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Review Article

The Finger Index «2d:4d» Of Female Athletes Who Are Engaged in Pancration and Wrestling Judo and Pancration

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Abstract

The article presents the results of a study devoted to the study of the values of the index "2D:4D" in 39 female athletes aged 18-20 years, engaged in pankration and judo wrestling. It was found that the largest representation of female athletes with finger proportions in the male type was in the group of girls engaged in judo wrestling (76%). It is shown that in sportswomen engaged in pankration the values of the finger index corresponding to the male type were met in 65% of cases. The conducted research showed that according to the index of the finger in various types of martial arts, they are dominated by athletes with genetically determined masculinization. Given the fact that the fingerprint index technique "2D:4D" is accessible and easy to use, it can be used as one of the informative criteria for the masculinization of the female body.

Keywords: athletes; masculinization; finger index «2D:4D"; pankration; judo wrestling

Introduction

For several decades, interest in the study of various aspects of women's sport, including the issues of masculinization in women in various types of martial arts, has not decreased. In the developing sport of pankration, as well as in other types of martial arts, female athletes are subjected to intensive physical and psychoemotional stresses that lead to adaptation of their organism with a tendency to morphological and psychological masculinization [1, 2, 3]. These changes concern the endocrine system and affect the reproductive function of female athletes, forming the phenomena of masculinization, with a concomitant decrease in the amount of adipose tissue and increase in muscle mass, disorders of the ovarian-menstrual cycle, formation of mesomorphic and andromorphic sex somatotypes.

Modern principles of selection of female athletes in originally male sports, which can be safely attributed to pankration, also involve the use of such an important diagnostic method as the definition of the finger index "2D:4D" according to J.T. Manning, i.e. the ratio of the length of the index (second) finger and ring finger (fourth) [4]. It was determined that the growth of the index finger is influenced by the "female" sex hormone estrogen, and that of the ring finger - by the "male" hormone testosterone.

It has been determined that the growth of the index finger is influenced by the "female" sex hormone estrogen, while the ring finger is influenced by the "male" hormone testosterone. One of the factors influencing this proportion can be considered intrauterine development of the female fetus in conditions of increased androgen content, which is characteristic of women engaged in sports before and during pregnancy [4, 5]. For women, the 2D:4D ratio is 0.99-1.1 [4].

Values below this standard indicate an increase in testosterone levels in the studied women, including female athletes. The use of this method in modern sports medicine and morphology provides an additional opportunity to identify female athletes with congenital signs of masculinization in the sports selection and training process [1-3, 5].

Hypothesis of the study

The hypothesis of this study is that female athletes with mesomorphic and andromorphic sex somatotypes, and values of finger index 2D:4D, male type, will have better sports results when practicing their sports - judo wrestling and pankration, which is due to the medical and biological restructuring of their body, under the influence of intense physical and psycho-emotional loads.

Aim of the work

The aim of this article is to present and analyze the research conducted to identify the changes in the values of finger index 2D:4D, in a group of female athletes, intensively and professionally engaged in such types of martial arts as pankration and judo wrestling.

Object, material and methods of research, and organization of the study

This study was conducted in "NSU named after P.F. Lesgaft, St. Petersburg" and on the basis of sports clubs "Pankration" and "Judo", in Novaya Kakhovka, in 2021-2022. It was attended by 23 athletes engaged in pankration and 16 - judo wrestling. Sports qualification: from 1st grade to Master of Sports; age: 18-20 years old. The control group consisted of 18 girls not engaged in sports. All female athletes who participated in the ongoing study gave their voluntary consent to the study. The study was conducted with strict adherence to all moral and ethical standards stipulated by the Helsinki Agreement. In this study, the finger index was calculated as the ratio of the length of the second and fourth fingers according to J.T. Manning [4]. Direct measurements were taken of the length of the 2nd and 4th fingers on both hands from the inner edge of the basal ridge at the base of the finger to the fingertip without pressure in each participant. Each finger was measured twice using an electronic caliper (accurate to 0.01 mm). It was considered if a "2D:4D" finger index less than 0.99 is a male hand type, and values between 0.99 and 1.1 are a female hand type.

