PHYSICAL-KINETIC THERAPY IN ANKYLOSING SPONDYLITIS WITH HIP ARTHROPLASTY

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INTRODUCTION

Ankylosing spondylitis is a common type of arthritis with a chronic evolution and multifactorial inheritance (Van der Linden S, colab, 2009). The major histocompatibility complex genes have an important influence in genetic susceptibility to the disease, but today it is known that in addition to the strong strong association with HLA-B27, other genes are also associated with this disorder (Brown MA, 2011). The disease affects 0.1%—1.4% of the population, initially affecting the spine and sacro-iliac joints (Kenna TJ, colab, 2011). It is an important cause of pain and stiffness, leading to long-term disabilities.

Osteoarthrosis, is the most common chronic degenerative joint disorder, with the same long-term evolution and disabling potential (Lane NE, 2007). It is also a multifactorial disease, being influenced both by genes and by environmental factors (Juhakoski R, colab, 2009)
CASE REPORT

We present the case of a 49 years old male patient, from a rural area, hospitalized in the Medical Rehabilitation Clinical Hospital Baile-Felix, for cervical pain, right hip joint pain, difficulties in walking (using a cane for long distances), functional recovery. The family history revealed that his mother had osteoarthritis and stroke. From his medical history we mention that he has blindness of the left eye, due to a trauma at 5 years old, he was diagnosed with ankylosing spondylitis in 1985 and had a left hip arthroplasty in 2006.

Complains are now of permanent nature, of high intensity, increasing in clinostatism and with discreet improvement after mobilization. These complains are accompanied by dysfunction, thus, affecting activities of daily life. He attended annual medical rehabilitation since 2000 in Medical Rehabilitation Clinical Hospital Baile-Felix, with discrete improvement of symptoms and function.

Based on the history and background we established the diagnosis of cervico-dorso-lumbar vertebral syndrome, static and dynamic, through ankylosing spondylitis. The other diagnoses were: dysfunctional status after left hip arthroplasty and right coxalgic syndrome, possible through hip osteoarthritis secondary to coxitis.

Clinical examination revealed: the abnormal signs regarding the respiratory system were abdominal breathing and restrictive type respiratory dysfunction. Otherwise, examination of other systems revealed normal data with the exception of the locomotor apparatus, with:

- dorsal kyphosis with lumbar lordosis disappearance
- frontal project of the head and neck, resulting the "skier" position
- Cervical column: lack of mobility in all axes
  - distance menton-sternum was 23 cm.
  - distance tragus - acromion 13 cm (right) and 12 cm (left)
  - distance occiput- wall 26 cm
- Lumbar column: - anteflexion of lumbar spine is made from hips
  - lateral inflexion and extension limited = 0
- Measurements:
  - Schober 13 cm
  - OTT= 30/31 cm
  - Stibor from C7 to L5 = 48 cm and with flexion = 49 cm
  - Thoracic perimeter = 103 cm / 103 cm
- shoulder joint-normal mobility
- the right hip joint:
  - limited rotation,
  - limited abduction = 10\(^0\)
  - internal rotation = 25\(^0\)
  - external rotation = 15\(^0\)
  - flexum right hip = 30\(^0\)
  - flexion = 20\(^0\)
- the left hip joint (hip prosthesis):
  - normal mobility allowed by prosthesis
  - flexion = 65\(^0\)
  - abduction = 35\(^0\)
  - internal rotation = 15\(^0\)
  - external rotation = 15\(^0\)

Regarding gluteal muscles weakness and limping were also observed. Trendelenburg could not be appreciated, because of the prosthesis and flexum of hip.

Analyzing the medical history and the clinical examination we established the clinical diagnosis of ankylosing spondylitis, clinical and functional stage 3, central-peripherical type (Elyan M, colab, 2006). The other diagnoses were right hip osteoarthritis secondary to coxitis, status post left hip arthroplasty and blindness of the left eye.
We asked for the following laboratory examinations:

- Blood chemistry - where we found elevated triglycerides.
- CBC revealed ESR = 13 mm/h
- Fibrinogen- 368 mg/dL
- PCR ++ (strongly positive)
- Rheumatoid factor - negative

Cervical, dorsal, lumbar spine and pelvis X-rays revealed:
- cervical rectitude profile
- dorsal kyphosis
- dextroconcave lumbar scoliosis with rectitude profile
- multiple synovial osteophyte spinal block, "tram track" aspect at dorso-lumbar level, square vertebrae, osteosclerosis of vertebral angles, osteoporotic background.
- bilateral sacroiliac ankylosis
- uncemented total left hip endoprosthesis with normal prosthetic ratio.
- right hip joint with severely narrowed space, important osteophytosis and insufficient internal rotation of the thigh.

