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## **Main directions of improvement of high-class sportsmen training system**

### **Główne kierunki współczesnego systemu przygotowania sportowców wysokiej klasy**

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## Streszczenie

**Cel pracy i metoda.** Celem badań była analiza przygotowania sportowców klasy międzynarodowej do wielkich międzynarodowych zawodów sportowych w oparciu o przegląd literatury i dokumentów. **Wyniki i wnioski.** Dopuszcza się stwierdzić, że jednym z najbardziej istotnych czynników jest podnoszenie efektywności szkoleń poprzez właściwe odżywianie, profilaktykę antyurazową, dostosowanie organizmu zawodnika do warunków klimatycznych i geograficznych, jakie zastanie on w miejscu zawodów. W sporcie, na przestrzeni ostatnich stu lat, można zauważyć, że proces przygotowania olimpijskiego ewoluował od przygotowań spontanicznych do standaryzacji i indywidualizacji treningu. Proces standaryzacji i indywidualizacji treningów zapoczątkowali trenerzy i zawodnicy z byłej Niemieckiej Republiki Demokratycznej. Od tego momentu widać, że w ciągu ostatnich 20-25 lat naukowe podstawy indywidualnego przygotowania sportowców uwzględniają m. in. podział na płeć, predyspozycje psychiczne i fizyczne a także inne istotne czynniki.

## Abstract

**Aims and objectives and methods.** The aim of this researches was to know analysis was based mainly on literature and documents review which characterize the preparing and competition activity of the great number of international class sportsmen and many-years observation of sport practice. **Results and conclusions.** It allowed to claim that one of the most essential way is the raising of efficiency of non-training and non-professional factors. Actually all kinds of the sportsmen training system providing, nourishment, traumatism prophylaxis, the regarding of climate-geographic conditions of the main competitions and other non-training factors have not only important, but principal significance.

More detailed and scientifically elaborated individualization of high-class sportsmen is also of great importance. Estimating the experience of above 100 years history of modern Olympic sports it can be noticed that in the first 80-90 years the sportsmen preparing process evolved from spontaneous individualization to definite standardization. The evident examples are the sportsmen training programmers of the former German Democratic Republic. Together with this in the last 20-25 years the visible raise of scientifically elaborated individualization of sportsmen preparation can be noticed, with the consideration of their sex, specialization psychological and physical abilities and other factors.

## **Introduction**

The further development of record-holder sports greatly depends on precisely estimated priorities of improvement of high-class sportsmen training system. Evidently it demands the serious analysis of the modern training system (Ozimek 2007). The carried out analysis was based mainly on literature and documents review which characterize the preparing and competition activity of the great number of international class sportsmen and many-years observation of sport practice. It allowed to claim that one of the most essential way is the raising of efficiency of non-training and non-professional factors. Actually all kinds of the sportsmen training system providing, nourishment, traumatism prophylaxis, the regarding of climate-geographic conditions of the main competitions and other non-training factors have not only important, but principal significance (Williams 1992, Bartoszewski 2000, Karter – Erdman 2000, Celejowa 2001, Płatonow 2004, Ozimek 2007).

Among the main priorities in present and future is the raising of the efficiency of medico-biological providing of sportsmen preparation processes. It assumes the organization of proper processes by medical advisers with competent, current and permanent control, detailed medical investigation of sportsmen, the injuries diagnostics, prophylaxis and treatment as well as the proper nourishment and pharmacology assurance (Gabryś and Kosmol 2000, Karter – Erdman 2000, Słowińska–Lisowska and Sobiech 2000, Celejowa 2001, Sedlacek and Cihova 2009, Ljach i Witkowski 2011, Zemkova 2011).

