

A Comparison of Lower Extremity Joint Power in the Squat and Deadlift

TEIGE J. BARRET¹, SEAN M. CONBOY¹, & KEVIN H. CHOE^{1,2}

¹Department of Kinesiology; Whittier College; Whittier, CA

²Center for Sport Performance; Department of Kinesiology; California State University, Fullerton; Fullerton, CA

Category: Undergraduate

Advisor / Mentor: Choe, Kevin (kchoe@whittier.edu)

ABSTRACT

The squat (SQ) and deadlift (DL) are commonly utilized to improve sport performance. An important variable in sport performance is joint power, as greater joint power has been associated with adaptations that improve performance such as higher vertical jump height. Therefore, picking exercises that result in greater joint power production can be beneficial in improving sport performance. **PURPOSE:** The purpose of this study was to compare joint power at the hip, knee, and ankle between the SQ and the DL. We hypothesized that the DL will have greater hip joint power, while the SQ will have greater joint power production at the knee and ankle. **METHODS:** 28 healthy participants (17 male, 11 female, 23.7±4.0 yrs., 1.76±0.09 m, 78.10±10.91kg) who had trained the SQ and DL at least once per week for the last three months were recruited for data collection. 2 visits were required from each participant with the first visit involving one-repetition-maximum (1RM) testing. During the second visit, participants underwent 3-D biomechanical analyses for the SQ and DL at 85% 1RM for each exercise in a randomized order, with a five-minute rest period. The 2nd of the three repetitions was used for analysis. Separate paired samples T-tests were used to compare peak joint power at the hip, knee, and ankle between the SQ and DL. **RESULTS:** Knee joint power was greater in the SQ compared to the DL (1.09±0.88 vs 0.53±0.44 W/kg⁻¹, p=0.002), as well as ankle joint power (0.32±0.33 vs 0.13±0.11 W/kg⁻¹, p=0.009). No differences were found in hip joint power (p=0.052). **CONCLUSION:** Because the SQ resulted in greater joint power at the knee and ankle, the SQ could be more beneficial than the DL if the goal is to improve sport performance, particularly sports that involve vertical jumping. However, there are other factors other than joint power that need be assessed before drawing final conclusions.