Conclusion: ankylosing spondylitis with bilateral sacroiliitis stage 4

Abdominal ultrasound did not show any abnormality. ECG was without pathological changes. Eye examination for uveitis was negative. Spirometry was performed for restrictive ventilatory dysfunction: FEV1, VC.

We assessed the degree of disease activity using BASDAI index (Bath Ankylosing Spondylitis Disease Activity Index), the value of this score ranging between 0-100 (Garrett S, colab, 1994), and obtained 70 for this patient.

Based on history, the objective examination and laboratory examinations have established the following diagnosis:


Differential diagnosis:

1. for ankylosing spondylitis: seronegative spondyloarthropathies, laboratory showed negative rheumatoid factor (ankylosing spondylitis is the central element in this group of arthropathies) (Weisman MH, colab, 2006):
   a) Reiter syndrome, characterized by the triad of urethritis, conjunctivitis, arthritis, but in our case urethritis and conjunctivitis are missing.
   b) psoriatic spondyloarthropathy, which is characterized by peripheral joint involvement (asymmetric), axial joint involvement (sacroiliitis and spondylitis) that justify inclusion among seronegative spondyloarthropathies. In this case missing dermatosis exclude this diagnosis.
   c) Behcet disease-the elements for easiest differentiation are the evolution in net flares and broad spectrum of extraskeletal manifestations of Behcet disease: skin lesions (necrotic pseudofolliculitis, pseudo-erythema nodosum), vascular involvement (recurrent thrombophlebitis, arterial aneurysms) and neurological involvement (aseptic meningoencephalitis).

2. for hip osteoarthritis secondary to coxitis (Felson DT, 2009)

The diagnosis is based on limited mobility of the hip, presence of pain, radiological aspect, will be differentiated from:

a) primitive hip osteoarthritis
b) hip osteoarthritis secondary to dysplasia (excluded by X-ray)
c) hip osteoarthritis secondary to femoral dislocation, acetabular protrusion
d) hip osteoarthritis secondary to other deviations: coxa valga, coxa vara
Treatment:

- Objectives:
  1. Control of pain and inflammation
  2. Combat contractures, muscle retraction and muscular functional imbalances
  3. Reeducation of posture, symmetry, body and walking alignment
  4. Regain joint mobility, muscle tone and trophicity
  5. Ameliorate respiratory function

- Therapeutic means:
  A) Hygienic-dietary means:
     - Sufficient caloric intake, but with a high proportion of animal protein in order to reduce dystrophy
     - Supplement of vitamins, especially B and C groups
     - Moderate-salted diet and with protection of gastric mucosal
     - Avoiding alcohol, spices, meat soups, concentrated sweets (not to increase gastric secretion)
     - Smoking is contraindicated because it worsens restrictive ventilatory dysfunction, adding an obstructive dysfunction type. It also increases the risk of complications e.g. tuberculosis.
  B) Medication: NSAIDs
  C) The patient has an indication for prosthetic right hip surgery,
  D) Medical rehabilitation treatment

1. Hidrokinetotherapy at 36 degrees, 20 minutes, with the aim to obtain: - better mobility, as water heat relieves pain, relaxes muscles
   - better control of posture

2. Kinetotherapy is crucial in ankylosing spondylitis. It combines exercises addressed to spinal static and dynamic disorders from ankylosing spondylitis and exercises designed for hip prosthesis and hip osteoarthritis.
   It aims to:
   - maintain mobility of vertebral column, to tonify the paravertebral muscles, to preserve respiratory function
   - maintain and correct posture
   - maintain and improve joint mobility
     * Working positions during the program will always be from those with discharge the vertebral column to its gradual charging;
     * Programs and exercises will be interrupted when pain occurs and restarted when pain is moderate, in quiet phases;

