

# The Evaluation of Shoulder Muscle Fatigue in Volleyball Players

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## Abstract

**Objective:** To identify the difference in infraspinatus, posterior deltoid, and teres minor muscle fatigability between the dominant and non-dominant side in elite volleyball players and to examine the differences between three sEMG signal processing methods used in assessment of shoulder muscle imbalance due to fatigue in volleyball players.

**Methods:** In 18 male volleyball players (21-26 years;  $186.6 \pm 8.4$  cm;  $85.7 \pm 9.8$  kg) with no previous shoulder injury the bioelectrical activity of the right and left infraspinatus, posterior deltoid, and teres minor muscles was measured during 60 seconds of isometric contraction in prone position with the shoulder in external rotation. Fatigue related changes as mean frequency shift were calculated from the RAW sEMG signal using 3 processing methods: FFT (Fast Fourier Transform), STFT (Short Time Fourier Transform) and CWT (Morlet Continuous Wavelet Transform).

## Results:

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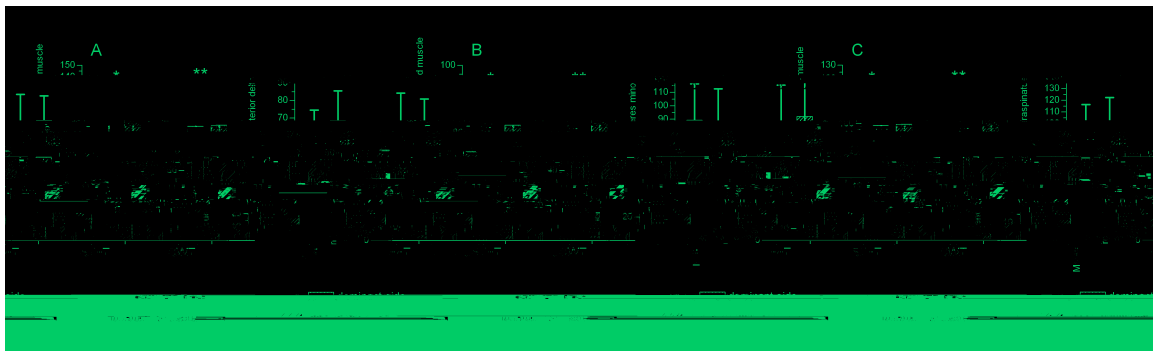
differences

## Materials and Methods

### Participants



T e  
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signif cantly dif erent



T e  
signif cantly dif erent  
signif cantly dif erent



T e  
dif erence

Discussion

T e signif cant dif erences

T e



T e

