

Effect of Blood Flow Restriction Training Combined with Sprint-specific Plyometrics on Strength, Endurance, and Agility in Semi-professional Football Players: A Pilot Study

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ABSTRACT

Introduction: Football is a high-intensity intermittent sport that involves repeated sprinting, jumping, rapid acceleration, and frequent changes in direction. These demands often lead to muscular fatigue, reduced performance, and delayed recovery. Blood Flow Restriction Training (BFRT) enables low-load exercise to produce physiological adaptations similar to high-intensity training by creating a hypoxic muscular environment. Sprint-specific plyometric drills further enhance neuromuscular coordination and explosive performance. However, limited evidence exists regarding the combined effect of BFRT with sprint-specific plyometric training on functional performance in football players.

Aim: To evaluate the effects of BFRT combined with sprint-specific plyometrics on strength, endurance, and agility in semi-professional football players through a 4-week study.

Materials and Methods: Ten male semi-professional football players aged 18-30 years were randomly assigned to the control group (n=5) and the experimental group (n=5). Both groups trained three times per week for four weeks. The control group performed sprint-specific plyometric drills with SHAM BFRT, while the experimental group performed BFRT combined with sprint-specific plyometric drills. Outcome measures included vertical jump height,

the Illinois agility test, and the wall sit endurance test. Pre- and post-intervention data were analysed and presented as mean±SD.

Results: Baseline values were comparable between the groups. After four weeks, the experimental group demonstrated greater improvements across all outcome measures compared to the control group. Vertical jump height increased from 149.6±2.1 to 151.0±1.6 cm in the control group and from 158.8±2.6 to 168.8±2.6 cm in the experimental group. Illinois Agility Test performance improved from 20.26±0.24 to 20.04±0.19 s in the control group and from 19.30±0.22 to 18.30±0.22 s in the experimental group. Wall-sit endurance increased from 300.0±7.9 to 310.0±7.9 s in the control group and from 332.4±5.6 to 375.0±7.9 s in the experimental group. No adverse events were reported during the intervention period.

Conclusion: The findings of this pilot study suggest that combining BFRT with sprint-specific plyometric drills may be a safe and effective low-load training strategy to improve strength, endurance, and agility in semi-professional football players. The observed improvements support the feasibility of this intervention and indicate the need for larger randomised controlled trials to confirm its effectiveness.

Keywords: Illinois agility test, Low-load exercise, Vertical jump height, Impact of blood flow, Restriction training on muscle fatigue, Strength and Running.

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