Physiotherapeutic intervention on pain and quality of life of systemic sclerosis elderly patients. Case reports

Intervenção fisioterapêutica na dor e na qualidade de vida em idosos com esclerose sistêmica. Relato de casos

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ABSTRACT

BACKGROUND AND OBJECTIVES: Systemic sclerosis is a chronic, multi-systemic and auto-immune disease, characterized by widespread angiopathy in small and microcirculation, Raynoud's phenomenon and skin and internal organs fibrosis. Physiotherapy is an effective alternative to fight musculoskeletal injuries caused by the disease. This study aimed at evaluating the effects of a physiotherapy program on pain and quality of life of two systemic sclerosis elderly patients.

CASE REPORTS: Longitudinal and interventionist case study. Participated in the study two elderly patients with systemic sclerosis, treated in the Physiotherapy Clinic, *Universidade de Passo Fundo/RS*. Patients were submitted to baseline evaluation made up of data collection (history and physical-functional evaluation) and application of the visual analog scale and of the Quality of Life Questionnaire – Medical Outcomes Study 36 – Item Short-Form Health Survey (SF-36) translated and validated to the Portuguese language. After baseline evaluation, elderly patients were submitted to a kinesiotherapy-based intervention program, with frequency of 2 weekly sessions and duration of 1h per session, in a total of 15 sessions. According to the visual analog scale, patients have improved pain and, according to SF-36, have improved quality of life.

CONCLUSION: Kinesiotherapy-based physiotherapeutic intervention protocol was an effective strategy to treat pain and improve quality of life of systemic sclerosis elderly patients.

Keywords: Elderly, Pain, Physiotherapy, Quality of life, Systemic scleroderma.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A esclerose sistêmica é uma doença crônica, multissistêmica e autoimune, caracterizada por angiopatia disseminada em pequena e microcirculação, fenômeno de Raynoud e fibrose cutânea e de órgãos internos. A fisioterapia tem se mostrado uma alternativa eficaz no combate aos agravos osteomioarticulares causados pela doença. O objetivo deste estudo foi verificar os efeitos de um programa de intervenção fisioterapêutica na dor e na qualidade de vida de dois idosos com esclerose sistêmica.

RELATOS DOS CASOS: Estudo longitudinal e intervencionista de natureza estudo de caso. Participaram do estudo dois idosos com esclerose sistêmica atendidos na Clínica de Fisioterapia da Universidade de Passo Fundo/RS. Os idosos foram submetidos a uma avaliação inicial que constituiu na coleta de dados (anamnese e exame físico-funcional) e na aplicação da escala analógica visual e do Questionário de Qualidade de Vida - *Medical Outcomes Study* 36 - Item *Short-Form Health Survey* (SF-36), traduzido e validado para o português. Após a avaliação inicial os idosos foram submetidos a um programa de intervenção baseado na cinesioterapia, com frequência de duas sessões semanais e duração de 1h por sessão, totalizando 15 sessões. De acordo com a escala analógica visual os pacientes apresentaram melhora no quadro álgico e de acordo com o SF-36 melhora na sua qualidade de vida.

CONCLUSÃO: O protocolo de intervenção fisioterapêutica baseado na cinesioterapia mostrou-se uma estratégia eficaz no tratamento da dor e na melhora da qualidade de vida em idosos portadores de esclerose sistêmica.

Descritores: Dor, Escleroderma sistêmico, Fisioterapia, Idoso, Qualidade de vida.

INTRODUCTION

In Brazil, elderly are those individuals aged 60 years or above[1]. Future projections indicate that until 2025 the elderly population, currently corresponding to 13% of total population, shall reach 32 million people in Brazil[2].

As Brazilians life expectation increases, there is also increased incidence of chronic diseases, responsible for increasing incapacity rates of the elderly[3]. Systemic sclerosis (SS) is more common among females[4] aged between 35 and 60 years[5]. It is a rare, chronic and autoimmune colagenosis[4] with very few exacerbation outbreaks[6]. Its etiology involves the immune

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system, and genetic, infectious and environmental factors, resulting in manifestations such as Raynaud phenomenon, ischemic ulcers, skin thickening and visceral complications[5], worsened by human aging[7].

SS epidemiology in Brazil is still not totally explained, however in the United States, its incidence is approximately 19 cases per one million inhabitants per year and its prevalence may vary from 19 to 75 cases per 100 million inhabitants per year[8].

Chronic pain is caused by tissue injuries (polyarthralgia and tendinitis)[9], impairing quality of life (QL) and daily life activities (DLA) of such individuals[10]. Physiotherapy prevents musculoskeletal disorders, improves functionality, mobility, cardiopulmonary conditioning and psychomotor skills[11]. Literature, however, lacks scientific evidences to support the addressed theme[5].

So, this study aimed at observing the effects of a physiotherapy intervention program on pain and QL of SS elderly patients.

