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INTRODUCTION

- Optimizing athletic performance in collegiate women's soccer requires a comprehensive understanding of maximal strength and neuromuscular performance
- Increasingly, sports scientists evaluate these metrics with a variety of equipment
- Force plate assessments provide detailed insights into an athlete's overall force production, rate of force development, explosiveness, and movement mechanics, while maximal strength tests (1-repetition maximum [1RM]) are assessed as a practical measure of muscular strength
- Previous research has demonstrated a relationship between these values in multiple athletic populations; however, research is lacking in female, NCAA Division I athletes.

PURPOSE

This study aimed to profile the neuromuscular performance of Division I women's soccer players prior to off-season training using force plates and maximal strength testing, identifying key performance indicators and exploring their relationships.

METHODS

- Fourteen Division I women's soccer players completed two testing sessions of lower body force plate assessments and maximal strength tests, separated by 48 hours
- Athletes completed three trials of an akimbo countermovement jump (CMJ), with the highest of the trials used for analysis
- Force plate metrics included peak propulsive force, modified reactive strength index (mRSI), jump height, and takeoff velocity
- Maximal strength was assessed using a 1RM back squat, following NSCA protocols
- Descriptive statistics were calculated to profile team performance, and Pearson correlation coefficients were used to explore relationships between force plate metrics and maximal strength
- Alpha was set at $p \leq 0.05$

RESULTS

Age (yrs)	20.7 ± 1.4
Height (cm)	167.4 ± 6.4
Weight (kg)	63.2 ± 6.9
CMJ Height (m)	0.28 ± 0.03
mRSI	0.36 ± 0.07
Peak Propulsive Force (N)	1406 ± 188
Takeoff Velocity (m/s)	2.33 ± 0.13
Back Squat (kg)	81.2 ± 13.0
Relative Back Squat (kg·kg ⁻¹)	1.28 ± 0.14

Table 1. Athlete Demographics

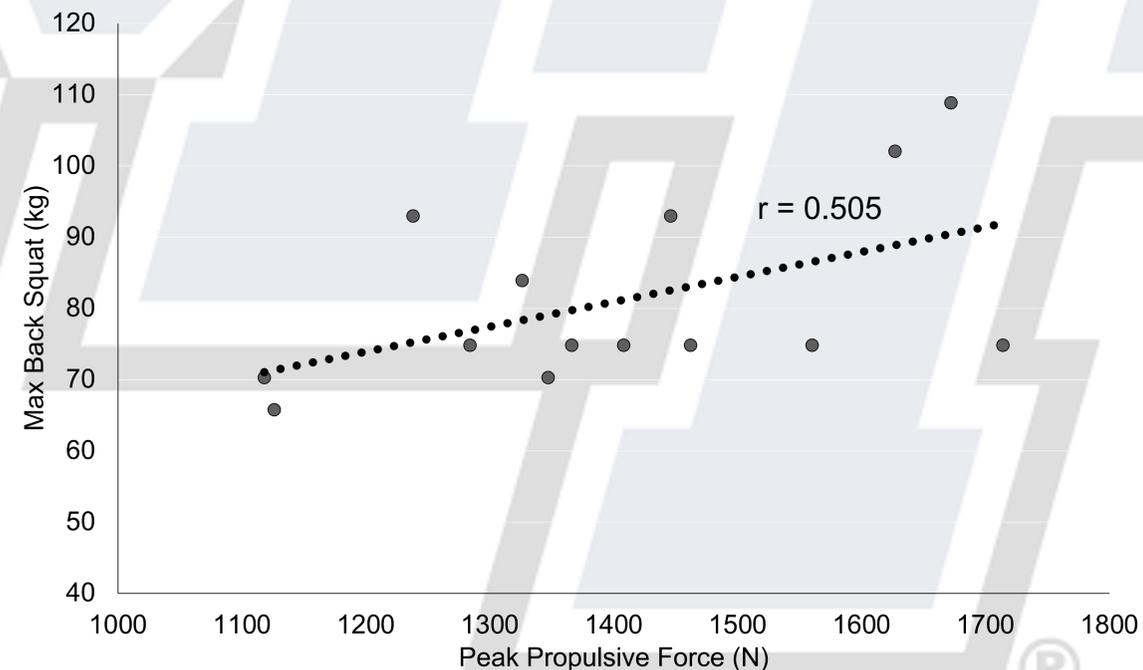


Figure 1. Correlation between Peak Propulsive Force and 1RM Back Squat

CONCLUSIONS

- This study highlights the key neuromuscular characteristics relevant to soccer performance, including lower-body force production, explosive power, and maximal strength
- These soccer players demonstrated similar relative strength values to data from other studies, but may benefit from increased focus on speed and power training to improve CMJ height and other force plate metrics
- Lower body maximal strength showed a moderate correlation with lower body power, indicating that explosive power may be a more critical performance attribute for soccer players

PRACTICAL APPLICATIONS

- Regular integration of force plate and strength testing can
 - Monitor training progress
 - Inform return-to-play decisions
 - Ensure maintenance of strength and power across the annual training cycle
- Combining force plate data with traditional strength measures provides a comprehensive approach to athlete performance monitoring
- Due to the lack of relationship seen between 1RM back squat and power metrics, strength and conditioning professionals may benefit from programming more explosive training protocols when working with female soccer players to better translate performance onto the playing field

