

Physical therapy on the conservative treatment on adolescent with Scheuermann's Disease – a case report.

Fisioterapia no tratamento conservador em adolescente portador de Doença de Scheuermann – relato de caso.

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Abstract

Introduction: The Scheuermann's kyphosis may cause difficulties in social acceptance and in the practice of physical activity in adolescents, mainly caused by deformity of the thoracic spine. This change is diagnosed by radiological imaging when at least three adjacent vertebrae submit a previous larger than 5° wedging. Patients who have a Cobb angle greater than 75° are indicated for surgery. However, to date there is no agreement on how best to approach the patient in the conservative treatment. **Objective:** To present the conservative treatment of the back pain on an adolescent with Scheuermann's disease. **Method:** Case report of a young patient complaining of back pain and with the Cobb angle greater than 75°, treated with exercises and postural reeducation for 12 weeks. The changes on flexibility of the spine was measured by the popliteal angle and with a fio de prumo. Moreover, it was evaluated the isometric strength of the trunk, the functional capacity by the Oswestry questionnaire and the pain with a Visual Analogue Scale. **Results:** The patient improved with his pain and functional abilities, maintaining the practice of exercises by himself at home. **Conclusion:** After learning the exercises and practice it at home, with the orientation of a manual and the physical therapist, the patient do not presented any more complaining of pain.

Keywords: Scheuermann's Disease, Back Pain, Physical therapy

Resumo

Introdução: A Hiper cifose de Scheuermann pode trazer dificuldades de aceitação social e práticas de atividades físicas em adolescentes, causada principalmente pela deformidade da coluna torácica. Essa alteração é diagnosticada através de imagem radiológica quando ao menos três vértebras adjacentes apresentarem um acunhamento anterior maior do que 5°. Pacientes que possuem um ângulo de Cobb maior que 75° são indicados à cirurgia. Entretanto, até hoje não existe um consenso de qual a melhor forma de abordar o paciente no tratamento conservador. **Objetivo:** Apresentar o tratamento conservador para dor na coluna de um adolescente portador da Hiper cifose de Scheuermann. **Método:** Relato de caso de jovem com queixa de dor na coluna e com ângulo de Cobb maior que 75°, tratado através de exercícios e reeducação postural por 12 semanas. As alterações na flexibilidade da coluna foi medida através do ângulo poplíteo e com um fio de prumo. Além disso, foi avaliada a força isométrica do tronco, da capacidade funcional pelo questionário Oswestry e finalmente da dor através da Escala Visual Analógica (EVA). **Resultados:** O paciente obteve melhora no quadro de dor e ganho de função após a sexta semana de tratamento, que se manteve até a última avaliação após 12 semanas. **Conclusão:** Após aprender os exercícios e continuá-los em casa, sob orientação de um manual e do fisioterapeuta o paciente não apresentou mais queixas de dor.

Palavras-chave: Doença de Scheuermann, Dor Lombar, Fisioterapia

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INTRODUCTION

The Scheuermann's disease is the most common cause of back pain in adolescents^(1,2) with a predominance of male subjects.⁽³⁾ occurs between 10-12 years of age and is characterized by the anterior plate disorder growth of the vertebral body, leading to deformity in kyphosis.⁽²⁾ There is a decrease of physical fitness induced deformity, and social isolation, making the integration of these adolescents in society.^(2,4) The etiology is controversial, but factors such as hormonal changes, circulatory disorders and genetic factors appear to influence the onset of the disease.^(2,5)

The diagnosis is made by X-rays in profile was considered positive when at least three adjacent vertebrae submit a previous larger than 5° wedging. Scoliosis and decreased intervertebral joint space can also be found as radiological changes.^(6,7) The main clinical symptoms are back pain and deformity, rarely leading to other complications. In extreme cases can impair cardiorespiratory fitness. Physical examination is expected to kyphotic and rigid thoracic spine, which with hypomobility during extension. Hamstring muscle retractions, added to weakness of the extensor muscles of the trunk reinforce the patient's posture.^(3,8)