Results of the study and discussion

As a result of the study of finger index in female athletes of both groups, the following results were obtained, which are presented in the table at $p<0.05$. Значения пальцевого индекса в исследуемых группах

Types of sport/uniform combat	X average value ± Sx	δ	CV %
Pankration (n=23)	0,981±0,007	0,05	4,9
Judo (n=16)	0,975±0,006	0,29	3,8
Control group (n=18)	0,995±0,004	0,036	3,5

Table 1: Values of finger index 2D:4D in the studied groups

In female athletes engaged in martial arts, as well as in girls in the control group, both male and female hand types are found. Equality of the length of the second and fourth fingers was also observed. At the same time, the average values of the index in female athletes were less than in the control group. The greatest representation of female athletes with finger proportions of the male type was found in the group of girls engaged in judo wrestling -76%. The dominance of female hand type and the same length of the studied fingers were more often stated in non-athletes.

In pankration women, the index values less than 0.99 were found in 65% of cases. The prevalence of women in sports with various signs of acquired and congenital masculinization is noted by many researchers [3, 5]. The multistage process of sports selection contributes to the concentration of female athletes with individual characteristics approaching male parameters in sports that require masculine traits, which gives these athletes a number of advantages in these sports.

Also, as a result of the study, we determined the index of sexual dimorphism, according to the method of J. Tanner`s, and the number of different somatotypes both in the two studied groups of female athletes and in the control group. Tanner's, and the number of different somatotypes, both in the two studied groups of female athletes and in the control group.

Types of sport/uniform combat	Gynecomorphic sexual somatotype	Mesomorphic sexual somatotype	Andromorphic sexual somatotype
Pankration (n=23)	7 (30,43%) female sportsmens	9 (39,13%) female sportsmens	7 (30,43%) female sportsmens
Judo (n=16)	5 (31,25%) female sportsmens	7 (43,75%) female sportsmens	4 (25,00%) female sportsmens
Control group (n=18)	16 (88,89%)	2 (11, 11%)	not identified

Table 2: The obtained data are reflected

In the studied groups of female athletes (n=39), 12 (30,77%) with gynecomorphic sexual somatotype were identified in total, and 11 (28,21%) athletes with transitional, non-physiological mesomorphic sexual somatotype and 11 (28,21%) with pathological for women andromorphic sexual somatotype. In all studied groups of female athletes, non-physiologic for women sex somatotypes were determined in 27 (69,23%) femalr athletes.

Conclusions

1. Thus, according to finger index indicators in different types of martial arts, female athletes with genetically determined masculinization prevail.
2. 2.The finger index, simple enough in application, can be used in the practice of sports activity as one of the informative criteria of masculinization of female organism.
3. Non-physiologic for women sex somatotypes were determined in 27 (69,23%) femalr athletes.
4. Despite the small number of examined female sportswomen, a significant number of them with non-physiological sex somatotypes and andromorphic indices of finger index - 2D:4D was revealed, which confirmed the hypothesis of the conducted study.

References

1. Bugaevsky KA. (2016). The study of the finger index and manifestations of sexual dimorphism in volleyball players, Actual scientific research in the modern world, 4:10(18):85-91.
2. Butovskaya ML, Burkova, V.N and Fedenok, Y.N. (2015). Finger index as an Indicator of Prenatal Androgenization and Its Relation to Morphological and Behavioral Traits in Humans, Ethnographic Review, 2:99-116.
3. Oleynik EA. (2009), The dactylar proportions of female athletes practicing Sports wrestling as an index of morphological Masculinization, Uchenye zapiski universiteta imeni P.F. Lesgafta, 54(8):83-86.
4. Chernyshova FA, Kiamova NI, Islamova NM. (2015), Finger index of athletes of different levels of sports training, V mire nauchnyh otkrytij. 7 (1):360-375.
5. Manning JT., (2002), The ratio of the 2-nd to 2-th digit length and performance in skiing, J. Sports. Med and Phys. Fitness, 42:4:446–450.

6. Paul SN, Kato BS, Hunkin JL, Vivekanandan, S. and Spector T.D. (2006), The Big Finger: the second to fourth digit ratio is a predictor of sporting ability in women, British Journal of Sports Medicine, 12:40: 981-983.

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