CASE REPORTS

This is a longitudinal and interventionist case study, which is part of an umbrella project called "Effects of physiotherapy treatment on rheumatic disease patients", approved by the Human Research Ethics Committee, Universidade de Passo Fundo, under protocol 348381, as established by the Declaration of Helsinki.

Participated in the study two individuals: one female (patient A) 60 years old, single, three children with complete high school; and one male (patient B) 86 years old, widower, five children with complete high school and retired, both with medical diagnosis of SS and living in the city of Passo Fundo/RS.

Patients were submitted to 15 individual physiotherapy sessions, twice a week, lasting approximately 1h. Sessions were carried out from March to June 2015 in the Physiotherapy Clinic, School of Physical Education and Physiotherapy, Universidade de Passo Fundo, Passo Fundo/RS.

Pre-physiotherapy evaluation consisted of data collection (age, profession, physical evaluation and other relevant information), application of the visual analog scale (VAS) and of the Quality of Life Questionnaire – Medical Outcomes Study 36 – Item Short-Form Health Survey (SF-36) translated and validated to the Portuguese language. All data were collected as interviews, after previous explanation of the procedure and answering to participants' questions.

VAS is a one-dimension tool for pain intensity evaluation. It consists of a horizontal line with edges numbered from zero (no pain) to 10 (worst imaginable pain). Patient is requested to quantitatively indicate pain at that moment[12]. VAS may also classify pain as mild (zero to 2), moderate (3 to 7) and severe (8 to 10).

SF-36 is a QL evaluation questionnaire. It is a scale made up of 11 questions, involving domains such as functional capacity (10 items), physical aspects (4 items), pain (2 items), general health status (5 items), vitality (4 items), social aspects (2 items), emotional aspects (3 items) and mental health (5 items). Final score varies from zero (worst general health status) to 100 (best general health status)[13].

Patient A was diagnosed with SS 20 years ago, was under continuous drugs (3) and had family history of rheumatic disease. She had no comorbidities, such as hypertension, diabetes mellitus or cardiopathy (according to collected information). Her major complaint was hands and feet pain (level 5), in addition to swallowing difficulties. At physical evaluation she presented deformity, movement amplitude and hands and fingers mobility restriction, shortening and contracture of shoulder girdle. DLA (such as bathing, dressing, eating or cleaning) and gait were independent, although she reported some difficulty or discomfort when performing them.

Patient B was diagnosed with SS 7 years ago. He was under continuous drug (10) and had family history of rheumatic disease. He had no comorbidities, such as hypertension, diabetes mellitus or cardiopathy (according to collected information). His major complaint was swallowing difficulties and widespread pain, especially on knees (level 2). At physical evaluation, he presented deformities, movement amplitude and fingers mobility restriction, in addition to hands, shoulders, elbows, knees, wrists and ankles movement restriction. He had spinal mobility restriction in all regions and antalgic position. DLA (such as bathing, dressing, eating, cleaning) and gait were independent, although showing some difficulty or discomfort when performing them.

Physiotherapy intervention protocol was based on conventional kinesiotherapy, since this modality seems to be the most explored by current literature[5]. Exercises were performed as follows:

- Slow and sustained active-assisted or passive muscle stretching of major muscle groups of upper and lower limbs and of the trunk (15 seconds);
- Respiratory exercises with diaphragmatic pattern (3 cycles of 5 breaths);
- Strengthening of thigh adductor and abductor muscles with pink elastic band and progressing to blue and purple (3 series of 10 repetitions);
- Isometric strengthening of shoulder girdle in supine position (3 series of 10 repetitions with 3 seconds of contraction);
- Load transfer in upper limbs (3 series of 5 repetitions for each side);
- Pulmonary expansion exercises with a load-free bat (3 cycles of 5 repetitions);
- Waist dissociation in a 65cm Swiss Ball (3 series of 10 repetitions);
- Facial exercises (1 series of 10 repetitions for the exercise);
- Wrists, metacarpals and phalanges joints mobilization;
- Strengthening of hands and fingers with little balls, play dough and fingers strengthener (3 series of 10 repetitions for hands and 3 series of 3 repetitions for fingers);
- Mini squats on bipodal and/or unipodal supports and load shift in proprioceptive devices (3 series of 10 repetitions);
- Upper limb strengthening with pink elastic band progress-

Table 1. Pain of patients A and B, before and after physiotherapy intervention

	Patient A		Patient B	
	Pre-Intervention	Post-Intervention	Pre-Intervention	Post-Intervention
Pain	5	2	2	2
Site	Hands & feet		Knees	

Table 2. Quality of life of patients A and B, before and after physiotherapy intervention

	Patient A		Patient B	
Domains	Pre-Intervention	Post-Intervention	Pre-Intervention	Post-Intervention
Functional capacity	90	85	10	30
Limitation by physical aspects	100	100	0	75
Pain	62	100	61	72
General health status	42	72	82	92
Vitality	30	60	50	80
Social aspects	50	62.5	100	100
Limitation by emotional aspects	100	100	66.66	100
Mental health	68	76	96	100

ing to green and blue (3 series of 10 repetitions for each limb);

- Plantiflexion and dorsiflexion with 500g to 1.5kg ankle bracelets (3 series of 10 repetitions).

