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Physiotherapy in ankylosing spondylitis

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Introduction

Ankylosing spondylitis (AS) is a chronic and progressive systemic disease characterized by the occurrence of inflammation and later ossification in the sacroiliac joints, spine joints, peripheral joints and tendons. It causes pain, swelling, limitation of mobility and partial or complete stiffness of the spine joints. AS is the second most common inflammatory disease of the joints right after rheumatoid arthritis. In most patients, the first symptoms appear between 15 and 40 years of life.

In 90% of patients, the presence of HLA-B27 antigen is found. However, not everyone with this antigen will be affected by AS. This disease is 2-3 times more likely to affect men than women. [1]

Clinical picture

Depending on the location of the symptoms, the following forms of ZZSK stand out:

- classic, which affected sacroiliac joints and joints of the spine,
- with the involvement of sacroiliac joints, spine joints and hip and shoulder joints,
- with the involvement of sacroiliac joints, spine joints, knee and ankle joints, shoulder joints, and elbow and wrist joints,
- a Scandinavian form in which spine joints, sacroiliac joints and minor joints of the hands and feet are occupied [2].

In the initial stage, the changes appear in the sacroiliac joints, they usually appear in the form of pain in the area of the joints. Pain is the result of developing inflammation in the joint. These complaints usually appear at night, lying down. In addition, there is morning stiffness in the joints, which lasts about 30 minutes and it usually goes away while moving. In women, the disease often starts with pain in the cervical spine. [3]

In next stages, inflammation appears in the higher segments and includes the following elements of the spine: intervertebral joints, fibrous rings, ligaments, rib-and-vertebral joints, rib-transverse joints. After some time, the spine becomes ossified. The process of ossification in the joints of the spine leads to the limitation mobility of the chest, which often forces breathing abdominal pattern of breathing. Ossification of spine joints and costovertebrales joints cause more and more pain during breathing and everyday activities. [3,4]

Ankylosing spondylitis is a systemic disease and affects not only the organ of movement but also the functioning of the whole organism. Common symptoms are: fever, fatigue, loss of appetite, weight loss, acute iritis.

In 25-40% of diseases, recurrent iritis and cilium, with severe irritation and photophobia. Each subsequent recurrence worsens the functioning of the eye, even leading to loss of sight. The disease may also have heart symptoms. The most common are: cardiac valve regurgitation, conductivity disorders, and aortic inflammation.

Stiffness in the chest leads to the so-called frozen chest and restrictive ventilation disorders.

People suffering from AS are also at risk of bone loss leading to osteoporosis. Osteoporosis in AS

is secondary and its prevalence varies between 20-60%. The appearance of osteoporosis is determined by such factors as: chronic inflammation, limitation of physical activity, sedentary lifestyle, calcium absorption disorder and treatment with corticosteroids. Stiff osteoporotic spine and changes in the peripheral joints cause fractures even with minor injuries. The frequency of spine fractures in patients with AS is four times higher than in healthy people. [4]

Figure of patient with AS

Involvement in the disease process of the sacroiliac joints and the spine causes a change in the patient's profile. Widening ossification within the lumbar spine causes flattening of physiological curvature, increased paraspinal muscles tension and limitation of joint mobility.

The changes in the thoracic segment relate to the rib-vertebral and rib-transverse joints, the ossification of which primarily results in stiffening of the chest. The spinal column is set in deepened kyphosis, which additionally makes the respiratory movements are reduced and the breathing pattern changes to diaphragm. That shape favors the development of contractures in the breast muscles.

The head of the patient is advanced much forward, which causes deepening of the cervical lordosis and muscle contraction as well as limitation of the mobility, to complete stiffness. [5]

Diagnosis

Diagnosis at the early stage of the disease involves the collection of an interview and the performance of imaging diagnostics. Early radiological changes appear in the form of: narrowing of the joint crease and sclerosis in the sacroiliac joints, in the upper part of the lumbar region, the stems are demineralised and the ligaments are calcified and the syndesmophytes are formed. In the further period of the disease, the X-ray picture ossified the spine and the surrounding tissues make the spine resemble a bamboo stick. Currently, the diagnosis of AS is based on the modified New York criteria from 1984:

Clinical criteria:

- occurrence of pain in the sacro-lumbar region lasting longer than 3 months, decreasing after exercise, present despite therest,
- limitation of the mobility of the lumbar spine,
- limitation of chest mobility in relation to the correct values appropriate to the age and sex.

Radiological criterion:

- the 2-4 degree bilateral inflammatory changes in sacroiliac joints or 3-4 degree unilateral inflammatory changes in sacroiliac joints.

Certain diagnosis of AS requires a radiological criterion and one or more clinical criteria. A probable diagnosis is when the patient has 3 symptoms from a clinical criterion or only a radiological criterion [6,7]. The examination includes a detailed interview, and the physical examination concerns the observation of curvatures of the spine, mobility of the spine joints and sacroiliac joints. Functional tests such as the Menell test, Patrick's test, fingers-floor test, Degi wall test, Schober test, Molla-Wright test, Otto-Wurm test are used for the measurements. In addition, a measurement should be made to determine the difference in chest circumference during inspiration and exhalation, and the examination of muscle tone in the back. [7]

AS treatment

The treatment of AS is a long-term process requiring a comprehensive approach to the problem. Treatment includes patient and family education, pharmacotherapy, physiotherapeutic treatment, psychological care and sometimes even surgical treatment.

