

Force Production Asymmetry and Jumping Performance in Baseball Players

Exercise Science

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Purpose

Recently, the relationship of force production asymmetry and specific performance tasks has been examined. Concerning jumps, these relationships have been examined via kinematic variables assessed with integrated force-time data. The purpose of this study was to evaluate this relationship via a direct kinetic and kinematic approach.

Methods

16 collegiate baseball players (82.1 ± 4.2 kg) performed unloaded (0 kg) and loaded (20 kg) squat (SJ) and countermovement (CMJ) jumps during this study. Kinetic data were collected via 2 adjacent force plates collecting data at 1000 Hz, while kinematic data were collected with a 6-camera 3D motion capture system (240 Hz). Kinetic asymmetry was then correlated with kinematic performance variables.

Results

No statistically or practically significant relationships were observed with kinetic asymmetry variables and vertical center of mass displacement (COMd) in either condition of the SJ or the CMJ. All relationships were in the trivial to small range ($r = 0.0 - 0.3$, or $r = 0.0 - -0.3$).

Conclusion

While mediolateral COMd may be altered by force production asymmetry, it appears that the weaker side may not influence the overall vertical COMd of jump performance. As suggested by a previous computer simulation study, the stronger side or the side producing more vertical force may be making up for the lack of force production of the other side. The lack of consistency in findings in all studies of bilateral strength asymmetry and vertical jumping performance illustrate the necessity of replicating research.

Link: <https://s3.us-east2.amazonaws.com/lagrangecollegecitations/JoynerSEACSM.pdf>

Citations Journal of Undergraduate Research

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