The modern high-class sportsmen preparation assumes also the efficient scientific-methodical providing. To-day the high-class sportsmen preparation without scientific support, permanent trainers, medical advisers, scientists and sportsmen cooperation can not be imagined. Sportsmen now are becoming the full- rights members of the preparing team (Naglak 1999, Sozański 1999, Gabryś and Kosmol 2000, Carr 2004, Bompa and Carrera 2005, Zając i Waśkiewicz 2007, Bompa and Haff 2010, Ljach i Witkowski 2011, Kampmiller et. al. 2012).

Together with the raising of scientific-methodical significance during the last period the importance of scientific achievements introduction into the high-class sportsmen preparing processes also raised (Carr 2004, Bompa and Carrera 2005, Zając i Waśkiewicz 2007, Bompa and Haff 2010, Zatoń and Jastrzębska 2010, Ljach i Witkowski 2011, Kampmiller et. al. 2012).

More detailed and scientifically elaborated individualization of high-class sportsmen is also of great importance. Estimating the experience of above 100 years history of modern Olympic sports it can be noticed that in the first 80-90 years the sportsmen preparing process

evolved from spontaneous individualization to definite standardization. The evident examples are the sportsmen training programmers of the former German Democratic Republic. Together with this in the last 15-20 years the visible raise of scientifically elaborated individualization of sportsmen preparation can be noticed, with the consideration of their sex, specialization psychical and physical abilities and other factors (Gabryś and Kosmol 2000, Carr 2004, Bompa and Carrera 2005, Neumann et. al. 2006, Zając i Waśkiewicz 2007, Miller 2008, Bompa and Haff 2010, Ljach and Witkowski 2011, Łuszczynska 2011, Kampmiller et. al. 2012, Kasa et. al. 2012).

## **Methods**

Corresponding analysis carried out by us based, first of all, on literature and documents study which characterize preparatory and competitive activities of great number of international-class sportsmen and long-term observation of sport practice, allowed to state that one of the main features of modern high-class sportsmen training system is the complexity. The complexity is still increasing and appears, for example, in great amount of factors which radically influence training efficiency and corresponding achievements of sportsmen.

## **Results**

Nowadays all kinds of sportsmen training system provision, nourishment, traumatism prophylaxis, consideration of climatic and geographic conditions of the main competitions and other non-training factors have principal significance. Simultaneously, the increasing of every mistake value is observed during the process of sportsmen preparation with laying particular stress on importance of victory and competition in great sport events. There are a lot of examples that concern all factors of sportsmen preparation system. During the period of last years the most characteristic and dangerous mistakes are connected with medico-biological provision of sportsmen that assumes permanent realization of correspondent process by medical advisers with operative, current and stage control with deep medical examination, diagnostics, traumas prophylaxis and treatment as well as appropriate nourishment and pharmacological provision. Especially fast the significance of rational nourishment of sportsmen increases.

A quarter of a century ago the suitable knowledge were limited to the provision of appropriate proteins, lipids and hydrocarbons assortment, vitamins' and microelements' quantity, usage of liquids and, naturally, energetic value considering the increased energy

output by sportsmen under evident importance of high quality and necessity of products. Now against a background of all these factors keeping the nourishment of sportsmen changed into independent and complex sphere of knowledge (Williams 1992, Karter – Erdman 2000, Słowińska–Lisowska and Sobiech 2000, Celejowa 2001). Among different aspects it can be distinguished: nourishment in different kinds of sport; nourishment of young and adult sportsmen; nourishment of men and women; nourishment before competitions and between the starts within competitions; nourishment with consideration of national and religious traditions, individual habits and prepossessions against definite products, of functional preparation level and psychical condition, of weather and season, of long-distance flights and many other factors. Rational individual nourishment is very important factor and component of modern sportsmen training process.

