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Introduction

One-week off-season training camps are common in high school athletics. Understanding the effectiveness of these camps can guide optimal training methods. The isometric mid-thigh pull (IMTP) test is often used to quantify an athletes' maximal isometric strength.

Purpose

To evaluate the impact of a five-day consecutive speed and agility training camp on IMTP performance.

Methods

Twenty-five athletes (8 male, 17 female) participated in the study. Athletes completed two IMTP trials, two minutes apart, during pre- and post-testing. The athletes held a two-second quiet stance before beginning each trial. Athletes pulled maximally for five seconds before relaxing. Force plates captured forces with a sampling frequency of 1000 Hz. Measures of interest included maximal force, average rate of force development (RFD), and RFD during various time windows. During the consecutive 5-day training camp, athletes participated for three hours of training each day. Training days emphasized upper body mechanics, lower body mechanics, indoor and outdoor agility exercises, lifting technique focus, and plyometrics. Upper body mechanics focused on upper extremity form during sprints and direction changes, while lower body mechanics focused on power production and momentum conservation. Lifting technique training focused on movements involved with major lifts and power exercises such as the power clean. Plyometrics training involved impact training using boxes, medicine balls, and ladders - to increase the stretch shortening cycle efficiency of the athletes. A series of paired samples t-tests were used to analyze pre- and post-camp performance data.