Impaired quality of life of these patients is mainly related to aesthetic factors and decreased functional capacity. The difficulty of sports activities and the acceptance of body image hinder their social interaction and this is a critical age at which they are constructed personality traits of the patient.⁽⁷⁾

Surgical treatment is indicated for patients whose Cobb angle is greater than 75 degrees or rapidly progressing disease that does not respond to conservative treatment. Despite this, conservative treatment becomes of utmost importance, even when the angle of kyphosis is low (between 45 and 55 degrees) due to the degenerative nature of the vertebrae deformity.^(7,9) This consists of core-training exercises for strengthening the thoracic spine flexibility of the posterior thigh muscles and strengthen the extensor muscles of the trunk.⁽⁹⁾ The use of brace is indicated when the kyphosis is median (angles between 55 and 65 degrees) and with a good degree of mobility of the thoracic spine.^(3,6,7,10)

Few studies describing the evolution of the treatment of adolescents with Scheuermann Hyperkyphosis, the objective of this case study was to demonstrate the effects of therapy on quality of life and function of a patient with this chest deformity with marked kyphosis.

METHOD

Male patient, 17 years old, 1.70 m height, 95 kg and Cobb angle of 78 °. Complaining of chest deformity and pain (VAS 2.5) in the transition from thoracic and lumbar spine approximately two years ago with progres-

sive worsening. It was tried to perform physical activity at that time and obtained improvement in frame with swimming practice, but he do not continue with this activity and there was regression. Since then, about six months ago, referred pain for walking, lifting weights and realizes continually tries to correct your posture to feel uncomfortable in the lumbar region. Never underwent treatment for their pain with guidance of a physiotherapist.

Three evaluations were performed: pre-treatment, after six weeks and after twelve weeks of treatment.

Postural assessment with plumb bob

The plumb line was used in this study to evaluate the orthostatic posture curvature of the spine in the sagittal plane of the patient. During the evaluation, the patient remained facing a wall, barefoot, with both heels touching the two together and hallux on the wall, keeping a fixed look forward, shoulders relaxed and normal respiration. A ruler with a plumb line is hung at its end is leaning against the head and the upper pole of the plumb line distance is measured from the spinous processes of the vertebrae C7, T12 and L3 in relation to the most prominent point of the thoracic kyphosis.⁽⁷⁾

Evaluation of popliteal angle

The evaluation was performed using the popliteal angle test. The test consists in performing knee extension evaluated passively until the therapist feels the first endurance stretching. The evaluation of the popliteal angle was performed bilaterally.

Evaluation of trunk isometric force

Muscle strength was assessed with manual isometric dynamometer. Three sets were performed, lasting five seconds each, followed by 30 seconds of rest between each repetition. Four movements were measured: Flexion, extension and lateral inclinations.⁽¹¹⁻¹³⁾

Pain Assessment and Functional Capacity

Pain was assessed by Visual Analogue Scale for Pain (VAS) consisting of an aid in the assessment of pain intensity in patients. Its score ranges from zero (no pain) to ten (worst pain ever felt).

Functional capacity was assessed by the Oswestry questionnaire in order to assess the perspective of the patient, performing daily activities. It is a self-administered questionnaire consisting of ten questions each with six alternatives. The amounts of the matters vary from zero to five. The higher the score achieved by the patient, the lower the functional level it presents.

Eleven physical therapy interventions divided in six weeks were performed. Subsequently the patient continued with the in physical therapy exercises at home for six weeks with the help of a manual, which consisted of simple exercises to enhance and maintain the re-

sults achieved in the first six weeks. Isometric and isotonic invigoration exercises of the extensor muscles of the trunk were prescribed, moreover, exercises for chest mobility, flexibility of hip flexors, knee flexors and lower chest, as well as exercises to increase body awareness. The manual followed a model similar to those made in the first six weeks to facilitate the achievement of exercises by the patient. (Table 3)

The physical therapy intervention consisted of increased mobility of the spine, strengthening exercises of the trunk extensor muscles and stretching of the hamstrings, lower chest and hip flexors. If in doubt, the patient was asked to come into contact with some of those responsible for the work.