Together with the increasing of rational nourishment significance the importance of efficient pharmacological provision also increases last years. At the same time pharmacology now is treated as separate significant factor in sportsmen training system (Bartoszewski 2000, Płatonow 2004, Gieremek and Dec 2007). There is a group of sportsmen and trainers who consider pharmacology to be the main factor of success. Actually without usage of allowed pharmacological agents it is difficult for sportsmen to manage the great loads and stresses in modern sport. However in order to use pharmacology in sport in appropriate way high qualification of sport medical advisers is demanded; they must perfectly know what kind of medicine may be used by sportsmen. Pharmacological agents must be chosen individually taking into account the sportsmen preparing period, because something suitable for one competitor not always good for another one. It can also happen that suitable at the actual moment medicine may become hazardous for sportsman in a month. It is worth emphasising that the mistakes in medicine usage have very high cost.

Together with the increasing of importance of medico-biological provision of high-class sportsmen training system the importance of scientific and methodological provision also increases. Nowadays it is impossible to imagine the process of preparing of high-class sportsmen without of scientific assistance, permanent co-operation of trainers, medical advisers, scientists and sportsmen, of course, that become full- rights members of the preparing team. Simultaneous with increasing of scientific and medical provision importance in training system of high-class sportsmen the significance of introduction of scientific and technical achievements into this training process also rises and especially it will be actual in future. Today the equipment, diagnostic apparatus, training outfit, prophylactic and treatment medicine also influence sport results not less than other elements of training system.

Next direction of high-class sportsmen training system improvement is scientifically founded individualisation. Analysing the above 100-years history of modern Olympic sport, beginning from the first Olympic Games in Athens it can be noticed that during first 80-90 years up to 70<sup>th</sup> of XX century the system of sportsmen training evaluated from spontaneous individualisation to definite standardisation. The most spectacular example are training programmes of former GDR sportsmen. Together with this during last 20-25 years evident rise of scientifically elaborated individualisation of training system with consideration of sex, specialisation, psychic abilities and other factors can be observed. Probably this tendency will not be continued.

Next important direction of high-class sportsmen training system improvement is connected with current consideration of changes in general strategy of many-years training. Definite changes in general strategy of many-years high-class sportsmen training system are reflected by the increase of the age when sportsmen achieve the highest level of mastery and by keeping this level for a long time. It is confirmed, for example, by track and field athletics data - sport discipline which is characterized by the greatest number of Olympic medals (fig.1).

