USING THE LOAD-VELOCITY RELATIONSHIP FOR 1RM PREDICTION

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ABSTRACT

Jidovtseff, B, Harris, NK, Crielaard, J-M, and Cronin, JB. Using the load-velocity relationship for 1 RM prediction. *J Strength Cond Res* 24(x): 000-000, 2009-The purpose of this study was to investigate the ability of the load-velocity relationship to accurately predict a bench press 1 repetition maximum (1 RM). Data from 3 different bench press studies ($n = 112$) that incorporated both 1 RM assessment and submaximal load-velocity profiling were analyzed. Individual regression analysis was performed to determine the theoretical load at zero velocity (LD0). Data from each of the 3 studies were analyzed separately and also presented as overall group mean. Thereafter, correlation analysis provided quantification of the relationships between 1 RM and LD0. Practically perfect correlations ($r = -0.95$) were observed in our samples, confirming the ability of the load-velocity profile to accurately predict bench press 1 RM.

KEYWORDS : maximal strength ; isoinertial ; estimation

INTRODUCTION

Determination of an individual's maximal strength or 1 repetition maximum (1RM) is considered by some authors to be problematic for populations such as the young (18) and the aged (23). As a result, different authors have reported methods that allow the estimation of 1RM from performing submaximal repetitions to failure (1,4,13,21,22). The repetitions to failure method has been widely investigated, the consensus being that the accuracy of these estimations depends on several parameters such as the number of repetitions, type of exercise, training background, and population used (3,5,8,13,21). However, all these methods are based on the force-endurance relationship and no author to our knowledge has proposed estimation of 1RM from the load-velocity relationship. Given the increasing use of dynamometers such as accelerometers and/or linear position transducers, it may be that maximal strength can be predicted from the load-velocity relationship within individuals. The aim of this study was to first examine the relationship between 1RM and the load-velocity profile and subsequently determine 1RM prediction equations from that profile.

METHODS

Experimental Approach to the Problem

Theoretically, the load-velocity relationship could be used to estimate maximal strength such as 1RM. The data of 3 studies that determined both the 1RM and load-velocity relationship for the bench press were used for analysis. The measurement of average velocity (AV) at 3 or 4 increasing loads in these studies determined, for each subject, the best fit regression line and associated parameters such as slope and intercept point on the Y axis that could be used for 1RM estimation.

Subjects

A total of 112 subjects (90 males, 22 females) from 3 previous studies (14,15,17) were involved in this analysis. Table 1 summarizes the subject characteristics. All subjects were involved in recreational activities and were free from any injuries at the time of each investigation. Study protocols were approved by the University of Liege Ethical Committee, and all subjects signed an informed consent form prior to each study.

1rm Prediction And Load Velocity Relationship

AN Whitehead

1rm Prediction And Load Velocity Relationship:

Unveiling the Power of Verbal Beauty: An Emotional Sojourn through **1rm Prediction And Load Velocity Relationship**

In a world inundated with screens and the cacophony of instant conversation, the profound energy and mental resonance of verbal art usually diminish in to obscurity, eclipsed by the continuous barrage of sound and distractions. Yet, set within the lyrical pages of **1rm Prediction And Load Velocity Relationship**, a charming function of literary brilliance that impulses with natural feelings, lies an wonderful trip waiting to be embarked upon. Penned by a virtuoso wordsmith, this interesting opus instructions readers on a mental odyssey, delicately revealing the latent possible and profound influence stuck within the intricate web of language. Within the heart-wrenching expanse with this evocative analysis, we can embark upon an introspective exploration of the book is key styles, dissect their fascinating writing design, and immerse ourselves in the indelible impact it leaves upon the depths of readers souls.

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