COMPARISON OF ISOMETRIC FORCE PRODUCTION IN DIVISION ONE COLLEGIATE MALE SKILL AND LINEMAN FOOTBALL PLAYERS

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INTRODUCTION

- Rate of force development (RFD) is exerting maximal or near maximal force throughout a specific range of motion (Haff et al., 2001)
- For this study, lineman consists of the centers, guards, tackles, and defensive end positions. Whereas skill players include wide receivers, tight ends, running backs, quarter backs, corner backs, safeties, linebackers, punters, and kickers.
- Studies have examined the correlation between the isometric midthigh pull (IMTP) and other variables such as, squat jump, counter movement jump (Thomas et al., 2015), one repetition maximum tests (McGuigan et al., 2008), and other sport related tasks (Thompson et al., 2013).
- Many studies have highlighted the differences of these groups in professional or youth settings by examining variables such as their injury rates, physiological demands, as well as various athletic measures including strength, speed, and power (Grgic et al., 2022).
- Skill players tend to be quicker and faster while lineman have more absolute strength.
- However, there is a paucity of research comparing the relative rate of force development and force production between lineman and skill players at the collegiate level.

PURPOSE

- The purpose of this study is to examine the differences isometric strength production between collegiate skill and lineman football players.

METHODS

- A total of 91 athletes (Skill = 54, Lineman = 37) did one to two trials of the isometric mid-thigh pull with force platforms collecting kinetic data and the best trial being used for analysis.
- Measures from the isometric mid-thigh pull include relative peak force, time to peak force and rate of force development (RFD) at epochs of 50ms, 100ms, 150ms, 200ms, 250ms.
- A series of Mann-Whitney U tests were conducted to examine the differences of each dependent variable between the two categories.

RESULTS

- There were no significant differences between the groups for any of the dependent variables listed above.
- More specifically, there were no differences in relative peak force, rate of force development at 50ms, at 100ms, at 150ms, at 200ms, or at 250ms.

CONCLUSION

- There appears to be no significance in either the skill or lineman groups for the relative rate of force development, time to peak force, or relative peak force.

PRACTICAL APPLICATIONS

- The aim of this study was to examine the differences between lineman and skill players. With no significance found in this study coaches can be assured despite the different demands of each position there will be little to no differences in maximal force generated by their football players.

References

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Table 1. Represents descriptive statistics of the isometric mid thigh pull variables

	Peak Force/ BW	Time to Peak Force	RFD 50ms	RFD 100ms	RFD 150ms	RFD 200ms	RFD 250ms
Skill	2.7 ± 0.4	3.3 ± 1.6	62.7 ± 58.5	55.9 ± 48.0	50.6 ± 40.4	44.8 ± 34.4	39.1 ± 28.2
Linemen	2.6 ± 0.45	3.5 ± 1.5	54.0 ± 66.3	44.7 ± 42.2	40.8 ± 35.4	38.6 ± 29.4	34.8 ± 24.5
U-Value	1522.0	1228.0	1496.0	1517.0	1536.0	1465.0	1482.0
p-value	0.20	0.52	0.27	0.22	0.17	0.37	0.31

RFD = Rate of Force Development, BW = Body Weight, RFD is normalized to body weight in kilograms