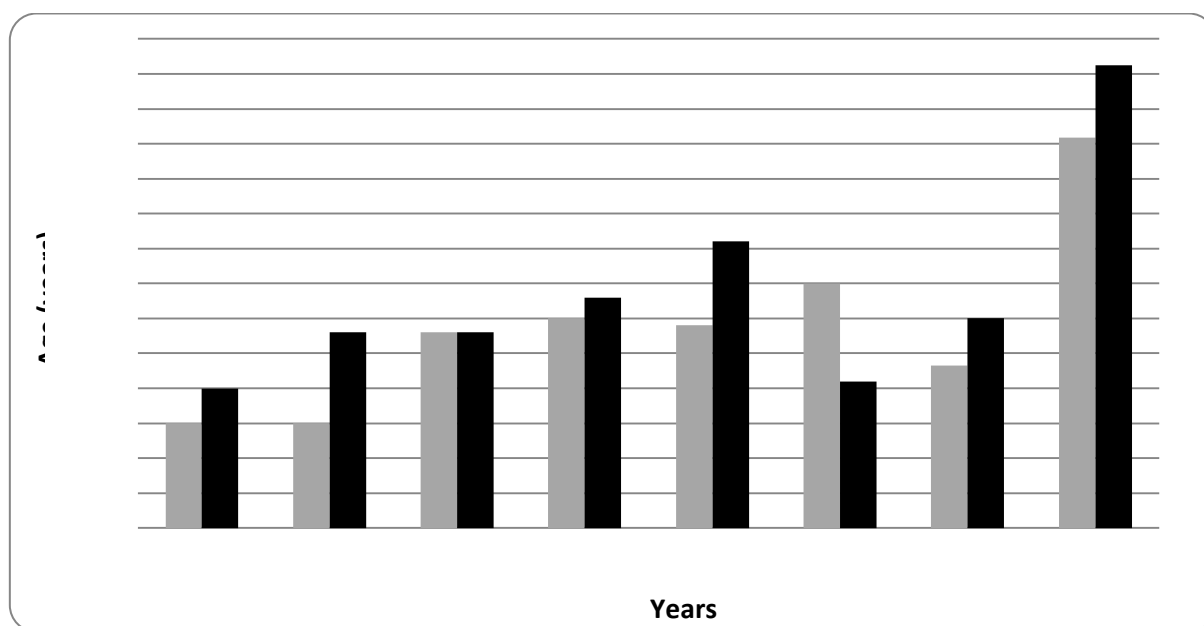


Figure1. Dynamic of average age changes of athletes-Olympic medalists: women (■) and men (■)

Besides these spectacle examples, it is necessary to notice that after significant increase of the age of best achievements and longevity of corresponding mastery level keeping, nowadays the tendency of this age stabilization and longevity of mastery keeping is

observed (fig. 2, 3, 4). It can be explained by impossibility of further Olympic sport commercialization influence on above mentioned sport indexes, which is one of the main significant factor in many-years strategy of sportsmen training system.

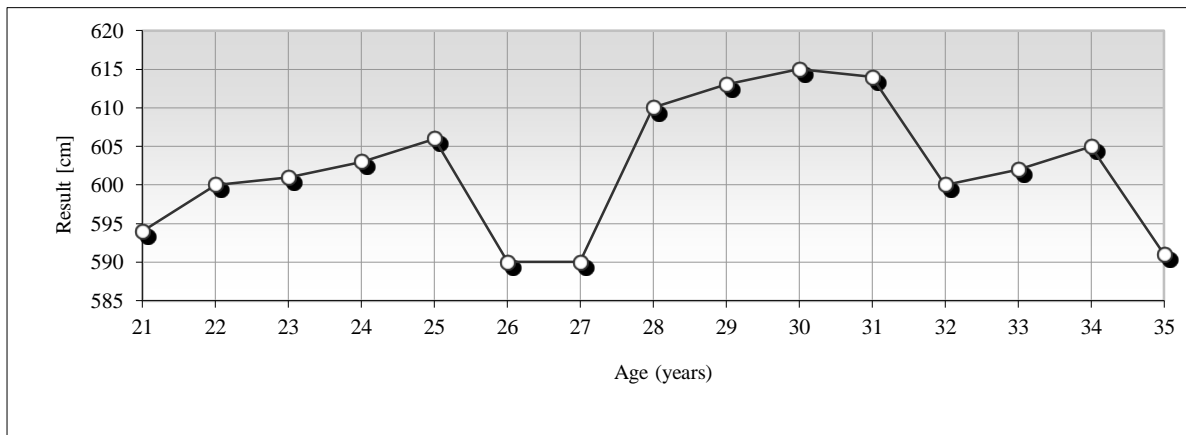


Figure 2. Results Olympic champion from 1988, the multiple world champion in the pole vault S.B. (the time in the team 25 the best in the world - year-old rankings)

