INPLASY

The effects of blood flow restriction training on PAP and lower limb muscle activation: a meta-analysis

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ADMINISTRATIVE INFORMATION

INTRODUCTION

Review question / Objective This study aims to systematically evaluate the effects of blood flow Q9 restriction (BFR) training on lower limb muscle activation and post-activation potentiation (PAP) in athletes through a meta-analysis and discuss methods to improve instant muscle strength so as to provide a reference for training in this field: Randomized controlled trials (RCTs) that examined the impact of BFR training on muscle activation and PAP were gathered through database searches.

Condition being studied the effects of blood flow Q9 restriction (BFR) training on lower limb muscle activation and post-activation potentiation (PAP) in athletes.

METHODS

Participant or population The study subjects included healthy adults, both with and without prior training experience.

Intervention The experimental group received BFR training.

Comparator The control group received either other trainingmodalities or no training at all.

Study designs to be included Unclear research type: Studies lacking clear documentation of their research type were excluded. Non–BFR training: Studies that involved interventions other than BFR training were excluded.Duplicate publications: Repeatedly published articles for which full text could not be obtained and review articles were

excluded. Lack of quantitative outcome data: Studies without quantitative outcome indicators or valid data were excluded. Animal experiments: Research that involved animal experiments were excluded.

Eligibility criteria Type of study: All included literature were publicly publishedand involved randomized controlled trials (RCTs) that studied theeffects of BFR training on muscle activation and post-activation enhancement effects. Study subjects: The study subjects included healthy adults, both with and without prior training experience.Interventions: The experimental group received BFR training, while the control group received either other training modalities or no training at all. Outcome measures: The primary outcome measure was related to the quantitative lower limb (below the point of the iliac crest) (Zhao et al., 2006), which included measures of muscle activation and PAP such as MVCmoment, EMG value, and longitudinal jump height. Additional criteria: The studies should provide details about the experimental design and intensity of BFR training, among other relevant information. Source inclusion: To minimize the risk of bias in the included literature, this study considers only articles indexed in the SCI (Science Citation Index).

Information sources CNKI, Wanfang, VIP, PubMed, and Web of Science databases.

Main outcome(s) BFR training can induce lower extremity muscle activation and PAP. Combining self-weight training with BFR exercises set at 40%–60% AOP appears to be particularly effective in inducing PAP, especially for enhancing CMJ. Furthermore, combining body-weight training with BFR is considered an effective warm-up method to improve CMJ.

Quality assessment / Risk of bias analysis To minimize the risk of bias in the included literature, this study considers only articles indexed in the SCI (Science Citation Index).

Strategy of data synthesis The homogeneity test (Q test, test level a = 0.1) was used to test for heterogeneity, and I 2 values from 0% to 100%, I 2 > 50%, and P < a indicated the existence of heterogeneity, and the random effects model was selected. The random effects model was chosen for meta-analysis, while the fixed effects model was chosen for the opposite.

Subgroup analysis Not reported.

Sensitivity analysis Sensitivity analysis was conducted on the included literature, both by including and excluding individual groups of studies, to assess heterogeneity.

Country(ies) involved China.

Keywords blood flow restriction training, muscle activation, post-activation potentiation, meta-Q12analysis, lower limb muscle.

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