Influence of medical shock waves on healthy muscle tissue.

Conference Paper - July 2016
DOI: 10.13140/RG.2.1.3884.3820

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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\textsuperscript{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\textsuperscript{®}. 500 acoustic impulses were administered over selected muscles relevant to each sport over two session conducted at two week intervals utilising an electrohydraulic generator (OrthoGold-100). PI data was collected at week8.

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 tissue\textsuperscript{1}. It is plausible to suggest that SWT modulates a favourable biocellular and molecular response in muscle tissue,\textsuperscript{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