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Influence of medical shock waves on healthy muscle tissue.

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Introduction

Competitive sport requires each athlete to be at peak performance at all times. This is often a challenging task to manage, as overuse and fatigue syndromes often impede performance. For over a decade shockwave therapy (SWT) have been utilised successfully to manage sports injuries.¹ Our investigation aimed to determine the effects of SWT on muscle tissue of healthy subjects.

Methods

Four golfers and weightlifters were recruited for this project. Weightlifter baseline (BS) and post-intervention (PI) data was collected from activation patterns of six muscles over five repetitions of a 120kg loaded back-squat. Personal-best (PB) back-squat records of each weightlifter was noted and compared PI. Golfers hit 20 balls with a 7-iron and each swing speed, club-ball interface, and ball distance was measured utilising FlightScope®. 500 acoustic impulses were administered over selected muscles relevant to each sport over two sessions conducted at two week intervals utilising an electrohydraulic generator (OrthoGold-100). PI data was collected at week 8.

Result

Golf - increases in both swing speed and ball distance was noted in each golfer with the mean average (MA) recorded as being: Swing-speed (BS: 140.21km/h – PI: 147.12km/h), club-ball interface (BS: 1.32m/sec – PI: 1.46m/sec), Ball distance (BS: 143.25m – PI: 167.4m). Weightlifting – sEMG activation patterns recorded the following averages over six different muscles throughout each back-squat (BS: 1588.08üv/back-squat – PI: 1322.87üv/back-squat). PB back-squat score avg. (BS: 340kgs – PI: 401kgs).

Discussion

Our observations utilising sport specific measurements suggests that SWT had a positive influence on muscle output and performance. Although an overall improvement in performance was observed in both sporting disciplines and in each athlete, but of note was the reduced muscle expenditure required to complete a similar task PI, as observed in weightlifting. From what that has been presently

elucidated of the positive mechanotransductive impact of SWT on human tissue¹. It is plausible to suggest that SWT modulates a favourable biocellular and molecular response in muscle tissue,¹ offering the potential to reduce, even prevent overuse syndromes in sports. This case report has its limitations (eg. small sample size) however the observations are encouraging and opens new possibilities in sports science and medicine, inviting further investigation and collaboration in this area.

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Reference

1. d'Agostino CM, Craig K, Tibalt E & Respizzi S. Shock wave as biological therapeutic tool: From mechanical stimulation to recovery and healing, through mechanotransduction. *Int J Surg.* 2015; 24(Pt B):147-153.