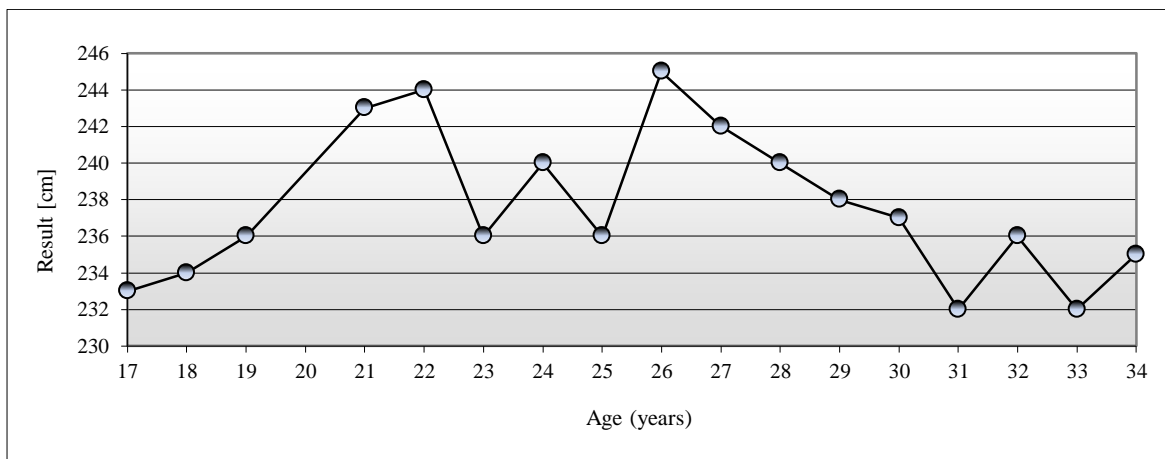


Figure 3. Results Olympic champion from 1992 in the high jump J.S. (the time in the team 25 the best in the world - year-old rankings)

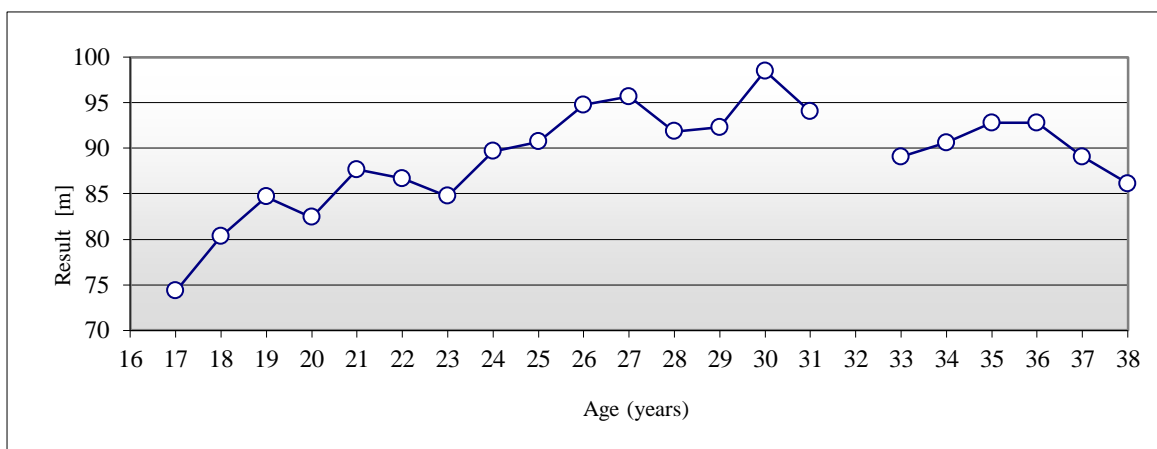


Figure 4. Results Olympic champion from 1996, 2000 in the javelin J.Ž. (the time in the team 25 the best in the world - year-old rankings)

Next key change is connected with the improvement of the system of annual sportsmen training.

Characteristic feature of modern high-class sportsmen training system is complex and sufficiently changed during last 15-20 years structure of annual cycle of training. Such changes, first of all, is the result of commercialization and professionalism of Olympic sports that supposes the participation of best sportsmen in competitions during the whole year, and also in commercial competitions. In such conditions difficult task appears – to reach a compromise between the necessity of best results achievement at the main competitions of the year and natural desire of frequent and successful participation in competitions. It demands the planning and realization of individually chosen multi-cycle system of sportsmen training during the year.

## Conclusions

Concluding this short analysis of chosen directions of high-class sportsmen training system improvement, it can be assumed that in nearest years radical changes in training system are practically unreal. Progress in this branch is greatly connected with realization of complex improvement of wide range of non-training factors impacting the efficiency of training system.

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