THE RELATIONSHIP BETWEEN VERTICAL JUMP HEIGHT AND ROTATIONAL POWER WITH NORMAL AND FAST DRIVER CLUB HEAD SPEED IN DIVISION I NCAA MALE GOLFERS

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Introduction

The ability to rapidly develop force or produce power should be one of the objectives of strength and conditioning programs designed for golfers. Lower body power production and pelvic rotational power production appear to be contributors in the ability to generate club head speed (CHS). The countermovement jump (CMJ) is often used to assess lower body muscular power. Rotational power at the pelvis during a simulated golf swing can be assessed with a linear positioning transducer. In order to design strength and conditioning programs to specifically increase CHS in golfers it is important to know what performance measures are best correlated to CHS and are considered to be predictors of CHS. Therefore, the purpose of this study is to determine the correlation of lower body power produced during a CMJ and pelvic rotational power produced during a simulated golf swing with normal CHS (NCHS) and fast CHS (FCHS). NCHS is the CHS generated during a swing typically taken off the tee by the golfer and FCHS is the CHS generated by the player when instructed to swing as fast as possible.

Methods

11 collegiate male golfers participated in this study (n = 33; age; 21.31 ± 1.70 years, height; 69.97 ± 3.47 in, body mass; 183.69 ± 34.62 lbs). The CMJ was utilized to assess the jump height. With their hands by their sides, participants began the CMJ by test by performing a fast countermovement of their lower limbs to the 90-degree position and then jumping as high as possible. Participants were allowed to use a backward arm swing as they flexed their knees to the 90-degree position and forward as they extended their knees into the jump. Participants were instructed to land in the same point of takeoff. Measurements were collected with the JustJump Mat® (Probotics Inc., Huntsville, AL) and closely follow valid and reliable methodological approaches utilized within previous research (Kucic et al., 2020).The best attempt of three attempts was recorded for jump height. Pelvic rotational power was recorded using a linear positioning transducer (Tendo Sport, Tencin, Slovak, Republic) at three different loads (12%, 15%, and 18% of body mass) entered into a Keiser Functional Trainer (Keiser Corporation, Fresno, CA) with the cable from the Keiser attached to a What's That Strap (Progressive Resistance Inc.)) to allow for a simulated golf swing and measurement of power at the pelvis. Data was analyzed using IBM SPSS statistics (Version 24.0; IBM Corporation, New York, NY). Descriptive statistics were calculated in order to summarize results from the dataset.

Results and Discussion

Results from this study revealed that CMJ (24.17 ± 2.74 in) performance was within the normal range and comparable to most other athletic populations. The average peak power (PP) in Watts for 12%, 15%, and 18% of body mass (BM) were 555.59±382.04W, 681.12±487.78, and 779.03±515.07W respectively. Peak Power for each participant was recorded as the highest power generated out of three simulated swing attempts at each load (12%, 15%, and 18% of BM). Correlation analysis between the CMJ height and pelvic rotation PP to FCHS and NCHS were examined and the results indicated that there was no significant ($p>0.05$) correlations found between the CMJ height, 12%BM PP, 15%BM PP, or 18%BM PP and FCHS. However, for the correlations between CMJ height, 12%BM PP, 15%BM PP, and 18%BM PP and NCHS there was a significant ($p<0.05$) correlation found between 18%BM PP and NCHS and no significant ($p>0.05$) correlations found between CMJ height, 12%BM PP and 15%BM PP and NCHS. The results indicate that for the most part, the lower body power and pelvic rotational power measures did not significantly correlate with FCHS or NCHS. It is important to know that even though significant correlations were not found, with the exception of 18%BM PP and NCHS at this time, this is ongoing research. The collection of more of this data is planned and will provide a better sample from which to derive comparisons.

Significance

Competitive golfers today are much more focused on fitness, strength, and power than ever before. This is clear by simply watching professional and collegiate golf in person or on TV. The potential to hit the ball further due to increased development of a player's strength and power is known along with improvements with ball and club technology and individualized instruction. Golf specific strength and conditioning programs are important for player performance and identifying physical strengths and weaknesses a player may possess. If weaknesses exist we can adjust programming to strengthen that particular measure.

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References

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