Oral Communication

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Device-Assisted Rehabilitation in Adhesive Capsulitis: A New Era of Treatment

Topic: Robotics

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BACKGROUND

Adhesive Capsulitis (AC), commonly known as frozen shoulder is characterized by progressive pain and stiffness across the three planes of movement, leading to significant functional limitations and reduced quality of life. Despite its prevalence, its pathophysiology remains poorly understood, and treatment options are diverse. This study aims to evaluate the effectiveness of mechanically assisted rehabilitation using continuous passive motion (CPM) and exoskeleton -assisted therapy compared to conventional mobilization in patients with AC.

METHODS

A randomized controlled trial was conducted (Clinicaltrials.gov registration: NCT06766448). Inclusion criteria were patient over 18 years old diagnosed with idiopathic AC or capsulitis associated with diabetes, dysthyroidism or dislipidemia. Exclusion criteria were cognitive impairments, prior shoulder surgery, rotator cuff pathology, neurological or inflammatory diseases, and recent hydrodilatation (within six months before enrollment).

A total sample size of 35 patients per group was determined. Participants were randomized into two groups:

- Intervention group (A): underwent, twelve (12) sessions of continuous passive motion (CPM) and 12 sessions of Armeo®Spring assisted therapy.
- Control group (B): received twenty-four (24) sessions of conventional rehabilitation therapy.

Outcomes were Shoulder Pain and Disability Index (SPADI), shoulder range of motion (ROM) and the Visual Analog Scale (VAS) for pain assessment.

RESULTS

To date, sixteen (16) patients have been recruited in each group. Baseline demographic analysis showed a predominance of female participants, with a median age of 53 years [49.0 ;59.0] in group A and 54 years [59.0; 65.0] in group B. Most participants were right-handed and non-diabetic. No statistically significant difference was found between the groups for these baseline characteristics ($p < 0.05$).

Comparison of median SPADI and VAS scores between the two groups revealed no statistically significant difference. However, a significant difference was observed in passive and active ROM, with the intervention group exhibiting lower median values, indicating greater movement restriction. Changes in SPADI scores (pain, disability, and total) from baseline to six weeks, and from baseline to three months were not significantly different between the two groups.

CONCLUSION

Rehabilitation remains a cornerstone of AC management. While Instrument-assisted rehabilitation could be a promising approach, its benefits require further validation. The small sample size may have influenced the results, highlighting the need for larger-scale studies to assess the efficacy and patient acceptability of robotic rehabilitation for AC.

Statement of Disclosures

None

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