Patients were oriented to expire during muscle contraction to get better muscle fibers recruitment, which improves exercise performance. An interval from 30 seconds to one minute was adopted between series or cycles, but patients could interrupt activity for rest when needed. After the 15 physiotherapy intervention sessions, all parameters were revaluated.

Table 1 shows pain scores of evaluated individuals.

It was observed that, according to VAS, patient A had general pain decrease of 3 points, going from "moderate" to "mild", while patient B has maintained baseline general pain score, classified as "mild".

Table 2 shows QL scores of studied patients.

In general, patient A has maintained or improved 7 out of 8 domains addressed by SF-36, being that vitality, general health status and pain were aspects with best results, respectively. Patient B has maintained or improved all domains addressed by SF-36, being that limitation by physical aspects, functional capacity, vitality and limitation by emotional aspects had the best results, respectively.

DISCUSSION

Arthralgias and myalgias are reported as major complaints or most impacting symptoms by scleroderma patients[14]. In chronic situations, pain goes beyond the physiological period of tissue healing, causing physical and cognitive incapacity or impairing patients' wellbeing and QL[15].

So, QL of SS patients may be impaired as compared to healthy individuals[16], because it is inversely correlated to pain[9]. This is suggested by our study, because results have shown that when QL scores improved, pain scores decreased.

Biological aging leads to physiological processes failure, changing cell, tissue and systemic activity. In general terms, there is decreased muscle mass and strength, flexibility, joint resistance and mobility, coordination capacity and static and dynamic balance control[17]. In addition, evidences suggest that cold weather exacerbates SS symptoms, such as Raynaud phenomenon and joint and muscle pain[14]. This was also observed in our study because both patients had Raynaud phenomenon and wore gloves and stocks to prevent symptoms exacerbation.

It might be that these factors could have contributed to restriction of functionality and physical aspects of patients, because patient A has not improved functional capacity after intervention. In addition, participants were elderly patients living in a cold region to the South of Brazil and the study period was between March and June 2015, time when it is autumn in this region.

The more advanced is the age of SS patients, the lower are QL scores, especially with regard to physical aspects[7]. This is confirmed by your study because patient B (long-lived and with more advanced age) had lower QL scores as compared to patient A, being that "physical aspects" domain was zero before physiotherapy intervention.

Physiotherapy seems to play a critical therapeutic role, since it prevents musculoskeletal injuries, improves sleep quality, depressive symptoms, fatigue, pain, cognitive aspects, body image, static condition and maintains functionality, even of hand, which is fundamental for their QL[5,18,19].

Although there is no specific physiotherapeutic protocol for SS[18], functionality and DLA of these patients are maintained or improved if physical and occupational interventions are started early, assuring better long-term results[20].

Regular physical exercise has a possible anti-inflammatory effect on chronic diseases and may decrease immunosuppressant drugs consumption and/or doses[21]. Kinesiotherapy

(treatment by means of voluntary and involuntary movements) promotes mobility, flexibility, muscle coordination, increased muscle strength, pain control or improvement and resistance to fatigue[22]. This justifies the choice of kinesiotherapeutic exercises as the basis of the protocol.

A case study with an SS patient performing respiratory exercises has observed improved chest expansibility and inspiratory and expiratory capacities[11]. So, we decided for pulmonary expansibility exercises because pulmonary interstitial fibrosis is a very common manifestation among SS patients.

Soft tissue stiffness, common among SS musculoskeletal characteristics, may generate muscle weakness, atrophy for nonuse and pain[4]. On the other hand, stretching exercises promote restoration of flexibility and functionality[21]. So, we adopted muscle stretching as a strategy to fight musculoskeletal injuries and pain, because our patients had deformities and movement restrictions.

We have also adopted facial exercises because SS patients may present temporomandibular joint changes and mouth opening limitation[23].

On the other hand, in a study involving 40 SS patients, group (n=20) performing a protocol based on Kabat exercises, massage and facial exercises, with 18 physiotherapy sessions (1 hour per session, 2x/week, 9 weeks) has not improved QL according to SF-36[24] as compared to the control group (n=20) who performed home exercises. These results are different from our study, because patients A and B have improved all SF-36 parameters, suggesting better QL and pain control or improvement according to VAS.

CONCLUSION

A kinesiotherapy-based protocol was an effective strategy to control pain and improve quality of life of systemic sclerosis elderly patients.

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