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Relations between basic anthropometric indexes and selected elements of maintain balance abilities in high level fencers

Włodzimierz Starosta[1], Gennadij Markiewicz[2], Tatiana Pawłowa-Starosta[3]

[1] International Association of Sport Kinetics. University School of Physical Education and Tourism in Białystok, Poland
[2] State University in Grodno, Belarus
[3] Institute of Sport in Warsaw, Poland

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Summary

Introduction. The aim of the work was to: 1. Define the relation between the basic antropometric indexes and the age, training period, sport class and specialisation of the fencers. 2. Search relations between the basic antropometric indexes and the selected abilities to maintain balance.

Material and methods. There were 87 fencers taking part in the researches. Those investigated belonged to the youth up to the (masters) champion sport class, and were in the starting training period. In order to conduct balance measurements a device composed of a posturographic platform connected to a computer with a monitor — registering the translocation of the body's centre of gravity, was applied. The examination was composed of three test tasks: 1. The ability to maintain the stable body position with an eyesight control. 2. Assessed the behaviour of this centre with the eyes closed. 3. Applied feedback on the basis of which the examined tried to maintain a light spot in a small square displayed on the monitor through the adequate *„platform adjustment".*

Results. Significant relations were observed between: the height and the body mass (0.67); the age and the training period (0.67); the performance of the task with opened and closed eyes; the performance of the task with open eyes (0.68); the performance of the task with open eyes (DC) and closed eyes (PPR): 0.43; performance of the task with open eyes (DC and PPR): 0.67; execution of the task with open eyes (DC) and closed eyes (PPR): 0.71.

Conclusions. High correlation coefficients occurred, however, between the results of the particular tasks evaluating the abilities to maintain balance defined through coefficients of total length and the area of the extended surface. No statistically significant correlation between the basic anthropometric indexes and selected elements of abilities to maintain balance was ascertained.

Introduction

Achieving success in fencing requires a high level of movement coordination. The discipline ranks among the third level of co-ordination [1-5] since it requires the performance of precise and speed movements in the fast changing conditions. The leading coordination ability in this discipline of sport is the speed reaction of adequate response to the actions of the opponent connected with their anticipation. The ability to maintain balance has a nearly equal importance among all those components affecting the success of those practising fencing. In the researches so far, much attention has been devoted to the speed of the reaction, but very little to the ability to maintain balance [6]. Hence, the aim of the work was to: 1. Define the relation between the basic antropometric indexes and the age, training period, sport class and specialisation of the fencers. 2. Search relations between the basic antropometric indexes and the selected abilities to maintain balance. 3. Establish mutual interdependencies between the selected elements of balance maintaining abilities.

Material and methods

There were 87 people taking part in the researches (29 female competitors and 58 male competitors) aged 15-20 (x= 17.4 for women and men). The competing period oscillated within the range of 6.5-8 years. Those investigated belonged to the youth up to the champion sport class, and were in the starting training period. In order to conduct balance measurements a device composed of a posturographic platform connected to a computer with a monitor — registering the translocation of the body's centre of gravity, was applied [7-14]. The examination as composed of three test tasks. The first one checked the ability to maintain the stable body position (stabilisation of the centre of gravity) with an eyesight control. The second assessed the behaviour of this centre with the eyes

closed. The third, applied feedback on the basis of which the examined tried to maintain a light spot in a small square displayed on the monitor through the adequate *„platform adjustment".* Each of the test tasks lasted for 32s. After each of the measurements the examined person was asked questions regarding the quality of the performed test task. Hence, a self-evaluation was demanded.

Results and Discussion

At first, relations concerning the results of all the investigated were analyzed (Table1). Significant relations were observed between: the height and the body mass (0.67, P< 0.001); the age and the training period (0.67); the performance of the task with opened and closed eyes (the area of the extended surface, PPR — 0.30); the performance of the task with open eyes (total length — DC 0.68); the performance of the task with open eyes (DC) and closed eyes (PPR) — 0.43; performance of the task with open eyes (DC and PPR) — 0.67; execution of the task with open eyes (DC) and closed eyes (PPR) — 0.71; The performance of the task with a feedback (DC) and open eyes (PPR) — 0.87.

Further on, correlation between the basic anthropometric indexes and the age, training experience, sport class, and the specialisation of those investigated were searched for (Table 2). Significant correlation appeared between age and the body mass (in the range of 0.29 – 0.57), and the training experience (0.44 – 0.86). A very high correlation was featured by the height and the body mass (0.,43 – 0.67). A slightly lower relation referred to the body mass and the training experience (0.36-0.62). Almost no relations were observed between the sport class and the age, height and body mass, and sport training experience.

At last, relations between the selected elements of the ability to maintain balance were sought (Table 3). The ability was evaluated following the application of 6 testing tasks (three concerning the area of the extended surface, and three concerning the total length). A very high correlation occurred between these two groups of testing tasks (0.53 –0.96). It proved that, when analyzing the results of one of the groups we obtain full information on the level of the ability to maintain balance of those investigated. A relatively high correlation was observed between the results of the tasks performed with open and closed eyes (0.45 – 0.79). Almost no relations were observed between the task with a feedback and the remaining tasks. It may prove that with its aid, separate elements of abilities to maintain balance are being assessed.

