Abstract #617

Muscular activity monitoring with an artificial intelligence-based wearable sensor in facioscapulohumeral muscular dystrophy: A pilot study

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Introduction. As the field anticipates more facioscapulohumeral muscular dystrophy (FSHD) clinical trials, there is an acute need for reliable/quantitative clinical outcome measurements to monitor FSHD.

Objectives. To assess an innovative clinical outcome assessment using an artificial intelligence (A.I.)-based wearable device for tracking shoulder joint kinematics and muscle activity in FSHD subjects.

Methods. A flexible experimental wireless apparatus comprising a triaxial accelerometer and four surface electromyography sensors (over bilateral trapezius, infraspinatus, biceps, and deltoid muscle regions) was employed on 4 adult FSHD and 4 healthy control subjects.

Results. The device reliably showed range of motion (ROM) measures in all activities tested (shoulder abduction, elbow flexion, shoulder external and internal rotations) with 3 trials in each performance. There was also a significant difference between the detected ROM and muscular activity between control and FSHD subjects ($P<0.05$).

Conclusions. Our pilot data demonstrated a potential utility of an A.I.-based wearable sensor in monitoring FSHD.

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