded in annals. many facts to prove: since 21st Century 80 years, World Anti Doping efforts is strengthen and test ability is improve, many of famous athlete sets into disrepute for doping problem.

TABLE 2 : The men's 100 meter world record history

Grades	creator	nation	time	place
10 seconds 6	Donald, Kurt	America	1912.07.06	Stockholm
10 seconds 4	Charley Paddock	America	1921.04.23	Redlands
10 seconds 3	Take the west Williams	Canada	1930.08.09	Toronto
10 seconds 2	Jesse Owens	America	1936.06.20	Chicago
10 seconds 1	Wei Williams	America	1956.08.04	Berlin
10 seconds 0	Amin harry	Germany	1960.06.21	Zurich
9 seconds 95	Jim hayes	America	1968.10.14	Mexico City
9 seconds 93	Calvin Smith	America	1983.07.03	Colorado Springs
9 seconds 92	Carl Lewis	America	1988.09.24	Seoul
9 seconds 90	Le Roy, burrell	America	1991.06.14	New York
9 seconds 86	Carl Lewis	America	1991.08.25	Tokyo
9 seconds 85	Le Roy, burrell	America	1994.07.06	Lausanne
9 seconds 84	Donovan Bailey	Canada	1996 07.27	Atlanta
9 seconds 79	Maurice Greene	America	1999.06.16	Athens
9 seconds 77	Jehoshaphat Powell	Jamaica	2005.06.14	Athens
9 seconds 74	Jehoshaphat Powell	Jamaica	2007.09.09	Rieti
9 seconds 72	Usain Bolt	Jamaica	2008.05.31	New York
9 seconds 69	Usain Bolt	Jamaica	2008.08.16	Beijing
9 seconds 58	Usain Bolt	Jamaica	2009.08.17	Berlin

American athlete has been dominated In the 100 meters race. Since human entering in 21st Century, American athlete armed by high- technology to defend their ruling position. With the development of Internet technology, training and sports equipment and other cutting-edge scientific research achievement has already formed the sharing of resources[7], Jamaica who has a unique advantage of gene became leader of 100 meters race in the new century.

Second, the women's 100 meters world record

The world record that is admitted by IAAF is total of 21 in the women's 100 meter. In 20th Century 70-80, the Mann leader the Democratic Germany's Athlete has been dominated the women's 100 meter for 10 years. Until 1983 July, American Athlete Evelyn Ashford breaks the world record by 10 second 79, since then, the women's 100 meter race into the era of the United States. American Athlete Griffith Joyner create the record of10 second 49 in the Seoul Olympic Games in July 16, 1988,

women's 100 meter world record has been Americans holed. Today, high-technology is developing, although like Jones, White, Ody and other Athlete who Doping, also has no one can break the world record. Some evidence proves that Joyner may be Doping.

TABLE 3 : The women's 100 meters world record evolution course table

Grades	Creator	Nation	time	place
13 seconds 6	Marie Mejzlikovall	Czechoslovakia	1922.08.05	Prague
12 seconds 8	Marylines	England	1923.05.21	Paris
12 seconds 4	Lenisehmidt	Germany	1928.05.30	Leipzig
12 seconds 2	人見娟の枝	Japan	1928.05.20	Osaka
12 seconds 0	Tollien sehuurman	Netherlands	1930.08.31	Amsterdam
11 seconds 9	Tollien sehuurman	Netherlands	1932.06.05	Haarlem
11 seconds 8	Stanislawa Walasiewicz	Poland	1933.09.17	Pozran
11 seconds 7	Stanislawa Walasiewicz	Poland	1934.08.26	Warsaw
11 seconds 6	Helen Stephens	America	1935.06.08	Kansas City
11seconds 5	Fanny Blankers-Koen	Netherlands	1948.06.13	Amsterdam
11seconds 4	Marjorie	Australian	1952.10.04	Gifu City
11 seconds 3	Vera	the Soviet Union	1958.0913	Kiev
11 seconds 2	Wilma	America	1961.07.19	Stuttgart
11 seconds 1	Irena	Poland	1965.07.09	Prague
11 seconds 07	Wyomia	America	1968.10.15	Mexico City
10 seconds 9	Renate	Germany	1973.06.03	Ostrava
10 seconds 88	Malis Geer	Germany	1977.07.01	Dresden
10 seconds 81	Malis Geer	Germany	1982.07.09	Berlin
10 seconds 79	Evelyn Ashford	America	1983.07.03	The United States Air Force Academy
10 seconds 76	Evelyn Ashford	America	1984.08.22	Zurich
10 seconds 49	Griffith Joyner	America	1988.07.16	Indian

The Countermeasures of Anti doping abuse

Firstly, Detection means of doping

First, steroid hormones

The Samples of steroid are including urine, blood and hair. Most Samples need to detection of metabolites, because steroid is very complex in vivo process. All kinds of Method for analysis contain a chromatographic separation process. IOC has put GC/MS method that analysis of urine as standard analysis method to detect anabolic steroid in a certain period[8]. With development of LC/MS detection technology, LC/MS has the features of higher sensitivity and specificity, can adapt to detect all variety of new synthetic steroid, especially spectrometry liquid chromatography has been developed quickly. For example Donald Caitlin (DonH.Catlin) and his colleagues use LC/MS method and isotope ratio mass spectrometry successfully detect THG

