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Development of physical fitness – gender differences and characteristics

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Abstract

Physical activity, recreational sports as well as competitive sports effect the human body. Changes that occur under training are mainly connected to the adaptation process of body to specific form of activity. But on the other hand, changes that may be observed may lead to body functioning dysregulations that may affect health of sportsmen. Most of the changes are being observed mainly in the functioning of the female body system, despite the fact that they are not gender specific. In women, the undesirable effect of intensive training and heavy training loads may be inhibition of sexual maturation, withdrawal of the menstrual cycle and its irregularity, as well as resolution of the reproductive system function. That's why the understanding of gender specific changes are so important for the sportsmen and trainers to understand what may be observed during training and what it may lead to.

The aim of this work was to show the basic differences between gender physical fitness development observed during body development and physical training.

Keywords: physical fitness development, gender differences, physical training

Introduction

The positive relationship between physical activity and health is no longer debatable. People who undertake physical activity at a sufficient level obtain a wide set of benefits for physical and mental health compared to inactive people (Bouchard and co. 1990). However, it should be remembered that each time physical activity is associated with a number of changes observed in the functioning of the human body. The changes are healthy in most situations, however, in the situation of long-term physical training, the nature of induced adaptation may lead to the development of features not always characteristic of gender and leading to "blurring" of gender differences observed in the natural environment.

Sex dimorphism, which means the body's duality in form, manifesting itself in a series of changes in morphology, physiology, motor and human psyche, is also

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one of the criteria why women do not compete with men in sport. The size of the occurring changes is so large that the competition of both sexes in various sports would be devoid of a sporting spirit. In the ancient Olympic Games, only men who performed in scanty clothes in front of male audiences could compete. The law was against watching the show by women. Pierre de Coubertin also prevented rivalry between women as a "weak sex." The inconvenience was found in 1912, during the first official participation of women in the Olympic Games. Men, being naturally faster and stronger, wanted to compete with women as well as to become similar to the female sex. The problem of gender verification appeared in 1932 during the Olympic Games in Los Angeles (Mędraś 2010). However, the problem of gender diversity remains one of the basic criteria for sports qualification. Unfortunately, this phenomenon is still not fully understood by the players themselves as well as coaches and sport animators. Particular emphasis should be placed on deepening the knowledge of the impact of physical activity on the body shape of the competitors with particular attention to gender differences. Only understanding them consciously will allow you to conduct physical training, taking into account its possible consequences and methods of counteracting them.

Morphofunctional development

Morphofunctional development was based on the functions associated with the extension of the species, which are different in men and women. When a child is born, these differences are relatively small, which does not change the fact that they are clearly marked. During the course of the individual process, the features become apparent during puberty, and in the last period of people's lives - old age clearly fades away (Drozdowski 1997).

Characteristic features of the female sex stand out among others the specific nature of fat, greater stability and balance resulting from the lower center of gravity, changed body proportions. The morphological difference is evident primarily in the proportions of the body and its tissue composition, body weight and dimensions (Osiński 1996).

In literature and colloquial vocabulary two body types are mentioned: "typically male" and "typically female", which differ in their characteristics and proportions.

In the context of somatic features, larger body sizes can be considered as "typically masculine" than for women. It is characterized by a higher body height - on average about 8-10 cm, higher body weight - about 8 kg. Men are distinguished by a strong development of the shoulder girdle and chest, large head, massive neck, narrow pelvis, high muscle mass, low fat tissue located in the shoulder girdle area (Malinowski 1999; Malinowski and co. 2012).

Generally, the "female type" is dominated by lower height and weight, smaller head, long torso with a drawn waist, wide pelvis with significant fatness, and weaker muscle development (Malinowski 1999; Malinowski and co. 2012).

Another feature is the sex differences of the skeleton, which concern: a larger and more strongly built skeleton of men with a strongly marked cortical layer of long bones and larger bone bases. The male skull has a larger capacity than the female

(1500 cm³: 1300 cm³). In men we notice an obtuse cervical-molar angle, testifying to more frequent development of knee deformity (Malinowski 1999; Malinowski and co. 2012).

