CO19-004-e
Scapulothoracic kinematics in children: Accuracy and reliability
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Modified 3D scapular kinematic patterns for two activities of daily living in painful shoulders with restricted mobility: A comparison with contralateral unaffected shoulders
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Introduction.— There is a lack of studies of the 3D scapular kinematic patterns for patients with shoulder pathologies during self-care activities of daily living (ADL).
Objective.— This study aimed to compare 3D scapular kinematic patterns of both shoulders (affected and contralateral non-affected) in patients with unilateral shoulder pathology as they performed two ADL: hair combing and back washing, with use of an electromagnetic device (Polhemus Fastrack®).
Methods.— Forty-eight patients: 11 with glenohumeral osteoarthritis (GHOA), 20 with frozen shoulder (FS) and 17 with rotator cuff tendinopathies (RCT) were recorded. 3D scapular rotations of the affected and contralateral nonaffected shoulders were compared for each pathology group at rest and at the humerothoracic elevation (HTE) used to perform the ADL: 30°, 45° and 60° of HTE for hair combing, and 30° of HTE elevation for back washing.
Results.— All patients were able to achieve both ADL with both shoulders, yet, the HTE used to achieve the ADL was significantly decreased in pathological shoulders. For hair combing, mean scapular lateral rotation was significantly greater at each HTE degree for GHOA and RCT groups and mean scapular posterior tilt was significantly lower at 30° of HTE for the FS group. For back washing the mean scapular medial rotation was significantly lower at 30° of HTE for the RCT group.
Conclusion.— There are specific 3D scapular kinematic patterns related to the shoulder pathology. Specific scapular kinematic patterns must be considered for appropriate therapeutic management.
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A simple method to compare body and upper limb kinetics in the course of pointing task
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Effect of wrist stabilization on global upper arm kinematics
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Material and methods.— Two controls and six chronic hemiparetic patients (mean age: 51 years; delay post-injury: 7.5 years) underwent kinetic analysis of reaching movements of the upper arm, with and without wrist stabilization by an orthosis. Pointing tasks were conducted in three different directions of the peripersonal space of participants. Kinematic features were recorded through four Polhemus sensors attached to the arm (Fastrack®).
Results.— Comparing the two conditions, four of the six patients increased length of the trajectory and peak hand velocity of the reaching phase of the movement when they performed the task with a stabilized wrist. In the same way, shoulder–elbow synergies (as expressed by the relation between shoulder flexion-extension and elbow flexion-extension) were enhanced by wrist stabilization. The two other patients and the controls had the same results in both conditions.
Discussion.— Wrist stabilization is strongly suspected to enhance proximal kinematic of the upper arm during reaching after lesion of the central nervous system, probably through simplification of the poly-articular chain of the arm. These very preliminary results have to be confirmed. It may lead to changes in our rehabilitation and surgical procedures.
Reference
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