RESULTS

Postural assessment with plumb bob

The results are shown in Figure 1. Observe a slight improvement in third evaluation results with respect to the first two.

Popliteal angle

The results are outlined in Figure 2. After six weeks of treatment there was an improvement in the flexibility of the right leg and loss of flexibility in the left lower limb. After 12 weeks the flexibility was the same pattern as the original, and the right lower limb smaller than the left, however the two measurements with less angle.

Isometric strength of trunk

The results and their means are shown in Table 1. All muscle groups tested showed increased isometric strength compared from the first to the second evaluation, values which have changed little in the third assessment, except in flexion, which from the beginning of treatment and its final had a significant increase.

Pain and Functional Capacity

The results are shown in Table 2. Observe a significant improvement of the questionnaire with results showing maximum score in relation to functional capacity and absence of pain in the last assessment.

DISCUSSION

The results of this case report showed that strengthening the extensor muscles of the trunk associated with stretching of specific muscles brought improved func-

tional capacity and pain the patient with Scheuermann’s Disease.

In a study of 351 patients aged 17-21 years, the sum of strengthening exercises with postural orientation resulted in an average decrease of 2 points in the VAS these patients. In the case of the patient described in this article VAS decreased from 4 to 0 after six weeks of treatment.⁽¹⁴⁾

During the assessment of trunk muscle strength was found that all assessed muscle groups showed increased strength, especially the flexors. Importantly, this improvement was maintained at the last review occurring after the period that the patient performed the exercises under the guidance of a physiotherapist.

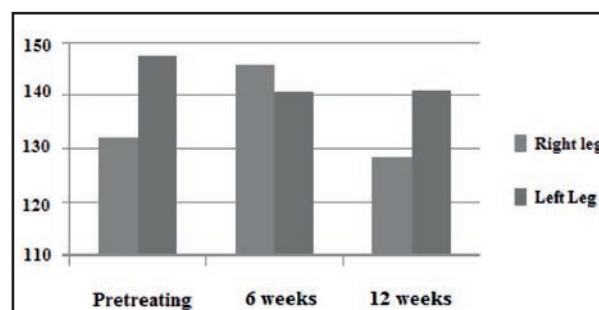


Figure 2. Popliteal Angle.

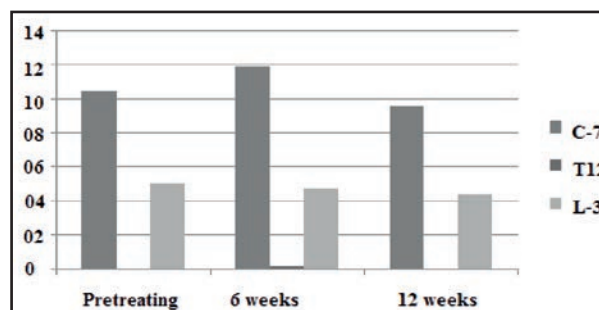


Figure 1. Postural Assessment with Plumb Line. C-7: Seventh cervical vertebra, T-12: Twelfth thoracic vertebra, L-3: Third lumbar vertebra.

Table 1. Isometric strength of trunk.

Mean	Pre-treatment	6 weeks	12 weeks
Flexion	3.23	12.6	11.1
Extension	14.63	16.6	16.6
Right tilt	20.83	29.9	27.8
Left tilt	27.73	31.4	29.5

Table 2. Pain and Functional Capacity.

