

BIOMECHANICAL ANALYSIS OF STRIDE FORCE IN THE ELITE BADMINTON PLAYER

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KEY WORDS: badminton, stride force, kinetics

INTRODUCTION: In current badminton competition, the movement of the player is becoming faster and faster. This requires not only basic strength for the basic footwork of players, but also more explosive force in lower limbs which is important for improving moving speed of player on the court. In this study, a method has been developed for the measurement of the propulsive force of one leg during a stride of the elite badminton player. This will provide reference for the training of the badminton player.

METHODS: Sixteen national badminton players were recruited as subject in this study. One Kistler 3-D force plate and one video camera were employed in this study. Four shuttles were suspended approximately 1.2m high and around the 3-D force plate, two of them near the net and the others near the end line of the court. The distance from force plate to the connection line of two front shuttles was 2.8 to 3 meters, adjustable regarding to the player's height, and the distance between these two front shuttles was 3.5 to 4m. The distance between the shuttles near the end line and the center of the force plate was 1 meters. The player, who is facing front for the whole test, strides from the force plate with the dominant leg to hit the suspended shuttles. This is recorded for two consecutive trials from each direction. There was a one-minute rest period between the trials. The push off force was sampled at a frequency of 220Hz. Meanwhile, the movement of the players was recorded by a video camera, which was in front of the player to determine the height of their jump. The propulsion force and trials extension duration of stride in four directions of each player was compared.

RESULTS AND DISCUSSION: Results revealed that an accurate comparison of the propulsive force in stride to each direction could be made. The male and female single player's propulsion force to left back court was stronger than other players and male and female double player's propulsion force in stride right toward back court was stronger than other players. The men and women's single players' force of stride left was stronger, and woman's double players' stride right was stronger. Regarding the extension duration in stride left and right, measurements for single player were the opposite of the double player. This characteristic was more obvious than that of the propulsion force.

CONCLUSION: According to the male player's extension duration in stride toward left and right front court, toward left side was better than the right side, thus player's right side front court could be a weak area in the competition.

Compared with the single player, the double player's extension duration in stride toward front right side is relatively shorter, and propulsion force was relatively stronger. This enable them to perform more attacking point in right front court.

From the collected data, the players have a strong ability in left back stride (except man's double) and the quality of jump attack in left back court was relatively good.