

Jump and Lunge Frequencies Analysis during Men's Single Badminton Matches: Implications on Physical Conditioning Training

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Abstract

The objective of this study is to determine the jump and lunge frequencies performed during men's single badminton matches during world class level tournament. Players' jump frequencies were calculated in the whole matches. Lunge frequencies were presented in the position performed in the court. The findings of this study will be beneficial as it can be used as a reference for developing training program besides technical and tactical plan during real matches.

Keywords: Badminton, Jump, Lunge, Asymmetry, Physical Conditioning.

1. Introduction

Badminton is an intermittent sport characterized by multiple intense actions [1] including fast accelerations, decelerations and many explosive movements with changes of direction over short distances [2-5]. The current rules states that a badminton singles match consists of the best of three games, in which the first player to score 21 points will win the game. When one of the competitors get 11 points, 60 seconds break will be given to both players and when a game finished, 2-minutes break will be given before proceed to another game [6].

In the process of designing a good training program, it is important to know about the physiological responses and activity profile during a match [7, 8]. The international single matches may be played around 15 to 90 minutes with the duration to get each point varies from a few seconds to several minutes [9, 10]. However, many rallies often ended in less than ten seconds [11] and involved sporadic, explosive and repetitive actions thus make the game as a high intensity game [5, 9]. In order to deal with the high intensity demand, explosive strength and anaerobic power are vital for the players and accordingly it has been found that anaerobic alactacid power and maximal strength are high among elite badminton players [3, 9].

As a way to enhance performance in sports, apart from in-field or in court training, athletes are recommended to adopt strength training into their training routine. Strength training is a type of physical exercise performed to improve muscular strength by gradually increasing the ability to resist force through the use of free weights, machines, or the person's own body weight. Strength training sessions are designed to impose increasingly greater resistance, which in turn stimulates development of muscle strength [12]. Strength training is now widely recognized for its great value for all those interested in optimizing health, fitness and functional-

ity [13, 14]. Through various researches, the concept of specificity in training has received considerable mention and attention over the past decade [12, 15]. Thus, it is important to analyse the movements been performed in a specific sport as the more similar the training activity is to the actual sport movement, the greater the likelihood of positive transfer to performance [12].

Based on the observation, it can be seen that jump and lunge are among the movements that always been performed in a badminton game. Jump always been performed during smash, in which players try to hit the shuttlecock with power and speed downward to the opponent's court. Lunge on the other hand always been performed in order to return the shuttlecock to the opponents mainly when the shuttlecock is hit far from the player's current position in the court. It is the aim of this study to examine the frequencies of jump and lunge performed in badminton matches. This study will be useful as a proof for the importance of jump and lunge exercises to be included during physical conditioning training.

2. Methodology

Men's single matches during a world class level championship were obtained. Players' jump and lunge performed in the matches were notated using notational analysis. Jump is defined as the movement in which players push him off a surface and into the air by using the legs and feet. The jump is analysed without considering the positions in the court. The lunge was analysed based on the position in the court that are fore right, fore left, mid right, mid left, rear right and rear left (Figure 1).

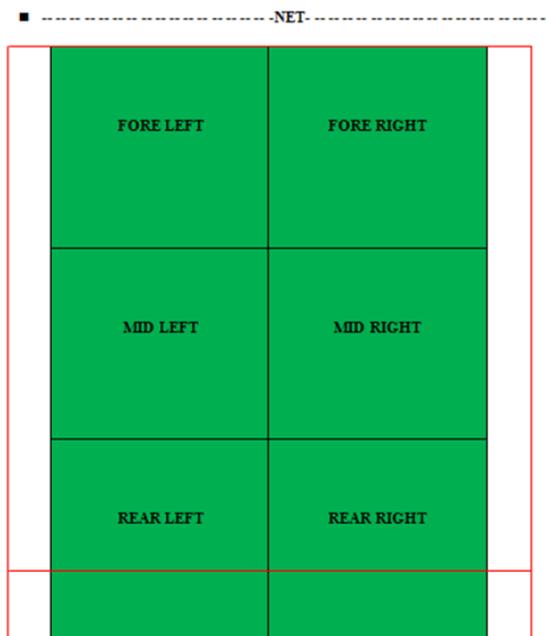


Fig. 1. Position in court

3. Results

Table 1: showed the lunge and jump performed in a badminton match.

