

EFFECTIVENESS OF GLOBAL POSTURAL REEDUCATION COMPARED TO SEGMENTAL EXERCISES ON FUNCTION, PAIN, AND QUALITY OF LIFE OF PATIENTS WITH SCAPULAR DYSKINESIS ASSOCIATED WITH NECK PAIN: A PRELIMINARY CLINICAL TRIAL

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ABSTRACT

Objective: The purpose of this study was to assess the effectiveness of global postural reeducation (GPR) relative to segmental exercises (SE) in the treatment of scapular dyskinesia (SD) associated with neck pain.

Methods: Participants with SD and neck pain (n = 30) aged 18 to 65 years were randomly assigned to one of two groups: GPR and SE (stretching exercises). The upper extremity was assessed using the Disabilities of the Arm, Shoulder, and Hand questionnaire; function of the neck was estimated using the Neck Disability Index; pain severity was measured using a visual analogical scale; and health-related quality of life was assessed using the Short Form-12. Assessments were conducted at baseline and after 10 weekly sessions (60 minutes each). The significance level adopted was $\alpha < .05$.

Results: For pre-post treatment comparisons, GPR was significantly associated with improvements in function of neck and upper extremities, pain, and physical and mental domains of quality of life ($P < .05$). Segmental exercises improved function of upper extremities and of the neck and severity of pain ($P < .05$). When contrasting groups, GPR was significantly superior to SE in improving pain and physical domains of the quality of life.

Conclusion: This study showed that GPR and SE had similar effects on function of the neck and upper extremity in patients with SD associated with neck pain. When comparing groups, GPR was superior to SE in improving pain and quality of life. (J Manipulative Physiol Ther 2014;xx:1-7)

Key Indexing Terms: *Physical Therapy Modalities; Posture; Muscle Stretching Exercises; Dyskinesias; Neck pain*

Scapular dyskinesia (SD) is an alteration in the normal position or motion of the scapula during coupled scapulohumeral movements.¹ It is a broad term that clinically describes the lack of control of static or dynamic

positioning of the scapula relative to the thorax.² It affects from 64% to 100% of patients with shoulder lesions.³ Scapular dyskinesia is a major etiological factor in overhead athletes shoulder problems and is prevalent during swimming training in 82% of pain-free swimmers.⁴

Cervicalgia affects around 29% of men and 40% of women, and rates can be higher depending on age and activity level.^{5,6} The association of SD and neck pain has been well demonstrated in some studies.^{2,7-9} Patients with SD are also more likely to present pain in the shoulder and scapular region, in the paravertebral muscles,² and in the neck.^{8,9}

Global postural reeducation (GPR) and segmental exercises (SE) are well accepted as physical therapy techniques. In some countries, such as Brazil, France, Italy, and Spain, physical therapists have been using the GPR method, which is based on the recognition of 2 muscle chains divided into anterior and posterior chains,¹⁰ and focusing on the global stretching of antigravity muscles. All muscles of the same chain are simultaneously stretched during a 20-minute posture, avoiding compensations.¹¹ It assumes that retractions and stiffness of these muscles are associated with lack of postural

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balance and reperussion in several systems, often with rheumatologic, neurological, and respiratory symptoms.¹² Segmental exercises are static stretching exercises of conventional physical therapy, which consists of stretching a single muscle or small group of muscles up to a tolerable point and sustaining the position for a certain period, usually during 30 seconds.^{13,14} Several randomized clinical studies tested the effectiveness of GPR relative to other interventions (eg, static stretching) in conditions such as chronic neck pain, ankylosing spondylitis, and temporomandibular joint disorders,¹⁵⁻¹⁷ but not in SD associated with neck pain. For this reason, it is essential to study the effectiveness of GPR relative to SE (stretching exercises) in these patients.

