

LEVEL AND CONDITIONS OF SELECTED MOTOR CO-ORDINATION AND JUMPING ABILITIES AMONG ADVANCED WATER-POLO PLAYERS

by

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Water-polo is considered as complex sport discipline. Players are required to have a high level of fitness and co-ordination abilities. Among fitness abilities there are strength, velocity and endurance, which are the basics of tactical actions and techniques. A general overview of motor abilities requires considering different co-ordination abilities, which level and conditions have not been researched completely. The potential of co-ordination is manifested in every movement, and it determines players' possibilities assigning their present condition of fitness workout. Therefore, it is justified to undertake research of various aspects of motor co-ordination. The objective of the research was to determine the level and dependence of the selected co-ordination and jumping abilities among advanced water-polo players of different age groups: 11 young juniors, 11 juniors, 13 seniors (Polish national team), 10 seniors (German champions). The authors used Starosta co-ordination and jumping tests (1978a, 1978b) in order to establish the level of motor co-ordination and jumping abilities. On the basis of the gathered material it was observed that juniors had the highest level of the selected co-ordination and jumping abilities. There were no significant relationships between motor co-ordination and jumping abilities. Besides, it was established that there were no significant relationships among the results of motor co-ordination and jumping abilities and somatic indexes. Having tested motor co-ordination, it was proved that left turns are the dominant ones among the majority of water-polo players.

Key words: motor co-ordination abilities, jumping abilities, water polo

Introduction

The high level of motor co-ordination abilities is conducive to success in sport team games. It also concerns water-polo – one of the games which action takes place in the water field. The research results of Markiewicz and

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Starosta (1998) showed that exercises in water – including playing water-polo – is conducive to improvement of motor co-ordination abilities among players participating in team games. The water environment is unusual for basketball, volleyball or handball players, whereas water-polo competitors consider it as a natural one. Therefore, we may claim that water-polo players should be characterized with a high level of motor co-ordination.

Success in this sport discipline is conditioned by well-thought-out tactical actions of the whole team and a high level of motor fitness of given players. However, effectiveness of individual actions depends - among other things - on high level of co-ordination and jumping abilities. The latter one means ability to raise ones body above the water surface.

The rivalry of players in a different environment inspired researches to analyze various aspects of water-polo. However, there have only been few published theses, which presented co-ordination abilities among water-polo players (Kos et al. 1997, Garbolewski et al. 1999). Therefore, the main aim of this work were to:

1. Determine the level of co-ordination and jumping abilities among water-polo players.
2. Determine the correlation between motor co-ordination and jumping ability.
3. Establish the correlation among the level of motor co-ordination, jumping ability, the basic somatic indexes and the age.

Material and methods

The research was conducted on 45 advanced water-polo players of different age (Table 1) – 11 young juniors (champions of National Youth Olympics), 11 juniors (Polish champions), 13 seniors (Polish national team players), 10 seniors (German champions). The research was carried out during the preparatory period in 2000. In order to measure the level of motor co-ordination and jumping ability Starosta's test (1978 a, 1978 b) was applied. The gathered material was analyzed statistically.

Table 1. Age, body weight and height of the water-polo players (average values – \bar{x} and standard deviation – S, n=45)

TEAM	N	Age (years)	Body weight (kg)	Body height (cm)
Young juniors	11	15,5±0,5	70,7±8,5	178,4±6,5
Juniors	11	17,5±0,6	76,1±11,4	181,4±5,4
Seniors – national team	13	22,2±2,6	83,7±6,9	187,2±6,6
Seniors – German team	10	27,1±2,3	87,2±7,4	189,5±3,7

Results

1. Level of selected co-ordination and jumping abilities

The highest level of motor co-ordination¹ was observed among juniors and the lowest was among seniors from Germany (table 2). The differences between young junior and junior teams ($r=0,59$; $p\leq 0,01$) and national team of seniors ($r=-0,43$; $p\leq 0,05$) were statistically significant.

