SPRINTS BIOSOMATOLOGIA

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Abstract

Biosomatologia studying the morpho-characters of human body. Following knowledge of the effects of practicing sport on the human body, structural changes, biochemical and functional at the cellular, tissue, organic and systematically manifested by changing body shape and acquiring skills driving outstanding biosomatologia has a number of objectives relevant to sport performance.

Keywords: sport, biosomatologia, biotype, sporty performance

JEL classification: I12, I120

Introduction

As I mentioned in the preamble of this work, biosomatologia's objectives are the following:
- knowledge of morphological and functional indices optimal somatic characteristics of each biotype sports events;
- knowledge of the laws of growth;
- knowing all the factors that contribute to somatic biotype;
- knowledge of changes in body structure under the influence of different types of effort;
- establish an appropriate methodology for determining the degree of knowledge and physical development and biometric qualities in relation to sex, age and the sport;
- orientation by sport which contributes to better development in that sport could achieve maximum efficiency;
- pursue the indices under the influence biosomatic training and guidance biotype somatic individualization means to achieve the requisite sport at the current level;
- detecting and indicating means corrective physical deficiencies;
- pursuing efficiency exercise as therapeutic factor, with different actions.

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Problematic

By content, biosomatologia linking sport and theoretical and laboratory disciplines as genetics, anatomy, edocrinology, auxological, biomechanics, biochemistry, histology, nutrition, functional explorations, radiology, etc.

Description body favored athletes with performance is very old, from Flavius Younger, who in the third century C.E., participants describe the morphology of the Olympics, differentiated sports events.

The content of the concept of "human body" has changed with the evolution of knowledge to those who have studied the human body from anatomically descriptive character in sec. XVIII, the functional aspects in sec. XIX.

Simultaneously with entering cybernetics in all areas, the human body is considered a bio, a number of factors, which are in a single complex interactions that gives specific system behaves as a whole, properties and functions own distinct qualitative properties elements. All cybernetics allows knowledge, routing and prognostication of the functional capacity of the body.

In Romania, the study of morphological traits in athletes was made by almost everyone who contributed to the development of sports medicine: Fl. Ulmeanu conducted research on the constitution athletes and concludes that, in these "constitution is promoted or inhibited by certain characters compose exercise practiced by nature "; R. Lungu, imagines investigational devices - adipocentimeter, anthropometric framework, dynamometer plantograph, etc.

There are, however, authors who deny the existence of morphological differences between athletes and body structure unsportsmanlike (Prohop, Lange, etc.). However, differentiated appearance in different proportions and form copra sports events linked to effort character is evident from the simple somatoscopic exam, today being the first means of selection of the coach. This corresponds to a known biological laws, which highlights the correlation between functional and morphological characters, then "function creates the organ" (Fl. Ulmeanu). It follows that the request predominant certain functions corresponding to the requirements of a particular kind of stress causes morphological changes characteristic to sports events.

The methods used in biosomatologia are: anthropometry, somatoscopic, densimeters directly or indirectly, determining strength, speed, endurance, and coordination of specific simulators effort specific to various sports events, sex determination, determinations biochemical, radiological, biomechanical, genetic.

Anthropometry is the method of objective assessment of the development of stature, nutritional status, the proportions of development of the various segments. Measurements that can be made are numerous and vary according to the authors, conditions or purpose. Importantly, anthropometric measurements should be taken after a single system so that values can be compared with each other.
In this regard, I present a system of registration and interpretation used by the Center for Sports Medicine in Bucharest:

Athletes' stature values are between very wide limits, from very small to exceptionally high, which is why using a special scale (averaged over 50,000 athletes), with extremely broad. (see Table 1).