Muscular changes (eg, on the superior trapezius and pectoralis) and postural abnormalities (kyphosis or lordosis) seem to be risk factors for SD and cervical pain.^{1,2} There are studies that show the effectiveness of SE in treatment of neck pain¹⁸ and SD,^{19,20} but few show the effectiveness of GPR in these patients. Thus, a study is needed to compare the effectiveness of GPR with SE of conventional physical therapy in patients with SD associated with cervical pain. Therefore, the aim of this study was to assess the effectiveness of GPR, relative to SE, in the treatment of SD with neck pain. This study particularly focused on the function of neck and arms, on pain, and on the quality of life.

METHODS

A preliminary randomized clinical study was performed. Randomization was conducted by randomly picking identical opaque envelopes with intervention assignment. Two groups were defined: GPR group (n = 18) stretched the anterior and posterior muscular chains, and SE group (n = 18) conducted stretching exercises. The time frame of this study was from July 2010 to February 2011.

Patients were referred to the study by a shoulder specialist (medical orthopedist) in the Faculty of Medical Sciences of Santa Casa of Misericórdia of São Paulo, São Paulo, Brazil. Inclusion criteria were as follows: SD as per the scapular malposition, inferior medial border prominence, coracoid pain and malposition, and dyskinesia of scapular movement (SICK) Scapula Rating Scale,² in association to chronic neck pain (pain for at least 3 months). Exclusion criteria included cervical stenosis, myelopathy, prolapsed intervertebral disk (as confirmed by magnetic resonance imaging), and/or winged scapula due to lesions of the long thoracic nerve or spinal accessory nerve, as documented by electromyography.

A total of 36 patients with SD and neck pain were included, with age ranging from 18 to 65 years. Of them, 30 completed the study (6 patients withdrew consent for work-related reasons). The flow of the study is described in

Figure 1. During the study, the patients did not receive other treatment modalities.

This study was approved by the Ethics Committee of Santa Casa de Misericórdia de São Paulo (Project no. 92/10). All participants signed informed consent forms. The clinical trial registration number is NCT01568840.

Outcome Measures

Function of the Upper Extremity. The upper extremity was assessed using the validated Portuguese version of the Disabilities of the Arm, Shoulder, and Hand questionnaire. The Disabilities of the Arm, Shoulder, and Hand questionnaire is a self-administered, region-specific outcome instrument developed as a measure of self-rated upper-extremity disability and symptoms. Items ask about difficulties while performing different physical activities due to arm, shoulder, or hand problem (21 items); the severity of spontaneous pain; activity-related pain; tingling; weakness and stiffness (5 items); as well as impact on social activities, work, sleep, and self-image (4 items). Each item has 5 response options. The scores for all items are then used to calculate a scale score ranging from 0 (no disability) to 100 (most severe disability).^{21,22}

Function of the Neck. Neck function was estimated using the Neck Disability Index (NDI), translated and adapted to Portuguese by Cook et al.²³ The NDI consists of 10 questions, with 6 possible responses (from 0 to 5), reflecting the burden of neck pain on pain, daily activities, work, reading, concentration, driving a car, sleeping, and leisure. Total NDI score ranges from 0 to 50; and based on the scores, the patients are categorized into the following: no disability (0-5), mild disability (6-14), moderate disability (15-24), severe disability (25-34), and totally disabled (35-50).²³⁻²⁵

Pain Severity. Pain severity was measured using a visual analogical scale, where a 10-cm scale without numbers is presented to patients. On the left extremity, the scale is labeled *no pain*; on the right extremity, it is labeled *maximum pain*. Patients marked on the line the severity of pain at the time of assessment.²⁶

Health-Related Quality of Life. Quality of life was assessed using the Short Form (SF)-12, the abbreviated version of the SF-36.²⁷ The SF-12 consists of 12 questions measuring physical and mental health. Time to complete the SF-12 is around 2 minutes. Score ranges from 0 to 100, and higher scores reflect better quality of life.²⁸

Assessments were taken at baseline and at 10 weeks and were identical at both time points. The therapist was trained in obtaining all assessments.

Interventions

Interventions for both groups were performed by the same physical therapist, who is a specialist in GPR technique and trained specifically for the application of

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