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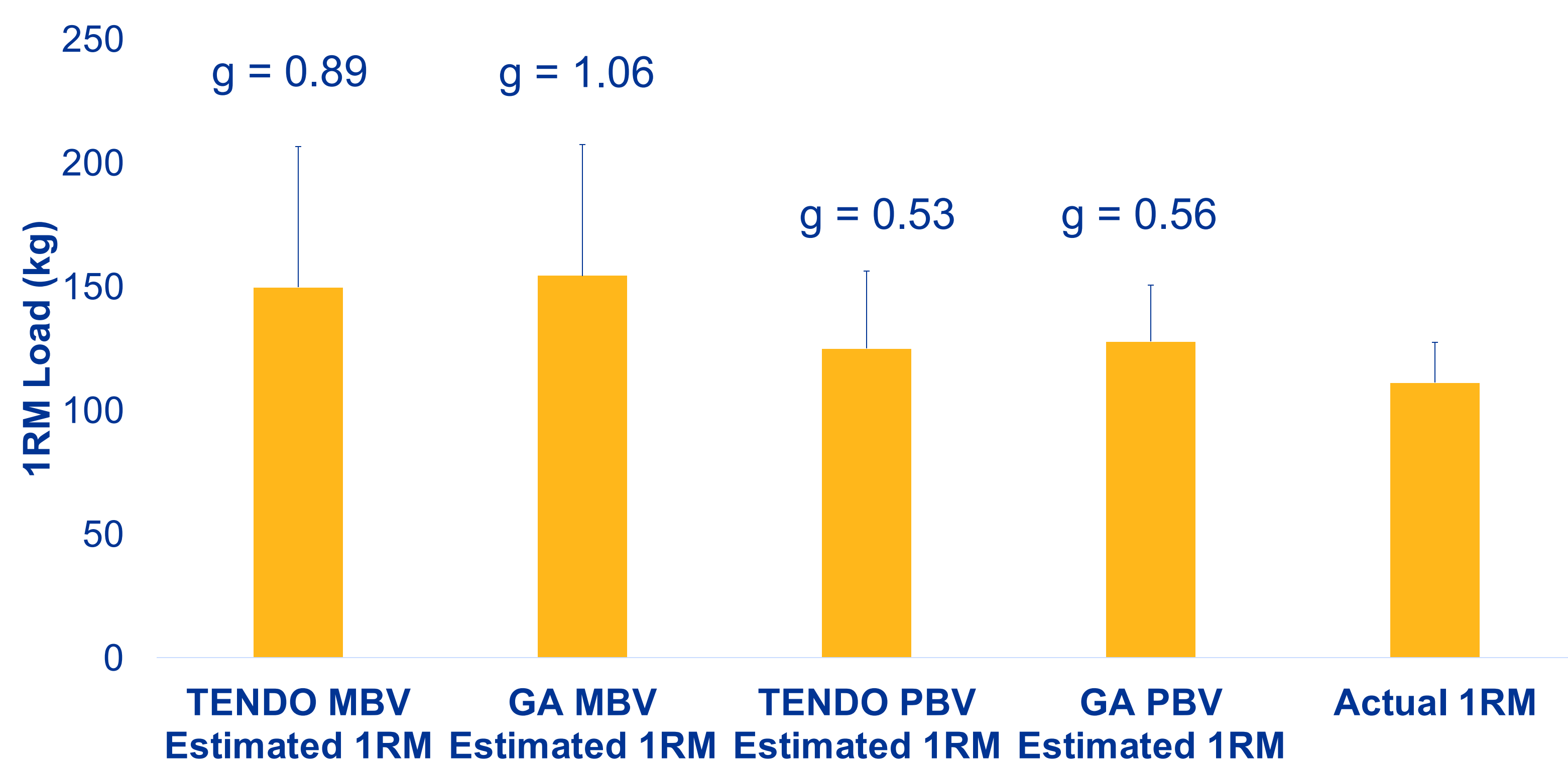
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## INTRODUCTION

Linear position transducers (LPT) are transforming the weight room, allowing coaches to monitor neuromuscular fatigue, daily readiness, and individualize training programs and loads through real-time barbell displacement and velocity tracking (5). Integrating these devices into a performance setting provides valuable insight into athlete development and offers immediate feedback that supports coaching adaptations. The usefulness of LPTs is dependent on validity, reliability, and practical use, including accurate set-up and training integration (2,3). For effective load management and athlete monitoring, LPT must produce accurate measurements, especially when estimating one-repetition maximum (1RM) values (1). This is critical for high-velocity, explosive lifts such as the hang power clean (HPC), where inaccurate estimations could lead to improper loading, increased injury risk, or training stagnation (4). Current literature supports the use of LPT with dynamic exercises, such as the back squat and bench press, in a progressive training context, but fails to include information regarding explosive lifts. Additionally, there is limited research on comparing different devices under identical conditions (2,5).

**Purpose:** To compare the estimated 1RM HPC from two different linear position transducers and the actual 1RM.

## RESULTS



**Figure 1.** Estimated vs. actual 1RM for the hang power clean using mean barbell velocity (MBV) and peak barbell velocity (PBV) from the TENDO and GymAware.



## METHODS



**Figure 2.** TENDO and GymAware setup for the HPC 1RM.

## CONCLUSIONS

- There were no statistical differences between estimated 1RM from two different linear position transducers and actual 1RM during the HPC; however, moderate and small effect sizes were present between measurements, respectively.
- The greatest variation in 1RM was displayed by both linear position transducers within the MBV estimations although PBV estimations also displayed greater variation compared to the actual 1RM.

## PRACTICAL APPLICATIONS

- Strength and conditioning practitioners should exercise caution when using MBV and PBV load-velocity profiles generated from linear position transducers to estimate the 1RM HPC in resistance-trained men as considerable variation may prevent accurate load assessment and prescription as well as the ability to monitor maximal strength progression.

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