Movements	Frequencies		
	Set 1	Set 2	Totals
Lunges			
Fore			
Fore right, right foot	41 ± 4	32 ± 5	73 ± 7
Fore right, left foot	3 ± 2	2 ± 2	5 ± 2
Fore left, right foot	52 ± 3	48 ± 6	100 ± 10
Fore left, left foot	4 ± 2	3 ± 1	7 ± 1
Mid			
Mid right, right foot	20 ± 5	18 ± 6	41 ± 7
Mid right, left foot	0	0	0
Mid left, right foot	6 ± 2	3 ± 3	9 ± 3
Mid left, left foot	11 ± 4	19 ± 4	30 ± 5
Rear			
Rear right, right foot	3 ± 1	2 ± 1	4 ± 2
Rear right, left foot	2 ± 1	2 ± 1	4 ± 1
Rear left, right foot	5 ± 2	2 ± 1	7 ± 3
Rear left, left foot	2 ± 1	2 ± 1	4 ± 1
Jumps			
	27 ± 3	35 ± 9	58 ± 7

Table 1. Jump and lunge performed in a badminton match

4. Discussions

The objective of this study was to determine the jump and lunge frequencies performed during men's single badminton matches during a world class level tournament. Players' jump frequencies were calculated in the whole matches. Lunge frequencies were presented in the position performed in the court.

Looking at the result, we can see that badminton players perform at almost 300 lunges movement in a game. Coaches and players need to take note on this especially those that did not implement lunge as one of their training exercise. 264 lunge movements are very high, as each of the lunges will exert force almost similar to their bodyweight (16, 17). By including lunge as one of the train-

ing exercise would benefit the players in terms of how to perform the movement in correct way, as wrong technique will always imposed the players to risks of injuries. The lunge is very important in a badminton game especially to return the shuttlecock. The opponent always send the shuttlecock as far as possible from the players, so lunge is one of the fastest alternative to reach the shuttlecock. Inability to perform good lunge will slower the player to return back to ready position and thus will cause the opponent to have a big advantages.

Looking more specific, we can see that most lunges were performed at the fore site of court. This means that the opponent always sent the shuttlecock to the front part. One of the main points to be discussed from the result is how the players perform the lunge. We can see that, no matter right or left the shuttlecock were sent, the players will tend to use the same leg (right leg) to reach the shuttlecock. This means that, if 100 times the shuttlecock were sent to the front, the right leg will have to perform 100 times of lunge. This demonstrates the possibility of asymmetry exists (16, 18, 19) among the players even the players that we analysed are in a very high level. The numbers of lunge perform laterally and to the back are also quite high. Thus players should also include lateral and reverse lunge in their training program.

Next, looking at the jumping frequencies, it was found that a player will perform at averaged of 58 times jumping movement in a match. As a jump might stress at least three times our bodyweight, jumping is definitely compulsory to be included in a training program. As we can see in the result, the number of jump performed increased in the second set. Without enough muscular and power endurance, players would not be able to perform the jump in the second set. What is feared more is when the players landing. Fatigue muscles used during lunge and jumping might cause players to be unable to land safely and this might induce greater risks of injury.

5. Conclusion

Findings of this study revealed the number of lunge and jump frequencies performed by players during a singles badminton match. We can see that the numbers of lunges are very high especially to the front part of the court. Thus, it is a need for the players to include forward lunge in their training program. Training both sites of limbs is very important to avoid asymmetry, which if exist, will cause the players to depend only in the stronger sites, thus also increase the risks of injury due to overused. Players are also encouraged to have proper plyometric training as jumping frequencies were also shown to be very high in a game. This study is hope to be used as a guideline for the coaches and players to plan and implement a good physical conditioning training program in order to increase performance and reduce the risks of injuries that might happen during the real game.

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