The main goals of therapy are:

- pain reduction.
- inhibition of the inflammatory process,
- improvement of mobility in the joints of the spine and chest,
- improvement of locomotion abilities,
- increasing independence in everyday activities,
- increasing participation in family, social and professional life,
- improvement of well-being and self-esteem. [8]

Physiotherapy in the treatment of AS

The role of physiotherapy in the treatment process is very important. Long-lasting inflammation causes muscle disorders, degenerative changes in the joints, disturbances in their mechanics. Conservative treatment is primarily aimed at alleviating pain and improving the quality of life. In the treatment of AS applies kinesiotherapy, physical agents, manual procedures, special therapeutic methods. The choice of treatments is adapted to the current state of the patient, depending on stage

of disease the patient is: in the initial stage of the disease, in an advanced state, in remission or exacerbation. [2, 7, 8]

An important element in the treatment of AS is the use of pharmacotherapy, which complements the physiotherapeutic process. Disease exacerbations often force patients to give up treatment with physical activity, then drug treatment is recommended. The purpose of pharmacotherapy is to remission or reduce exacerbation.

Kinesiotherapy aims to delay the process of stiffening and deformation of joints, improve muscle strength, improve the range of motion in the joints and maintain overall fitness and efficiency of the body, improve the function of self-care and locomotion. Exercises should be focused on erector spinae muscles, gluteal muscles, abdominal muscles and relaxing of the breast muscles and flexors of the hip joints. Therapeutic procedures should be completed with breathing exercises. In the initial stage of the disease, the patient should learn to breathe in the low-rib breathing pattern. Due to ossification in the rib-transverse and rib-vertebral joints, exercises increasing the mobility of the chest should be used, exercises increasing the range of mobility of the shoulder girdle and exercises counteracting the deepening of thoracic kyphosis, diaphragm exercise with resistance and without resistance. It is best to start breathing exercises after relaxing the chest muscles with the use of massage, heat treatment, and relaxing exercises [6, 8].

In therapy, an important element is total suspension with lying back or aside in UGUL. In the first phase of the suspension, the focus should be on redressing the hip, shoulder and spine joints, and performing exercises with rotational movements of the pelvis and spine. In the second phase, lateral flexion of the spine and abduction in the hip joints are performed. In the third phase, the patient is suspended on the side to increase the possibility of movement in the sagittal plane. The exercises in UGUL can be complemented by water exercises.

In the exacerbation, the patient particularly suffers from pain, which is why it is necessary to support analgesics and anti-inflammatory drugs. Physiotherapy is limited at this time. Breathing exercises, isometric exercises and simple lying exercises should be performed several times a day. In the case of very acute inflammation in the joint, it should be immobilized for a period of about 4-5 days. The immobilization time should be kept to a minimum, because inactivity favors the deepening of changes and the formation of muscle contractures. During this period, it is important to lay the spine appropriate while lying down. A roller should be placed under the lumbar spine and the position of the upper limbs should be changed frequently. The patient should also lie on the

abdomen 3 times a day for 20-30 minutes. Each period of exacerbation of the disease process leads to changes and disorders in the musculoskeletal system. Each time after the period of exacerbation, the rehabilitation program should be adapted to the current state of health.

During the remission of the disease, active exercises are used to prevent restrictions in the joints of the spine. Exercises should be performed in all planes, exercises in isolated positions are recommended to increase the movement in a particular section. In the cervical spine, caution should be exercised due to the possibility of subluxation in the atlas-axis joint. [2, 3, 6]

According to the guidelines developed by ACSM for people with chronic diseases, maintenance therapy should be supplemented by daily exercise at home, 3 times a week for 30-45 minutes. Regular physical activity has a positive effect on the improvement of muscle flexibility, emotional condition and quality of life of the patient. Recommended forms of physical activity: walks, Nordic walking, dorsal swimming, bike ergometer exercises, table tennis. Cycling, strength training, horse riding, volleyball, rowing are not recommended.

Spa treatment also has a beneficial effect on AS. All existing contraindications for spa treatment should be taken into account beforehand. The most commonly used are treatments such as mud wrapping, salt baths, sulphide baths and radium baths.

Special methods used in patients with AS include: trigger point therapy, Proprioceptive Neuromuscular Facilitation (PNF), kinesiotaping and joint mobilization (Cyriax, Kalterborn, active joint mobilization according to Mulligan) [8]

Summary

Ankylosing spondylitis is a seronegative rheumatoid disease. In terms of incidence, it is in the second place among inflammatory diseases of the joints, right after rheumatoid arthritis. The initial symptoms of AS are uncharacteristic, they are difficult to recognize in the first stages of the disease. For this reason treatment is often delayed. Patients complain primarily about pain and stiffness in the sacroiliac joints and spine joints. The disease make daily functioning significantly difficult, and also causes a decrease in the quality of life. Treatment of the disease is long-lasting and comprehensive, it combines many different areas, such as pharmacotherapy, physiotherapy, psychology, patient education. A very important element of treatment is rehabilitation. The main goal of rehabilitation is to improve the quality of life and relief from the existing pain. The choice of methods used depends on the current state of the patient, on whether he is in an exacerbation or

in the remission phase and on the main problems he is reporting. [1, 2]

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