

CHARACTERISTICS OF 16-YEAR-OLD HOCKEY PLAYERS RUNNING ACTIVITY DURING AN INDOOR HOCKEY GAME

(Preliminary communication)

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Abstract

Studying the dynamics of movement and the distance covered during competition is a very popular topic for researchers in sport games. Research and objectifying of running activity in indoor hockey (dynamics of movement and the distance covered), will contribute to a more effective and successful planning of the sport preparation of young hockey players. The subjects of the research were 18 competitors from the National Team of players aged up to 16 (5 attackers, 6 defensive mid-fielders and 7 defenders), who were observed during 20 matches of the Indoor Hockey National Championships. The mean value of the covered distance shows that 16-year-old hockey players cover between 2580 m and 2900 m during an indoor game. The greatest distance was covered by attackers and the smallest by defenders. The mean values of the velocity of movement vary from 0.76 m/s to 0.87 m/s. The greatest percent of the playing time during a match, players spend walking 46%, running slowly 27%, running fast 17%, standing 9% and only 1 % of total playing time - sprinting. We can conclude that in indoor hockey players cover approximately 3 times shorter distances compared to players in the outdoor game. The difference in the volume of movement is logical with reference to the smaller size of the playing field, but the major reason is due to the smaller playing periods: for outdoors - 2 periods of 35 minutes, for indoors - 2 periods of 20 minutes. Our research confirms that the characteristics of dynamic load indexes for hockey and indoor hockey are very close. On these grounds, we can make the conclusion that indoor hockey players have the necessary physical preparation to play outdoors, as well.

Keywords: *field hockey, indoor hockey, young hockey players, hockey competition, motor speed, movement in hockey, distance covered in hockey, speed ranges, mean, percentages*

INTRODUCTION

In order to improve the training process in sport, various techniques of observing competition have been introduced over recent years. Studying the dynamics of movement and the distance covered during a competition is a very popular topic for researchers in sport games. Research on these indexes is extremely important for better sport preparation of the young athletes, because it contributes to the optimization of means and methods of physical preparation. Similar kind of research has been conducted on the outdoor hockey (Konarski & Strzelczyk, 2009; Konarski, 2003).

Indoor hockey is the second discipline officially recognized by the International Hockey Federation (FIH). It is characterized with specific rules, different from the rules of hockey. The side-boards, as well as the unlimited number of substitutions of the six field players, make the game quite intensive throughout the playing time. The dynamic load during the 40-minute game requires a high level of sport preparation on the players' part. Research and objectifying of the running activity in competition – the dynamics of movement on the field and the distance covered, will contribute to a more effective and successful planning of the sport preparation of the young hockey players.

Table 1. Speed ranges according to Dan B. Dwyer and Tim J. Gabbett

Speed ranges	m/s
Standing	0.0 – 0.1
Walking	0.2 – 1.7
Running slowly	1.8 – 3.2
Running fast	3.3 – 5.6
Sprinting	5.7

Table 2. Mean; minimum and maximum distance covered and movement velocity in 16-year-old hockey players during an indoor hockey game.

INDEXES	N	DISTANCE (m)			SPEED (m/s)		
		<i>X</i>	Minimum	Maximum	<i>X</i>	Minimum	Maximum
1. Attackers	567	2900 m	2560 m	3380 m	0.83 m/s	0.21 m/s	2.44 m/s
2. Mid-fielders		2640 m	2300 m	2960 m	0.76 m/s	0.34 m/s	2.56 m/s
3. Defenders		2580 m	2240 m	3640 m	0.87 m/s	0.41 m/s	3.31 m/s

The aim of the research is to determine the distance covered by 16-year-old hockey players and the velocity of movement on the field during an indoor hockey game.

METHODS

The research was conducted in 2013, during the Indoor Hockey State Championships for young players aged up to 16. The subjects of the research were 18 competitors from the National Team of players aged up to 16 (5 attackers, 6 defensive mid-fielders and 7 defenders), who were observed during 20 matches of the Indoor Hockey National Championships. The matches consisted of two periods of 20 minutes and a half-time interval of 5 minutes.

For the research, we used Sunnto t6 watches with a foot pod – an additional device to register the running activity, attached to the shoes. The device was calibrated at a 100m stretch before each study. The recorded data were transmitted to a computer by USB and were analyzed by a specialized software program – Moviescount and Sunnto training manager. The acquired data were processed by the SPSS statistical program to determine the mean value and standard deviation.

We used the Tables of Dan B. Dwyer and Tim J. Gabbett to determine speed ranges. According to their research, speed ranges presented in the Table should be used in hockey (Table 1).

RESULTS

The research results are presented in Table 2. The mean value of the covered distance shows that 16-year-old hockey players cover between 2580 m and 2900 m during an indoor game. The greatest distance was covered by the attackers and the smallest – by the

defenders (Figure 1). The mean values of the velocity of movement vary from 0.76 m/s to 0.87 m/s, which according to the speed ranges presented in Table 1, turns into walking. The maximum speed registered is 3.31 m/s - with the defenders (Table 2).

Speed ranges are presented in Table 3. The results show that 16-year-old hockey players spend walking (46%) the greatest percent of the playing time during a match, 27% running slowly, 17% running fast, 9% standing and only 1% of the total playing time - sprinting.

Table 3. Movement velocity 16-year-old hockey players

	SPEED RANGES	% of total playing time
1.	Standing	9%
2.	Walking	46%
3.	Running slowly	27%
4.	Running fast	17%
5.	Sprinting	1%

DISCUSSION AN CONCLUSION

The aim of our research was to determine the velocity of movement of 16-year-old hockey players and the distance covered during an indoor hockey game. Using a GPS to study the same issue with outdoor elite hockey players from the National Team of Poland, Konarski establishes that hockey players cover 10 000 m on average. According to his studies, the greatest distance is covered by the attackers – 10 870 m, followed by the defensive mid-fielders – 10 300 m, and the smallest distance is covered by the defenders – 9 300 m (Konarski, 2003). The average speed of movement is within the range of 2.2 – 2.59 m/s (Konarski, 2003). In his studies on the outdoors hockey, Spencer determines that during the match, hockey players spend 46.5% of playing time walking, 40.5% running, 7.4% standing, and 1.5% sprinting (Spencer, et al., 2004).

There is no similar research for on the indoor hockey, but it can be stated that the game is quite dynamic and requires a high level of speed and speed-strength qualities from the players (Konarski & Strzelczyk, 2009).

The research results show that the attackers covered the greatest distance - 2900 m, followed by

the defending mid-fielders - 2640m and the smallest distance was covered by the defenders - 2850m (Table 2). If we compare these results with Konarski's studies on the outdoor hockey, we realize that the differences in distances covered outdoors depending on the players' positions, are reciprocated indoors. With reference to speed range, it becomes clear, that 16-year-old hockey players move walking – 46% for the greatest part of the playing time, followed by 27% - running slowly, 17% - running fast, 9% - standing, and only 1% - sprinting.

From the acquired results we can conclude, that in indoor hockey players cover approximately 3 times shorter distances compared to the players in the outdoor game. The difference in the volume of movement is logical with reference to the smaller size of the playing field, but the major reason is due to the shorter playing periods: for outdoors - 2 periods of 35 minutes, for indoors - 2 periods of 20 minutes. Our research confirms that the characteristics of dynamic load indexes for hockey and indoor hockey are very close. On these grounds, we can make the conclusion that the indoor hockey players have the necessary physical preparation to play outdoors, as well.

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