

授与機関名 順天堂大学

学位記番号 甲第 90 号

## Jumping ability is related to change of direction ability in elite handball players

(エリートハンドボール選手の跳躍能力と方向転換能力の関係)

勝又 健太 (かつまた けんた)

博士 (スポーツ健康科学)

### Abstract

In team sports, the speed of both straight and directional movements, such as running with a COD, is a clear determinant of performance. This study is the first to analyze SLJ ability and COD deficit parameters of handball players. This study investigated the relationship between vertical and horizontal jumping ability and change of direction (COD) to measure athletic performance in 51 elite male handball players. Countermovement jump (CMJ), peak power, and standing long jump (SLJ) were measured. Participants performed a 20-m sprint test (time measured at 5, 10, and 20 m) and a zigzag test (COD: 135°, 90°, and 45°). The COD deficit, an index of the time required for COD, was calculated. The correlations between CMJ height and zigzag test times were relatively large (at 135°,  $r=0.607$ ; at 90°,  $r=0.594$ ; at 45°,  $r=0.613$ ;  $p<0.01$ ), whereas those between CMJ height and COD deficit were moderate (at 135°,  $r=0.399$ ,  $p<0.01$ ; at 90°,  $r=0.350$ ,  $p<0.05$ ; at 45°,  $r=0.323$ ,  $p<0.05$ ). SLJ showed a negative moderate correlation with COD deficit (at 135°,  $r=0.439$ ,  $p<0.01$ ; at 90°,  $r=0.469$ ,  $p<0.01$ ; at 45°,  $r=0.380$ ,  $p<0.01$ ). We found that the SLJ of elite handball players is strongly associated with their COD ability. Sprinting ability is also strongly related to COD, and there is a significant correlation between, 135° zigzag test, and CMJ, indicating that vertical jumping ability is related to sharp angle changes. Therefore, lower limb strength plays a role in COD ability at sharper angles.