Second, Growth hormones

Growth hormone is another class of doping in the 90's of the last century, which began to widely popular in the 100 meters race, because it belongs to biological macromolecules, traditional doping detection methods helpless to test it. Detection of GH faces two major difficulties. First, the body can Secretion Growth hormone, exogenous GH and endogenous GH have the same amino acid sequence, and it is difficult to use chemical or immunological identification. Secondly, this is not realistic that setting a GH blood standards, to measure unusual high GH,and indicate: hGH,. The level of body growth hormone in vivo produced can change a difference of 100 times by a number of factors, so to

distinguish between the use of dose from the body's normal levels is difficult. Based on the above reasons, the direct detection that: hGh in serum or urine is not realistic, so researchers will study the target steering to analyze the changes of hGH and GH subtypes which by some substance abuse in the blood.

There has developed two kinds of reliable detecting method: The first detection method is base on immunological, which can directly detect the changes of the ratio between the various subtypes of GH in blood, the principle is that natural GH there are several subtypes (molecular weight 17k, 20K, 22K etc.), secretion of GH subtype fixed proportion in blood pituitary, while the rhGH only contains a subtype then. If a player uses only contains only 22K hGH subtypes, ratio between 22K GH and total GH measured is higher than the normal value in blood. This method can detect hGH injection in 24 hours, suitable for race detection.

Another kind of detection method is to detect concentration of the sensitive material about GH in blood[9]. Through determining the concentration of these substances is more than the physiological limit to determine whether the Athlete use GH. These sensitive material about GH include two kinds, one is the GH/IGF axis, such as insulin like growth factor -I (IGF-I), insulin like growth factor binding protein (IGF-BPs), and acid labile subunit (ALS); another is index of bone and collagen turnover, such as bone alkaline phosphates (BS-ALP), phosphates I carboxyl propertied (PICP), phosphates III H-unfolded propertied (PIHP), I collagen terminal propertied (ICTP) etc. This kind of detection method after GH injected two weeks, it has reliable sensitivity, and it is not affected by the strenuous exercise, so can be used after the 100 meter race. Now, the use fluorescent immunoassay and radioimmunoassay method for the detection these indexes.

Second, Methods drug prevention

First, Modern chip technology

Gene chip technology has the features of high throughput, miniaturization, automation, low cost, anti pollution, Compared with the traditional instrument detection method in the doping test. The characteristics of gene doping makes traditional detection methods Invalid to test, such as physiology professor Lee Sweeney said, once muscle gene therapy was used as a new gene doping, the slogan of WADA 'PlayTure' will always be disappear, who has failures and defeats doping about the detection of WADA in recent years. However, gene chip technology can solve the problem that traditional methods can not detect the gene doping, and gene chip technology can improve the detection rate of the abuse gene doping. one word, gene chip technology is a detection technology that high throughput. Using this technique, researchers can simultaneously determine the expression profiles that thousands of genes, mutation spectrum and its mode of action. Researchers can get information in a few weeks, which are traditional methods for several years or even ten years to get. The Gene chip technology has the features of large-scale, high-throughput, high sensitivity, and high accuracy, which to make rapid and simple detection process, solved the problem that the complexity and low efficiency in previous research.

Second, the appropriate use nutritional supplements

The increasing muscle volume and muscle growth is closely related with 100 meter race result, which requires two conditions: environmental material protein synthesis and protein synthesis. Now, the popular sports nutrition supplements, high-quality protein of high biological activity and amino acid are the best raw material for the synthesis of protein, one is separation and preparation and their hydrolysis products including whey protein, casein, egg protein, soy protein and the protein (containing olio peptides and free amino acids), glutamine, orbiting and a- ketenes glutaric acid mixture (OKG), branched chain amino acid, p- light group, p- methyl butyrate (HMp) and taurine; anther is strong nutrition which to promote the body's own ketene, secretion of growth hormone, insulin and related

hormones, to create nutrients that is the best hormone environment for muscle synthesis, including argentine, ornithine, glycogen, glutamine, chromium, boron, vitamin C, zinc etc.

CONCLUSION

Through analysis the influence factors of exercise and physiology in 100 meters race, combined with doping events on the development of 100 meters world record, we can find the use of doping accelerated world record. The times of use doping in 100 meter race can be divided into four stages, the influence of the doping on the 100 meters in each stage, shows some doping on the 100 meter race is helpful to improve Speed. In recently, peptide doping and gene doping are overflowing, the doping has become the focus on future Anti Doping research, which is a very difficult task for Anti Doping work. Strengthen the drug monitoring efforts and punishment are only means, more effective measures and methods is strengthen the ideological education, the rational use of modern gene technology, and rational use of sports nutrition supplements, which purpose is in order to prevent drug harm the further spread.

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