The discrepancy in the shape of the skeleton, as well as the structures of the joint - ligament apparatus translates into different functioning of the joints (women have looser joint capsules and ligaments), noticeable in women during motor activities related to running, throwing, stretching exercises. Statistically, women achieve greater mobility and joint flexibility than men (Fig. 1) (Malinowski 1999; Malinowski and co. 2012).

It is suggested that men and women differ in physical characteristics that can affect physical characteristics, physical fitness, and similarly to athletic performance. An example may be the somatotype, colloquially speaking, body type of women and men. Consistently occurs in the general and athletic populations, with women being more often endomorphic and men being mesomorphic (Carter and co. 1990).

Gender differences are seen as an inherent biological factor. During puberty, physical abilities develop more and faster in men than women. As a result, since puberty, men are better at motor tasks that require strength or speed (Knisel and co. 2009).

Biological factors may partly explain gender differences, other factors may also be involved. As it turned out, gender only matters in 5% of variance in physical abilities (Eagly 1995). Observing gender differences does not give us information about their origin, which can be natural, but also environmental. Which actually translates into the fact that in childhood boys more often participate in physical and motor activities than women (Wood and co. 2012; Hines 2004). In addition, there is evidence that gender has an important psychological impact on performance, i.e. boys are more motivated than girls to participate in rivalry and physical education classes, and have a higher perception of sporting competences (Biddle and co. 2011).

The effect of physical training on female body functioning

From the point of view of some researchers, suggestions have been made that physical activity and sports training may cause changes in the somatic structure of women (development of muscle mass, reduction of body fat) towards the male figure.

The organisms duality is not only visible in the specificity of morphological and physiological properties, it is also manifested in physical performance, leading to disproportion in the physical fitness of women and men. In general, men have greater strength, speed, endurance and agility. In contrast, women outperform men in terms of flexibility.

Physical activity, recreational sports and also competitive sports in the main group of elimination of disciplines that abound in strength and brutality (e.g. Boxing, MMA, American football). For competitive sports, a masculinized rather than delicate silhouette is desirable (Malinowski 1999; Malinowski and co. 2012).

In women, the undesirable effect of intensive training and heavy training loads may be inhibition of sexual maturation, withdrawal of the menstrual cycle and

its irregularity, as well as resolution of reproductive system function. This is the result of a great emphasis on maintaining a constant - low body weight, which they achieve through low calorific value, the use of diuretics, frequent use of the sauna and limitation of fluid supply. An extremely low body weight is associated with the critical body fat content, which is responsible for energy reserves and also acts as an endocrine gland - low energy balance contributes to gonadotropin disorders, low levels of estradiol, progesterone, T3, T4, insulin. Whereas men encounter disorders from the hypothalamic axis - pituitary gland - male gonads, i.e. lower levels of testosterone, LH, cortisol, and prolactin (Malinowski 1999; Malinowski and co. 2012; Mędraś 2010).

Several authors have suggested that for morphological and physiological reasons men will dominate in sports that are based on anaerobic strength and endurance, while women were far better able to cope with aerobic exercise over longer distances (Beneke and co. 2005). Previous studies of sexual dimorphism in world records do not support this statement.

Coast and co. (2004) compared the results of men and women over a distance of 100 m and 200 m found that the difference between the sexes increases with the distance covered, not decreases. However, the interpretation of these results may be disturbed by the fact that there are a proportionally insufficient number of women in the study (Coast and co. 2004).

Summary

Analyzing the impact of physical training on the human body we can observe that training dysregulates and affects the functioning of almost all systems of the human body. This leads to the development of a number of adaptive changes, but on the other hand it disrupts the body's natural homeostasis. The relatively large number of observed changes have a short-term nature (especially hormonal disorders), however, it should be remembered that the rate of recovery may be very extended in time, and sometimes even impossible.

Understanding inter-gender variability is and will be the basic qualification criterion in sport and will invariably be an important element of "competitive sport" which will be an inevitable element of its implementation.

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