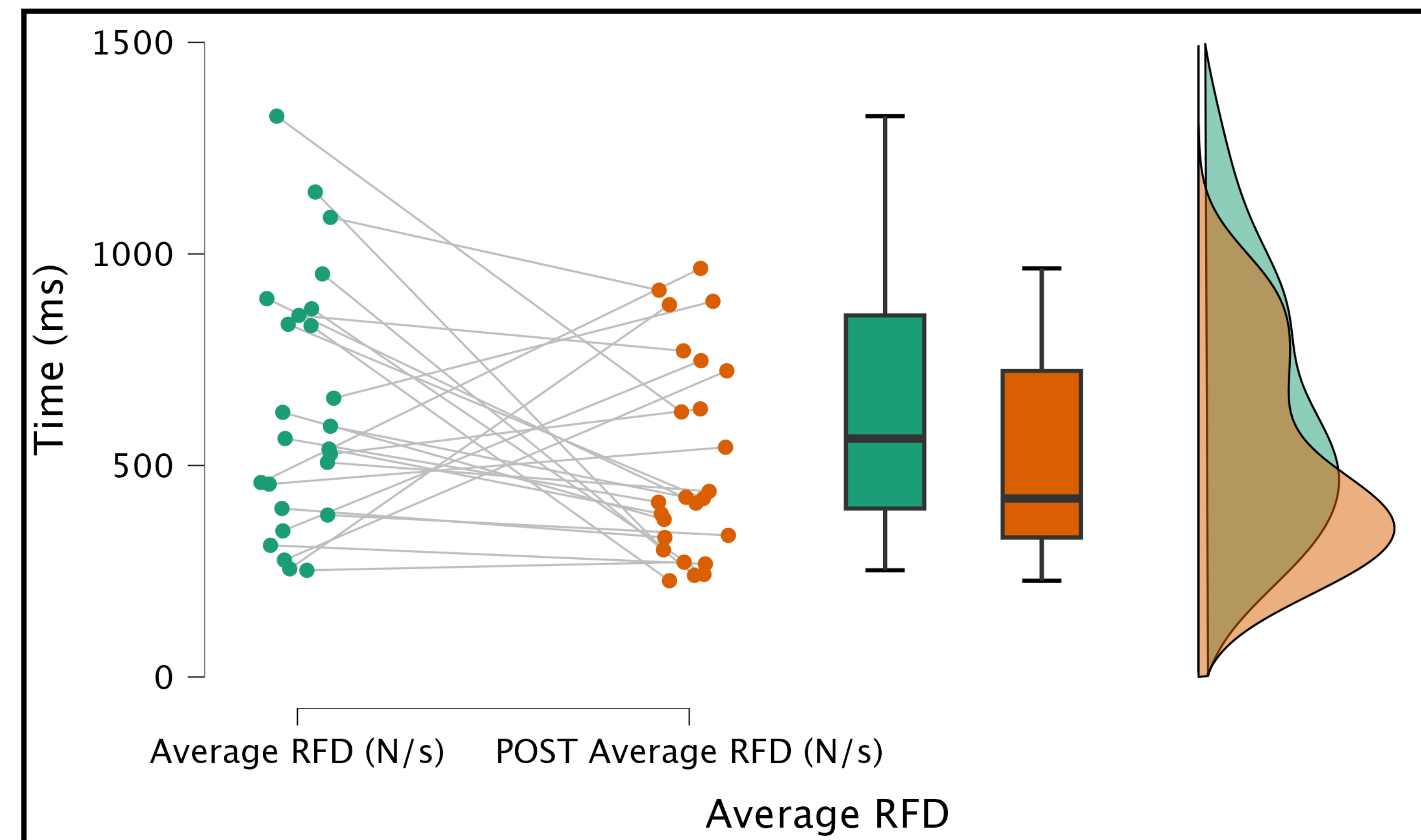


Figure 1. Changes in average RFD

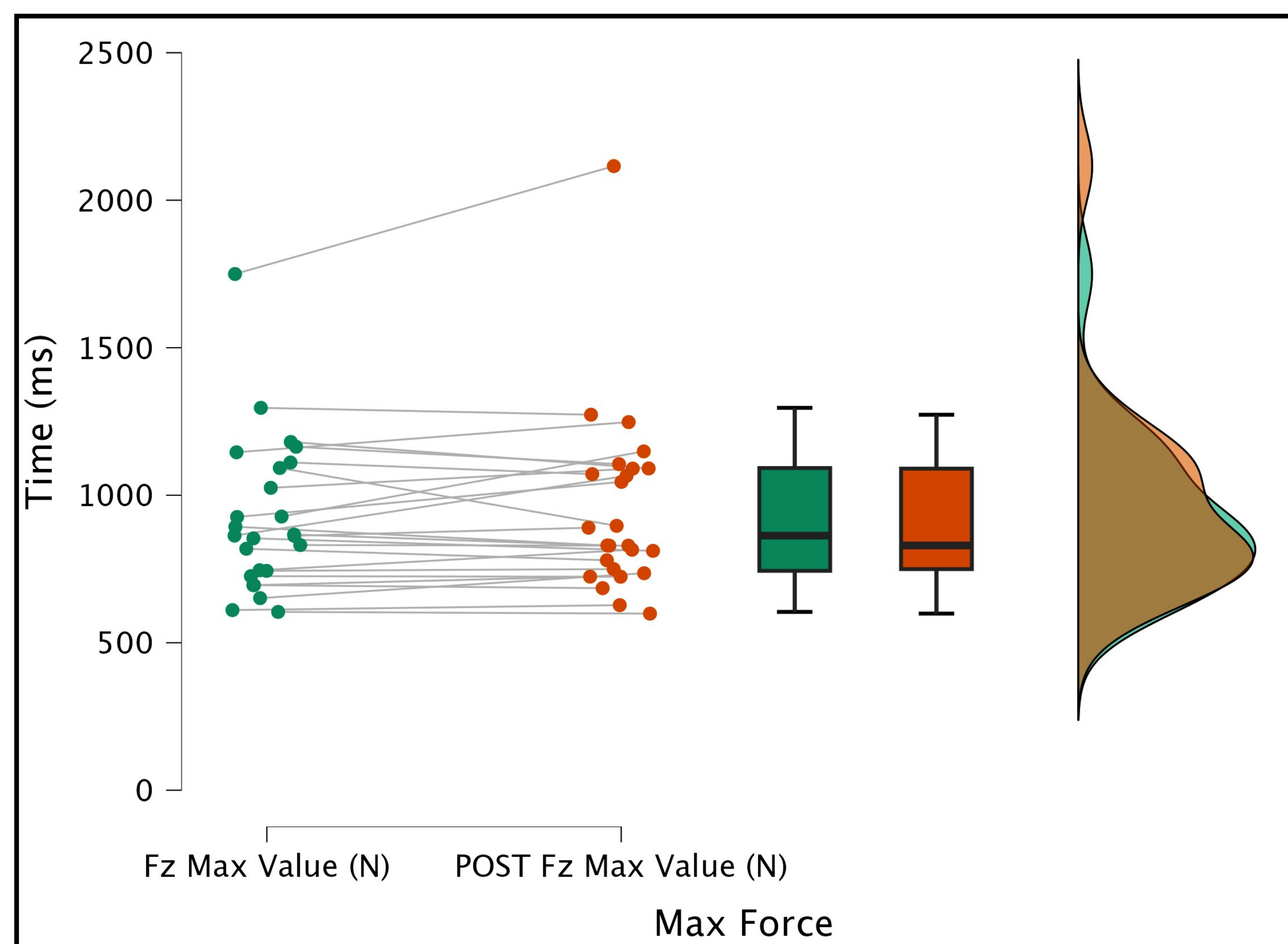


Figure 2. Changes in maximal vertical force

Results

Maximal force production displayed a non-significant change for pre- to post-testing (Mean Diff: 27.96 Newtons; $p = 0.229$; Cohen's $d = -0.247$) (see Figure 1). The average RFD displayed a non-significant change from pre- to post-testing (Mean Diff: -126.82 N/s; $p = 0.121$; Cohen's $d = 0.321$) (see Figure 2). Additionally, RFD from 0-0.1ms, 0-0.2ms, and 0-0.3ms showed a non-significant change from pre- to post-testing (Mean Diff: -270.77 N/s; $p = 0.330$; Cohen's $d = 0.199$), (Mean Diff: -61.80 N/s; $p = 0.727$; Cohen's $d = 0.071$), (Mean Diff: -45.27; $p = 0.589$; Cohen's $d = 0.109$), respectively. All other metrics also displayed non-significant results.

Conclusion

One week of a general speed and agility training did not substantially alter IMTP performance in youth athletes.

Practical Application

Study findings suggest that five days of consecutive speed and agility training may be insufficient to produce measurable improvements in IMTP performance in youth athletes. Coaches may need to implement longer or more targeted training programs to elicit significant improvements in these areas.



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Full Abstract