The research also revealed that the movements were diversified according to the body side of the player, which is involved in the performance of tasks, i.e. right and left turns. The value of correlation factor between right and left turns is statistically significant among seniors of Polish national team ($r=0,84$) and team from Germany ($r=0,75$), which favored the left turn more than the right one. There was an insignificant statistical relationship in both junior teams, among which young juniors had better results performing left turns; however, right turns slightly dominated among juniors.

The smaller values of the correlation factor between directions of the turns among the juniors showed that the players with a high potential of motor co-ordination revealed a bigger symmetry of movement.

Table 2. Level and dependence of motor co-ordination and jumping abilities (n=45)

Team	Coordination							Total of turns in right and left			Jumping			r
	Turns right			Turns left			r				\bar{x}	S	V	
	\bar{x}	S	V	\bar{x}	S	V								
Y.j.	332,4	62,5	19,4	337,9	65	19,2	0,56	660,3	112,6	17,1	55,7	5,51	9,9	0,31
J.	351,6	20,7	5,9	349,2	39,2	11,2	0,44	700,8	51,7	7,4	56,8	6,81	11,9	0,34
S.n.t.	321,2	34,2	10,6	336,5	26,6	7,9	0,84*	657,6	58,4	8,9	54,5	5,64	10,3	-0,08
S.G.t	308,2	25,4	8,2	313,4	33,8	10,8	0,75*	621,6	55,4	8,9	52,9	4,01	7,6	0,33

* $p\leq 0,01$

Teams: Y.j.- young juniors, J.- juniors, S.k.P.-seniors, national team, S.G.t.-seniors, German team.

A similar tendency was noticed with regard to the jumping abilities. The highest values were observed among juniors ($\bar{x}=56,8$ cm), and the smallest ones were among German players ($\bar{x}=52,9$ cm). Within the limits of this ability, there were statistically significant differences between the youngest team and senior groups – Polish national team ($r=0,64$; $p\leq 0,01$) and German team ($r=-0,48$; $p\leq 0,05$).

¹ The expressions of coordination abilities and motor coordination are used interchangeably.

2. Correlation between the level of motor co-ordination and jumping ability

The analysis of results showed that there were positive, little correlation among juniors ($r=0,34$), seniors German team ($r=0,33$) and young juniors ($r=0,31$).

3. Correlation between motor co-ordination, jumping abilities and the basic somatic indexes

It was noticed that there was a moderate correlation between the age ($r=-0,49$), body height ($r=0,32$) and weight ($r=0,24$) among juniors within the scope of motor co-ordination. There was no significant relationship among other players from different teams.

Similar correlation was established with regard to the jumping abilities. The strongest and the most numerous relationships were noticed among juniors with regard to the age ($r=-0,57$), body weight ($r=0,57$) and height ($r=0,36$). The only significant relationship related with the age was observed among seniors from the Polish national team ($r=0,64$, $p\leq 0,05$).

Discussion

The conducted research proved that there was a higher level of motor co-ordination and jumping abilities among younger water-polo players than among seniors. It seems that the process of growing older reflects the lower level of examined abilities as a result of a long-term training. This phenomenon is caused by reducing the number of the new and complex co-ordination exercises.

The presented results may represent a comparative material for other team games, due to the choice of the applied tests. However, the conclusion needs to be interpreted cautiously, because the conducted research may not reflect the level of the tested abilities in the conditions similar to the specificity of water-polo. The lack of ground during a game may influence the research results, and a similar research – however, the one, which is carried out on the ground, may be different. Therefore, a further research, which will continue the stated objectives, should be conducted in a typical environment for water-polo, i.e. in water.

Conclusion

1. The highest level of the selected coordination and jumping abilities was observed among juniors and the lowest level was noticed among seniors (German team).

2. Insignificant relationships were observed between motor co-ordination and jumping abilities.
3. The highest correlation factors were among co-ordination, jumping abilities and somatic indexes, which were characteristic for juniors.
4. Having tested motor co-ordination, it was proved that left turns are the dominant ones among the majority of water-polo players.

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