	Pre- treatment	6 weeks	12 weeks
Questionnaire Oswestry	10 points = 20 %	6 points = 12 %	0 points = 0%.
EVA	04	2.5	0

VAS: Visual Analogic Scale.

Table 3. Exercises protocol.

Exercises	Repetitions/Time Week 1,2,3	Repetitions/Time Week 4,5,6
Posteroanterior central (PAC) spinal mobilization associated with extension of the spinal column made on the top of the thoracic curve.	Level IV, 3 x 1 min	Level IV, 3 x 1 min
Roll on the thoracic top: (length gain) Patient supine, is placed a roll (Figure X) under the top of the thoracic curve and the patient and is asked the patient to drop body weight and bend your arms so that they touch the stretcher.	3 x 1 min	3 x 1 min
Diaphragmatic breathing: patient supine, is asked to inhale using the strength of the diaphragm to inflate the stomach and depress the lower ribs, and then exhale.	3 x 15 rep	3 x 15 rep
Stretching of the pectoralis minor. Patient supine, place a towel between the shoulder blades and perform stretching the shoulders pushing the patient toward the stretcher.	3 x 1 min	3 x 1 min
Bascula on the ball Patient sitting on a therapy ball 65 cm. Perform movements anteversion and retroversion pelvic on the ball.	3 x 1 min	3 x 1 min
Stretching hip flexors: Patient supine with pending members on the stretcher, flex the contralateral hip stabilizing it, while hip extension is made to be stretched.	3 x 1 min	3 x 1 min
Stretching posterior muscle chain: Patient supine, member to be stretched is placed in flexion of the hip and knee while the hip and knee of the contralateral limb is flexed.	3 x 1 min	3 x 1 min
Thoracic extension in pronation: Patient prone performs repeated spinal extension actively times.	3 x 30s a 1 min	3 x 1 min
Isometric paravertebral standing.	3 x 30 seg a 1 min	3 x 1 min
Ponte ventral: Patient supine performs the elevation of keeping the pelvis lined trunk.	3 x 20 seg a 1 min	3 x 1 min
Bilateral external rotators associated with thoracic extension with elastic resistance.	3 x 12 a 20 rep	3 x 20 rep
Low rowing with elastic resistance.	3 x 12 a 20 rep	3 x 20 rep

Subtitle: rep=repetitions; min=minutes.

In static postural assessment, no significant changes were found, probably due to structural disease is, difficult to correct by kinesiotherapy factor. However, the functional improvement can be attributed to a higher mobility of the thoracic spine acquired with the exercises.

The realization of stretching the posterior muscles of the thigh did not lead to an increase in the popliteal angle of the patient. Thus it has not been possible to correlate the results of this intervention.

The first half of the intervention period was performed in situ, with visits to the physical therapy. It is noteworthy that the patient has a Cobb angle of 78 ° that characterizes a possible surgery, and although this ceased to feel pain and obtained maximum scores of functional capacity in the questionnaire. In the second part, the exercises were performed by the patient at his residence. Although a small decrease in muscle strength of the trunk found after this period, the results of the questionnaires remained the same, demonstrating that the achievement of home exercises added guidance of

daily activities were sufficient to maintain the positive results in the first half of job.

The latest consensus of conservative treatment of idiopathic hyperkyphosis and Scheuerman's disease of SOSORT conducted in 2010, concluded that the best measures to be taken in these cases are the use of the brace and physical therapy. But what about physical therapy modalities to be used there is still no consensus.⁽⁶⁾

CONCLUSION

There are few studies on the conservative treatment of Scheuerman's disease. Some doubts still remain about the follow-up therapy as including more efficient therapeutic modalities, type of brace to use, and prognosis of conservative or pre-surgical treatment. In this case report it was shown that it is possible to work with exercises and gain body awareness for improved posture in everyday life. The patient began working in care of physical therapy, but the end was performing the exercises as instructed alone in his house, and thus managed to maintain the clinical improvement of pain.

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