**Table 1. The stature of athletes**

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>X±</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very small stature</td>
<td>150,5-157,4</td>
<td>140,5-147,4</td>
</tr>
<tr>
<td>Short stature</td>
<td>157,5-164,4</td>
<td>147,5-154,4</td>
</tr>
<tr>
<td>Medium height</td>
<td>164,5-178,4</td>
<td>154,5-168,4</td>
</tr>
<tr>
<td>Great stature</td>
<td>178,5-185,4</td>
<td>168,5-174,4</td>
</tr>
<tr>
<td>Great stature</td>
<td>185,5-192,4</td>
<td>174,5-181,4</td>
</tr>
</tbody>
</table>

*(Center for Sports Medicine in Bucharest)*

Average values range, comprising 68% of athletes; the high and low range, comprising 27% and of the very small and very large further 4%. Beyond these values, lies the exceptional on the radar endocrinologist.

**Nutritional status.** Health and how food intake corresponds to energy costs, reflecting the nutritional status.

Variations in body weight are physiological processes in relation to the growth and development of the athlete: 6-7 years there is a spurt in prepubertal girls period, can vary between 9-15 years, and later in boys, may oscillate between 11 to 17 years. Therefore, between 9-13 years, the growth rate is higher in girls and less boys.

Nutritional status is assessed by dividing body weight in stature, in the appropriate age and gender group.

In sport, knowledge of body composition, which varies by constitutional biotype characteristic of various sports events, has a special significance. Brozek and Keys took into account the variation in body weight by changing the proportion between fat (reserve energy body) and mass processing (reserve energy body) and weight active (body weight minus fat, which should be constant).

It is believed that the optimal active mass to be 89% by weight, and fat 11%. The active mass is made up of water, 73% protein, 20.2% and 6.8% minerals.

At the Center for Sports Medicine, the proportion of fat is calculated indirectly by measuring the folds of fat (using an instrument that will catch the fold formed by splitting the subcutaneous tissue under the muscle layer underlying and close more complete both parts of subcutaneous ply method for removing deficiency):

\[
\text{Fat\% of body weight} = \left( \frac{\text{sum of five subcutaneous fat envelopes} + \text{BSA}}{\text{X} \times 0.15 + 5.8} \right)
\]
Calculation of proportion of body fat based on the densitometry principle by underwater weighing, gives more precise values to the indirect method by erroneous values that can occur to measure folds of fat.

The optimum is 11-12% fat. The evidence that excess weight disadvantage performance (jumping in athletics, gymnastics), it may be reduced to 9%. Note that reducing fat in the lower limit is met and evidence of resistance (5000 and 10.000m in athletics, marathon), demonstrating that these resources are sufficient to carry sports lengthy effort. The reduction of body fat occurs at the lower limit and evidence weight category. Thus, the active mass increases parallel force to assessing performance. If the active mass is increased by anabolic (in massive doses) with large water retention, it is found that the force does not increase parallel with active mass.

The proportion of fat can increase the normal limits up to 15% of body weight, in some samples, it is not to the detriment of active mass (fencing, shooting). Larger increases are observed in pitchers and heavyweight, wrestling, weightlifting. In these cases, however, it is important to grow while the active mass.

In sports, body composition should be consistent with the character effort. In evidence to the static (shooting, chess), it is recommended that athletes are normal weight and have the appropriate active mass. But there are cases where athletes, although they are normal weight, have higher rates of fat, often accompanied by an increase in blood lipids (shooting). If excess fat is an active table while normal performance is not disadvantaged.

In speed tests, benefit those with lower limb and torso muscle hypertrophy less difficult. The thorax is usually narrow, with less developed muscles. It is favored athlete with a 91% active mass therefore the lower limit fat (9%).

On the evidence of force, weight lifter (82.5 kg category), for example, the same height as a sprinter, will present a hypertrophy of up to 20 kg lean mass.

Samples throw, aiming to gain weight, it appears that sometimes may be less developed muscles.

It must not lose sight that a massive hypertrophy as weightlifting, is accompanied by the increase of water in the active mass and adipose tissue. In this case, the proportion of protein and minerals is from 19.82 to 14.62 to the thrower and weightlifter same weight. Instead, the pitcher a percent body fat physiologically, a large active mass and a very high proportion of protein and minerals.

