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A comparison between a traditionally periodised programme and a load autoregulated periodised programme for maximal strength gain in the squat, bench press, and deadlift in weight-trained males

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Abstract

Background: Training towards the goal of improving maximal strength is commonly undertaken; particularly by athletes involved in contact sports, powerlifters, and recreational body builders. Multiple methods of programming exist, with autoregulated (AR) training being a popular topic within the training community. AR training involves day to day fluctuations in volume and/or intensity in order to accommodate the athlete's performance on a given day. This could potentially allow for greater gains in strength due to fine tuning of the fatigue -fitness interaction. However, scant research exists on AR training, with the vast majority being carried out on individuals during rehabilitation therapy.

Aim: To examine whether a load-autoregulated strength training programme is more effective in improving maximal strength in the squat, bench press, and dead lift than a traditionally periodised program, in experienced weight-trained individuals.

Methods: Eight healthy, recreationally trained males agreed to participate and completed this study. Each participant completed a traditionally (TD) programme and an AR programme in a randomised, cross-over design with a 2-week wash out period between. Each programme involved baseline one-repetition-maximum testing (1RM) in the barbell squat, bench press, and deadlift followed by eight weeks of training with subsequent 1RM testing. Following warm up, participants completed one set of as many repetitions as possible (AMRAP) at 85% of baseline 1RM, followed by subsequent working sets. 1RM Prediction equations were utilised in the AR training group to dictate load used in the working sets; whereas the TD groups subsequent sets were based on baseline 1RM.

Results: The squat, deadlift, and total improved significantly within each programme (all $p<0.05$), however no differences between programmes were present (all $p>0.05$). Bench press strength improvement was significantly greater in the TD programme (time x programme interaction $p<0.05$).

Conclusions: The present study found no differences in effectiveness of programmes at producing strength gain in the squat, deadlift, or total weight lifted. However the TD programme resulted in a greater improvement in bench press strength compared to AR. Future research would also involve auto-regulated volume, as well as ensuring matched cross over design, and ideally a use of more trained participants.

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Abbreviations

A

AR	Autoregulated
AKT	Protein kinase B
AMRAP	As many repetitions as possible

B

BP	Block periodisation
B1	Baseline testing one
B2	Baseline testing two

C

CNS	Central nervous system
CSA	Cross sectional area

D

DUP	Daily undulating periodisation

E

EIMD	Exercise-induced muscle damage
EMG	Electromyography
ES	Effect size

F

FP	Foot position
F1	Final testing one
F2	Final testing two

G

g	Gravitational acceleration

H

HR	Heart rate

K

kg	Kilograms

L

LP	Linear periodisation
M	
mTOR	Mammalian target of rapamycin
N	
NP	Non-periodised
R	
RIR	Repetitions in reserve
RLP	Reverse linear periodisation
RPE	Rating of perceived exertion
T	
TD	Traditionally periodised programme
U	
UP	Undulating periodisation
W	
WUP	Weekly undulating periodisation
W1T1	Week one trial one
W8T1	Week eight trial one
#	
1RM	One repetition maximum
3x10	3 sets of 10 repetitions per set

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