Table. 1. Correlation indicators antropological and selected elements ability to do maintence stability to practise in a fencing (n=87)

Age	Body height	Body weight [kg]	Training	Field of force fully developed				Length quite		
				Class sport	Open eyes	Closed eyes	To tense returnable	Open eyes	Closed eyes	To tense returnable
0	1	2	3	4	5	6	7	8	9	10
1	0.19	0.29*	0.62***	-0.10	-0.01	0.12	0.05	0.01	0.19	0.04
2		0.67***	0.09	-0.12	0.01	0.27*	-0.23	0.07	0.27*	-0.20
3			0.21	0.00	0.19	0.15	-0.17	0.18	0.21	-0.11
4				-0.18	-0.13	-0.03	0.09	-0.07	-0.01	-0.01
5					0.14	0.09	-0.07	-0.02	-0.02	-0.02
6						0.30**	-0.07	0.68**	047***	0.04
7							0.19	0.43**	0.67***	0.17
8								0.11	0.08	0.87***
9										0.21
10										0.17

Table 2. Correlation antropological indicators and age, experience, sport class by women and men in the practising different kind of fencing (n=87)

Lp.	Sport specialization (kind of fencing and sex of investigated persons)	N	Indicators										
			Age				Body height			Body weight		Experiencee	
			Body height	Body weight	Experience	Sport class	Body weight	Experience	Sport class	Experience	Sport class	Sport class	
1	Foil (women)	14	-0.43	-0.53*	0.86***	0	0.57*	-0.38	-0.42	-0.62*	0.01	-0.17	4
2	Foil (men)	20	0.74***	0.57**	0.80***	-0.37	0.66***	0.62**	-0.44*	0.44*	-0.02	-0.02	7
3	Epee fencing (women	15	0.2	0.50*	0.44*	0.2	0.43*	0.52*	0.26	0.49*	0.27	0.21	5
4	Epee fencing (men)	20	0.32	0.49*	0.58**	-0.53*	0.77***	-0.05	0.41	0.07	0.15	-0.51*	5
5	Sword	18	-0.07	0.32	0.48*	0.15	0.33	0.01	0.01	0.61**	0	0.04	2
6	Women	29	-0.17	-0.09	0.69***	0.06	0.51**	-0.07	-0.21	-0.28	0.09	-0.09	2
7	Men	58	0.37**	0.47**	0.60***	-0.19	0.57**	0.12	0.1	0.36**	0.13	-0.22	5
8	Women. men	87	0.19	0.29*	0.62***	-0.1	0.67***	0.09	-0.12	0.21	0	-0.18	3
			2	6	8	1	7	2	1	5	0	1	33

* p<0.05 (0.217) significant
** p<0.01 (0.283) significant
*** p<0.001 (0.356) significant

Table 3. Correlation of results realisation of six tests evaluated level of abilities to maintain stabilny in those practising different kind of fencing (n=87)

Lp.	Field of fully developed force	n		Open eyes		Closed eyes			To tense returnable			
	Total leght		Open	Closed	To tense	Open	Closed	To tense	Open	Closed	To tense	
	Kind of fencing		eyes	eyes	returnabl	eyes	eyes	returnabl	eyes	eyes	returnable	
1	Foil (women)	14	0.57*	0.36	0.25	0.75**	0.92***	0.59*	0.54*	0.44*	0.92***	7
2	Foil (men)	20	0.69***	0.45*	0.04	0.06	0.58**	0.1	0.06	-0.09	0.95***	4
3	Epee fencing (women)	15	0.91***	0.79***	-0.08	0.37	0.59*	-0.29	-0.18	-0.31	0.96***	4
4	Epee fencing (men)	20	0.53*	0.12	0.03	0.21	0.66***	0.08	0.33	0.28	0.87***	3
5	Sword (men)	18	0.73***	0.68**	-0.03	0.36	0.63***	0.25	-0.01	0.11	0.81***	4
6	Women (foil. epee fencing)	29	0.74***	0.56**	0.08	0.55**	0.78***	0.3	0.26	0.22	0.89***	5
7	Men (foil. epee fencing. sword;	58	0.65***	0.43**	0	0.36*	0.62***	0.11	0	-0.02	0.85***	5
8	Women. men	87	0.68***	0.47***	0.04	0.43**	0.67***	0.17	0.11	0.08	0.87***	5
			8	6	0	4	8	1	1	1	8	37

* p<0.05 (0.217) significant
** p<0.01 (0.283) significant
*** p<0.001 (0.356) significant

Conclusions

1. No statistically significant correlation between the basic anthropometric indexes and selected elements of abilities to maintain balance was ascertained.
2. High correlation coefficients occurred, however, between the results of the particular tasks evaluating the abilities to maintain balance defined through coefficients of total length and the area of the extended surface.
3. This means that when analysing the coefficients of one of the two groups, we obtain complete information concerning the level of these abilities in the individual.
4. A moderate correlation appeared between the age and the training period, and a considerable one between: the age and the body mass, the height and the body mass, the body mass and the sport training period.

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Address for correspondence:
Włodzimierz Starosta
Instytut Sportu
ul. Trylogii 2/16, 01-982 Warszawa, Poland
phone: +48 (22) 834-95-07, e-mail: wlodzimierz.starosta@insp.wa.pl

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