

Mobilization Techniques for the Hemiplegic Shoulder in Subacute Stroke Patients with Severe Arm Impairment.

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Purpose: To compare the effect of different mobilization techniques for the hemiplegic shoulder on shoulder passive range of motion (PROM).

Methods: 11 subacute (first) stroke patients with upper limb impairment, were recruited in the Rehabilitation Center of the Ghent University Hospital. Three different mobilization techniques for the hemiplegic shoulder were applied in randomized order: (1) a combined soft-tissue mobilization in the scapular plane, (2) a scapular mobilization without glenohumeral movement and (3) an angular mobilization in the frontal plane. All techniques were applied for four weeks. Primary (PROM shoulder) and secondary (Shoulder pain, Fugl-Meyer assessment upper extremity part, Trunk Impairment Scale, Modified Ashworth Scale for spasticity) outcome measures were assessed before intervention (0 weeks) and after 4, 8 and 12 weeks.

Results: After technique 1 (combined) patients showed an increased PROM for external shoulder rotation (+ 6.82°; p=0.006) compared to the other 2 techniques (scapular mobilization -7.27°; angular mobilization -5.45°). Although no other significant differences could be detected for other outcome measures patients did not show a decrease of PROM for shoulder abduction after technique 1 (+ 0.45°; p=0.057) compared to technique 2 (-8.18°) and 3 (-6.82°).

	Technique 1	Technique 2	Technique 3	p
PROM flexion (°)	-0.45 (±9.86)	-5.91 (±22.00)	-9.55 (±25.64)	0.663
PROM abduction (°)	0.45 (±5.22)	-8.18 (±12.30)	-6.82 (±13.09)	0.057
PROM external rotation (°)	6.82 (±9.20)	-7.27 (±10.81)	-5.45 (±11.72)	0.006*
VAS rest	0.73 (±2.01)	0.18 (±0.75)	0 (±0.89)	0.819
VAS activities	-1.18 (±2.23)	1 (±3.55)	-0.64 (±2.62)	0.539
VAS night	0.18 (±0.60)	0 (±0)	-0.73 (±1.85)	0.156
MAS shoulder retroflexors	1.36 (±0.32)	-0.23 (±0.82)	0.32 (±0.56)	0.250
MAS shoulder adductors	-0.23 (±0.41)	-0.09 (±0.30)	0.00 (±0.45)	0.424
MAS shoulder internal rotators	-0.14 (±0.74)	0.09 (±0.66)	0.09 (±0.30)	0.519
MAS elbow flexors	0.00 (±0.39)	-0.05 (±0.47)	0.00 (±0.67)	0.908
TIS	2.64 (±4.72)	1.27 (±1.42)	1.36 (±1.57)	0.562
FMUE	1.82 (±4.4)	1.45 (±1.64)	1.64 (±2.06)	0.916

PROM = passive range of motion; secondary outcome measures; VAS = Visual Analogue Scale; MAS = Modified Ashworth Scale; TIS = Trunk Impairment Scale; FMUE = Fugl-Meyer assessment upper extremity part; *p<0.05

Table 1: Average (±SD) change in primary and secondary outcome parameters for each intervention.

Conclusions: Using the combined soft-tissue mobilization in this study population results in an increased PROM for external shoulder rotation, whereas after the other interventions a decrease of passive external rotation was noticed. Since external rotation is an essential biomechanical component in the prevention of shoulder pain, this technique can be recommended for that matter.