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EVALUATION OF THE POLISH NATIONAL TEAM JUNIOR GOLF PLAYERS' ANAEROBIC FUNCION AND MOTOR CAPACITY

Key words: golf, junior golf players, Wingate test, motor capacity.

ABSTRACT

The aim of this study was the assessment of the start level of motor capacity and anaerobic function in juniors selected for the Polish National Junior Golf Players. No similar evaluations of this sport have been made in Poland.

The study was carried out on eight boys, aged 15–17 years and it consisted of eight tests being part of the International Test of Physical Fitness and a 30-second Wingate test on a foot-operated cycloergometer. A significant diversity of the examined golf players was observed during tests. Good and very poor results were achieved by individual subjects.

The results show that the examined athletes have not undergone comprehensive training and that their motor level is conditioned by body build resulting from natural development. The obtained results are diversified in respect to the individual level of anaerobic function. The majority of results display a low level of adaptation to physical efforts of this type.

INTRODUCTION

Golf is one of the most rapidly developing sports in Poland. More and more people take up play golf as the so-called, unranked sport [19]. Like in other countries, wealthier than Poland, golf is played to improve and keep physical fitness and health, to commune with nature and to be part of a specific community (regarded as an exclusive one) of golfers. Golf is also a spectacular sport, as it has gained wide recognition in the media and among business companies, which use golf in marketing and advertisements in return for financial benefits. Outstanding golf players have an extremely high sports skill level. And one has to genuinely start his golf sport training in one's childhood to be able to compete with the bests ones. The Polish Golf Association has established the Junior National Team to take part in European and World competitions. It is aimed to prepare young, talented athletes, in a regular and professional way to win laurels at the most important golf events of the world.

The aim of this study was to evaluate the start level of motor capacity and anaerobic function in juniors selected for the Polish National team.

So far there have been no similar evaluations of this sport in Poland, instead there have been numerous studies on golf biomechanics [5, 7, 12, 18, 25, 26] and psychological issues [6, 9, 16, 17]. Also papers on golf-related injuries and overstrains related to golf have been published. Knight's study

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[14] was devoted to golf training periodisation. This paper is aimed to extend the scope of golf literature by focusing on young golf players' physical fitness and function issues.

The evaluation of anaerobic function was carried out since the real physical effort of the golf player does not last longer than for two seconds. The energy from the strength and speed of the golf club is transferred into the ball during the strike. The power of 3000W is gained during a two-second movement. The average player makes about 80-100 strikes during one golf game with all his powers of concentration and maximum muscle tension [20]. There is no doubt that golf involves an anaerobic non-lactate effort.

METHODS

The study was carried out on eight boys, aged 15–17 (Table 1) on 9th – 11th of March 2007 in the Laboratory of Physical Effort Physiology at the University School of Physical Education in Wrocław under prof. dr hab. Marek Zatoń[1] management. A 30-second Wingate test on the foot-operated cycloergometer Ergomedic 839E coupled with a PC with M.C.E 2.3 system was used during the stress test. Loads were established individually at 75 g per 1 kg of weight. Each test was preceded by a five-minute warm-up on a specialist ergometer.

Table 1. Characteristics of examined golf–players

No.	Player	Height	Weight	Age	Experience (years)	Handicap
1.	M.W.	181.7	81.2	16	3	2.6
2.	J.Ż.	175.1	67.9	16	5.5	4.3
3.	M.SZ.	178.7	69.9	17	5	4.5
4.	J.P.	182.5	96.4	17	5	4.9
5.	T.P.	175.6	56.1	15	5	5.0
6.	K.B.	185.3	92.7	17	6	7.2
7.	G.Z.	176.4	61.6	15	9	8.9
8.	K.S.	180.4	74	15	3	9.1

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The following measurement results have been analysed:
- Peak power [W]
- Total work [kJ]
- Maximum power [W]
- Relative values of the above parameters [kJ/kg, W/kg]
- Attaining maximum power time [s]
- Sustaining maximum power time [s].

Also lactate concentration was determined in the examined players during the 3rd minute of rest. Measurements were carried out with DR LANGE LP 400 miniphotometer during LKM 140 test.

Motor capacity evaluation was carried out during eight tests being part of the International Test of Physical Fitness [24].

Basic anthropometric and body composition measurements were taken (adipose tissue, non-adipose tissue, percentage content of water and body mass index) on Futrex 6100/XL, Futrex INC.

RESULTS

Results of anaerobic function tests are showed in Table 2.

The results presented in Table 2 are scattered. The group of young golf players was not uniform in terms of their anaerobic function level. It looks like these players have not trained body metabolism, and the Wingate-test results are related to their body build and congenital predisposition. Values of some parameters determined by the Wingate test are undoubtedly related to the musculature. And the musculature is linked with young people's physical development [13].

Table 3 shows results of examined parameters of the players' body composition. Also in this case the diversity of the obtained values must be emphasized. The players were too fat (for their age) – the BMI index diverged from values set for athletes. These results revealed insufficient physical preparation of young golf–players.

The results obtained in individual tests of the International Test of Physical Fitness were recalculated into points (subject's age was also taken into consideration) (Table 4). Also the subjects' physical fitness was very diversified. The scattering of results was a proof of randomness.

