

## LOCOMOTOR DISTANCE AND VELOCITY IN WHEELCHAIR BASKETBALL GAME

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**KEY WORDS:** DLT method, locomotor distance, peak velocity.

**INTRODUCTION:** The rule of basketball was vastly revised in 2000 classification and it is expected that basketball players' speed would be higher and locomotor distance would be longer than before. The revision of the rule applied to wheelchair basketball as well. There have been few studies about players' speed and locomotor distance with an exception of Coutts' study (1992) which was published before the rule revision. The objects of this study were to investigate the players' locomotor distance and velocity in a wheelchair basketball game and to get the basic data of the players' physical fitness level necessary for high performance in wheelchair basketball.

**METHOD:** The match filmed for this study was the final of the Wheelchair Basketball Asian Friendship match final (Japan vs. Korea). A Hi-Vision video camera (Sony,HDR-FX1) was set at the highest place of the audience seats where we could glance over the all court. Two-Dimensional DLT(or FLT)method was used to obtain positional changes of all the players who participated in the game. Center of the two wheels of each player's wheelchair was digitized 3 frames per seconds.

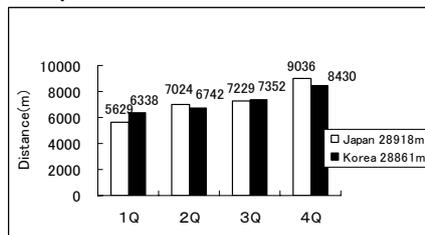


Fig1. Change of locomotor distance

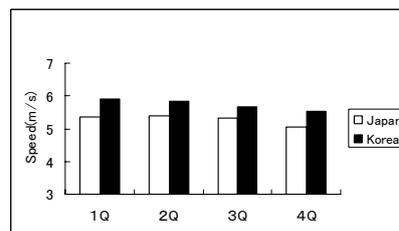


Fig2. Change of peak speed

**RESULTS:** Total locomotor distance of all the players during the game was 28,918m for Japan, and 28,862m for Korea, respectively. Peak velocity of each players ranged from 5.20m/s to 6.53m/s. Locomotor distance covered in each quarter increased (Figure1), and peak velocity tended to decrease (Figure2) as quarters advanced. Locomotor traces of players showed that many players stayed long near the own goal when the team was defending and they covered large area of the front court when the team was attacking.

**DISCUSSION & CONCLUSION:** The results acquired in this study were much greater than Coutts' results (locomotor distance: 4752m, peak speed: 4.03m/s). The reason of the difference of the results between two studies is not totally clear, we may attribute it to several reasons, such as team tactics, players' level, the rule revision and improvement (weight saving) of the wheelchair. Because the data were obtained in one specific game, the acquired tendency may not be always common in all the games. However physical abilities to keep running all over the game period (40minutes) and to maintain the peak speed would be very important regardless of the game. The data obtained in this study is useful for evaluation of the ability both of players and the team.

### REFERENCES:

Coutts KD. (1992) Dynamics of wheelchair basketball. *Medicine and Science in Sports and Exercise* 24(2):231-234