     Effort dosing is based on physiological factors (heart rate, blood pressure, fatigue occurrence);
     * Programs will focus on maintaining outstanding mobility of the spine both of entire column and segments
     * Toning the muscles that mobilize the spine will be done through specific isometric or isotonic exercises

- Objectives and the means that are used:
  • maintaining and correcting body positions and alignment :
    - good posture in everyday activities using maintenance of erect position of the trunk (sitting on a chair with a high backrest and permanent contact of the back to the backrest);
    - corrective postures (dorsal decubitus, small pillow under dorsolumbar column, 2 sandbags of 2-5 kg on the anterior face of the shoulder and other 2 bags on the knees).
  • maintaining and improving joint mobility:
    - free active mobilization, addressing to the spine, hips and shoulders, trying to reach the extreme limit, focusing on the extension (Hernández-Molina G, colab, 2008).
    - stretching.
• maintaining and correcting muscle tone:
  - free active mobilizations, active mobilization with resistance - for shoulders and hips aiming to tone the pectoralis major muscles and active stretches of leg/hamstring muscle groups;
• reducing flexum of hip through posture and stretching
• gluteal muscles tonification
• walking reeducation
• maintaining and increasing mobilized respiratory volumes:
  - in the early stages will focus on respiratory corrective gymnastics. Thoracal respiratory reeducation aims to raise awareness on thoracic cage and abdominal movements during breathing phases.
  An appropriate kinetic program will be performed all the lifetime - 2-3 daily sessions, each session lasting 15 - 30 minutes.

  To get a better physical condition and to remain able to move, it is very important that individuals suffering from ankylosing spondylitis also exercises at home.

3. Paraffin cape and on the right hip, with painkiller and muscle relaxing effects
4. Diadynamic cervical currents, with painkiller and decontracturant effects
5. Massage of the superior train/muscles (effects on skin, circulation and muscles)
6. Underwater shower
7. Laser, with inflammatory effect, muscle relaxing

The evolution is chronic, progressive and irregular. Prognosis: the vital prognosis is good, but the functional one is reserved because of the mobility limitation of vertebral column and hip. Work prognosis is also reserved.

Complications:
• atlanto-axial luxations or subluxations, and possible spinal fracture, both with static and neurological consequences
• rigid, osteoporotic and with ankylosis vertebral column is more fragile than the flexible one, and is very susceptible to even minor trauma fractures
• different diseases:
  - cardio-vascular (aortic insufficiency, arrhythmia less often)
  - gastro-intestinal (inflammatory bowel disease such as ulcerative colitis and Crohn disease, peptic ulcer secondary to NSAID administration)
  - renal (proteinuria and microscopic hematuria most frequently)

Recommendations at discharge:
• Kinetic-program daily, 2-3 times / day with a duration of 15 to 30 minutes
• Correct use of cane (cane is held in the hand opposite to the affected hip and will be moved along with the affected limb, putting the foot on the ground on the same line with the cane)
• Biannual medical rehabilitation

The peculiarity of the case: even if this is a typical case of ankylosing spondylitis, with the typical position of "skier", with restrictive ventilatory insufficiency and the disease was diagnosed 28 years ago, only the musculoskeletal system is affected, with maintenance

DISCUSSION

Ankylosing spondylitis is a complex, severe, disabling disorder. The primary goal of the therapy is to maximise long term health-related quality of life, by different means, using pharmacological and non-pharmacological treatments (Braun J, colab, 2011). Today medical therapy has significantly improved prognosis of patients, especially for ankylosing spondylitis. Still, kinetic therapy remains important, complementing medical treatment (Nghiem FT, colab, 2008). Water therapy improves symptoms and also function. Patients who also performed home exercise programs have had an improvement of symptoms, mobility, function and overall quality of life (Elyan M, colab, 2008; Dagfinrud H, colab, 2008).
Long-term effectiveness of exercise therapy was demonstrated by several studies (Pisters MF, colab, 2007; Wright AA, colab, 2011). Pisters MF showed that behavioral graded activity had a better effect on hip osteoarthritis than usual exercise therapy. Difficulties in management of such patients, in establishing the appropriate physical kinetic program are also due to osteoporosis that occurs in these patients (Korczowska I, colab, 2008; Ghozlani I, colab, 2009).

Medication combined with physical kinetic and thermal baths therapies had led to disability reduction and ameliorated quality of life in patients with ankylosing spondylitis (Colina M, 2009).

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