It is a general rule that athletes representing given sports display a similar physical fitness type. The studied group of young golf players displayed characteristics of a group of untrained youth.

Table 2. Anaerobic function test in golf–players (Wingate test, 30 sec)

	Power peak value [W]	Total work		Power		Reaching maximum power time [s]	Holding maximum power time [s]	Lactate [mmol/l]
		kJ	KJ/kg	W	W/kg			
Maximum value	1028	24.18	259	1020	10.95	4.20	6.71	15.3
Minimum value	487	12.50	180	479	7.53	7.35	3.38	10.2
Mean value	–	17.48	233.86	722.29	9.64	5.55	4.27	–

Table 3. Body composition of examined players

No.	Player	Muscular tissue (KG)	Muscular tissue %	Adipose tissue KG	Adipose tissue %	Water KG	Water %	BMI
1.	M.W.	63.2	78	17.9	22	46.4	57	24.5
2.	J.Ż.	54.5	80	13.3	20	39.9	59	22.1
3.	M.SZ.	54.2	78	15.7	22	39.7	57	21.8
4.	J.P.	69.9	73	26.5	27	51.2	53	28.9
5.	T.P.	46.5	83	9.6	17	34.1	61	18.1
6.	K.B.	75.3	81	17.4	19	55.1	59	27
7.	G.Z.	50.4	82	11.2	18	36.9	60	19.7
8.	K.S.	58.5	79	15.4	21	42.9	58	22.7

Table 4. MTSP results obtained by players (in points)

	1000 m run	50 m sprint	Standing long jump	Trunk bends from a lying position	Shuttle 10 m sprint	Palm force	Pull–ups on a bar	Trunk bends	Total
Maximum value	58	58	63	65	64	62	62	54	462
Minimum value	51	30	48	47	49	38	39	28	299
Mean value	52.6	49.5	53.5	53.1	55.8	50.7	53.1	44.7	374.5

DISCUSSION

To discuss results obtained by examined group of golf–payers we have to compare obtained values with other, similar groups of young men practicing other sports. The 30-second Wingate test is a recognised method, so finding similar (in respect of age and number) groups in literature is not difficult, e.g. Cieśliński and Ciepiela [4], Jastrzębski [11], Obmiński et al. [22], Arslan [1], Gabryś et al. [8] or Kosendiak et al. [15].

A comparison of results obtained by above authors is presented in Table 5. We could state, when analysing the presented results, that the young golf players do not equal the anaerobic function level of representatives of sports in which

anaerobic lactate metabolism is dominant (weightlifting, wrestling, judo, 400 m run). Their results are similar to results of representatives of mixed-effort sports, e.g. football, handball. However Buśko et al. [3] found higher values in basketball players, who trained in the Sports Championship School in Warka. Maybe these results were influenced by regular training at the Sports School. The examined golf players had a higher power level than Turkish subjects [1], who lived a sedentary life and practised recreational exercises. Also it was demonstrated that the examined golf players have their anaerobic function similar to non-training students [21]. Subjects' age and sports skill level are of decisive significance as presented by Iskra and Jarząbek [10]. The Wingate test results of top Polish sprinters or results of the Polish Wrestling National Team [2] are much better.

In terms of physical fitness level measured with the International Test of Physical Fitness it must be stated [23], that it depends on biological age, biological development phase, body build and composition, and not only on sports training. That is why it can be noted during the analysis of the obtained results that physical fitness of the examined golf payers is diversified and that it falls into the average scope according to Talaga [24].

The obtained results show that the examined athletes have not undergone any comprehensive training, and that their motor level is conditioned by their body build resulting from natural development. The worst results were obtained in suppleness and shoulder belt strength tests, which seems to be in contradiction to golf demands. The obtained results are diversified in respect to individual anaerobic function level. The majority of

Table 5. Comparison of Wingate test results obtained by different sportsmen groups

	Golf–players	Handball players [4]	Footballers [4]	Weightlifters [4]	Junior footballers of Lechia Gdańsk [11]	Junior wrestlers [11]	Judokas [22]	Training men [1]	Not–training men [1]	Athletes and 100 m sprinters [8]	Athletes and 400 m sprinters [8]	Athletes and 400 m sprinters [15]
Total work [kJ]	17.48				16.80	18.10	21.00			17.79	21.10	20.03
Total work/1 kg of body mass [J/kg]	233.86	224.50	251.30	274.50	254.00	270.80	266.60			236.00	296.00	285.88
Power [W]	722.29				685.00	748.60	879.30	589.28	553.16	719.00	845.00	822.78
Power/1 kg of body mass [W/kg]	9.64	9.30	9.90	11.00	10.40	11.10	11.15	9.06	8.79	11.28	11.85	11.59
Reaching maximum power time [s]	5.55	4.90	5.70	4.70	3.55	4.01	3.30			6.23	5.50	5.01
Holding maximum power time [s]	4.27	4.20	4.60	3.80	3.70	3.92	3.10			4.98	5.48	4.29

results revealed a low level of adaptation to effort of this kind. Introduction of comprehensive loads into young golf players' training will not only improve their score, but also prevent injuries and overstrains.

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