Body proportions

Knowing the proportions of a sports segmentation is necessary to know to what extent existing characters inducing performance. We need to know which of these proportions are stable, being predominantly hereditary character, making it
very difficult to change. These features serve as landmarks in the selection of athletes; if qualified athletes must know to what extent the proportions are unfavorable to obtain performance and are the means by which can be obtained.

Study proportions by measurements made "live" using skeletal parts, applying functional anatomy and biomechanical data and knowledge specific optimal values for each branch of sport is the only way knowledge of the purpose of assessment of the athlete's physical development.

The study is based on comparing the proportions of individual segments with body height or size of the segments together. Most often it is used and the ratio of waist segments:

\[
\text{(Measure chosen x 100) / stature}
\]

**Sports biotype**

The most important studies of the physical athletes, it starts to search the correlation between morphology and performance of the individual.

**Biotype** is a model developed by the aggregation of a number of nature, abstraction, serving as a reference picture on individual cases. He can be built based on an ideal image of normal, based on objective data obtained by measurements and statistical processing. W.H. Sheldon describes three types of biotype: endomorph, ectomorph and mesomorphous. Others, distinguish four morphological types: dolimorphous, mesomorphous, brahimorphous and mixed.

In practice it is found that each sample is favored by some sporty proportions and specific exercise leaves turn a certain fingerprint, being a biotype characteristic of each branch of sport.

To determine whether biotype somatic meet the requirements that test and to make a classification in the selection can be achieved calibration by drawing a curve on a graph in which a coordinated arrives average value indices anthropometric most features to sample, and the other variations ±.

The procedure was as follows: comparing the sample value in the respective index. It makes the difference and divide by variation, all indications totaled minus score. The result is the rating athlete.

The method is useful in the selection of a large number of sports.

Another system consists in calculating the percentage change compared to the best values, the most important indicator of the sample.

Since variance values can present great fluctuations from one index to another anthropometric method is much more accurate percentage changes, highlighting the relationship between anthropometric index and performance.

In other news, it is unfair to AFIM that sport in general is correct. For example, swimming crawl make kyphosis; back stroke, corrects them.

Practice sporting events, asymmetrical movements, may trigger kyphosis and scoliosis. Jumping into water, athletics, gymnastics are against all deviations spine with trend rotation or structural changes accompanied by pain. Boxing, by its
fundamental position makes a kyphosis curvature moderate to widen with time hypertrophy, bringing the shoulders forward and pectoral muscles shorten. Rowing, practiced asymmetric leads to asymmetric hypertrophy of the muscles of the shoulder girdle and back and, when they occur on a structural column disorders appear painful scoliosis. At present canoe muscle hypertrophy asymmetric lower limbs and scoliosis formation of the "S" right dorsal, lumbar left. Fencing, by requiring asymmetrical muscle, leading to hypertrophy asymmetrical arms and legs 2-3 cm and the appearance of scoliosis. If paravertebral musculature is well developed, they are well tolerated.

The same issues may occur in hammer throwers or disc, where hypertrophy is very strong, with a high voltage asymmetric traction on the vertebral bodies, being more twisted column. Isometric effort lengthy filed attitude scoliosis leads to the gradual formation of scoliosis by asymmetric pressure on the vertebral bodies. Physical training with corrective exercises should be part and parcel of athlete preparation.

**Conclusion**

Motor activities develop musculoskeletal, engaging in activity respiration, circulation, exchange nutrient regeneration processes, regulating neuroendocrine systems, perfecting the functional structure of tissues, stimulating growth and development and, thus, a better integration of elements which make up the body.

Thus, knowledge of growth and harmonious development of the younger generation, phased age, causes that can influence these processes leading to the emergence and installing physical deficiencies global or segmental as well as research methodology them, was and is one of the chief concerns of specialists in social and human sciences.

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