CONTEMPORARY ASPECTS IN KINESITHERAPY (PHYSIOTHERAPY) IN TREATMENT OF ANKYLOSING SPONDYLITIS

(Review article)

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Abstract
This report offers a survey of different research cases that follow through on the effects shown by various forms of Kinesitherapy applied in cases of ankylosing spondylitis. Those research cases have been conducted in different parts of the world in the course of the last several years. Bearing in mind the disabilities caused by the illness and the combination of the above, we have showcased a number of different resources applied in different order and duration, based on scientific research.

Keywords: forms of Kinesitherapy, rheumatology, Morbus Bechterew, physical exercises

INTRODUCTION
The Ankylosing Spondylitis (AS) is a prototype in the group of the Spondyloarthropathies. The disease is a chronic inflammatory rheumatologic process. Typically it passes with spondylitis combined with sacroiliitis. As the disease progresses it may lead to the development of syndesmophytes and the occurrence of ankylosis. It is a chronic seronegative spondyloarthritis with an etiology that is not completely cleared yet. It occurs in the interaction of the genetic factors and the environment. (Zochling & Braun, 2005).

As often starts during the second or third decade of human life, demonstrated by a persistent inflammatory pain in the back. In its early stages the disease could be associated with loss of functions, inability to work and a reduced quality of life (Zochling & Braun, 2005).

Kinesitherapy (Physiotherapy) in treatment of Ankylosing Spondylitis
The Recommendations to treat AS include the relevant medical treatment and the physical exercises as the two main cornerstones. It is recommended that the non-pharmacological treatment includes regular physical exercise and training of the patients (Zochling & Braun, 2005). The focus is on the exercises helping to improve and maintain the mobility of the spine because of the typical characteristics of the disease. In spite of that the latest research shows that there is an increased risk of cardiovascular diseases (Peters, et al., 2010). That’s why it is important that the patients’ exercises aim to improve multiple aspects of their physical shape.

Combined data from 11 cohort studies and 763 patients show that the results from the exercising at home or the training monitored by a physiotherapist are better than no exercise at all. Also the group monitored by physiotherapists showed better results than the group exercising at home. The combined hospital SPA exercises, followed by group physiotherapy, prove to be better than just exercising in a group.

The physiotherapy program needs to be individually built and in accordance with the form, stage and persistence of the disease (Rjaskova (Рязкова), 2003). The character of the illness imposes the need of avoiding the continued burden. The author recommends the duration of the session to be relevant to the activeness of the process – 15 min. by high level and 45-60 min. by minimal, several times a day. It is considered that by minimal or moderate activity several times a day a certain pain reaction is admissible, but it should not last more than 2-3 hrs. after the end of the therapy.

In order to ensure maximal understanding and cooperation during the implementation Troev (Троев) (1993) suggests that the aim of the physiotherapy is to be explained. He recommends that the therapy is constantly combined with diathermic stimulation and sauna treatment, and swimming as an element of sports.

The aim of massage in case of AS is to relieve the pain, reduce the increased muscle tone and stretch the shortened muscle structures. It is recommended that it precedes the motor exercises (Falkenbach, 2005).
Warner (2000) describes that besides the variations of the classic massage in cases of AS there are indications for implementing the neuro-reflexive massage developed by Marniz. He believes that in AS cases it makes sense to apply the combination of passive movement and massage in the same way as in the manipulative massage introduced by Terrier.

Nikolova - Jaramlakova (Николова - Яръмлъкова) (2003), believes the combination of classic massage principles with acupuncture to be appropriate.

Falkenbach (2005) writes that the main aim of physiotherapy has to be the achieving of maximal balance between the muscles agonists and antagonists (Table 1). He suggests that the muscle strength and elasticity have to be often exercised, which could partially improve the muscle functions - coordination and endurance. He offers the following table that represents the ratio and the need of intensification of the muscle strength and stretching.

The breathing exercises by patients with AS aim, directly or indirectly, to affect the ventilation, blood supply of the lungs, evacuation of secretions, the chest mobility, intensification and improvement of the coordinated contractions of the respiratory muscles, expansion of the mobility of the diaphragm, improvement of the physical abilities, preparation and warming up of the body. They also apply an apparatus for breathing exercises Voldyne (Tyco Healthcare Kendall) for improving the vital capacity, (Falkenbach, 2005).

In Günay, et. al., (2012) they determine that the exercises with medium intensity improve the functions and decrease the activeness of the illness. They came to the conclusion that the success of the research came as a result of the continuity of the treatment rather than the duration of the exercises. They also determine that the breathing exercises have a positive effect on decreasing the pain, the clinical status and the respiratory function and ensure better quality of life for AS patients.

Falkenbach (2005) describe the content, aims and impact of underwater exercises: alleviation of body weight and joints with reduction of the muscle tone; easing of the pain; facilitation of general mobility; improvement of peripheral blood circulation; advancing the mobility of the spine and the joints close to it; correction of posture; reinforcement of the postural muscles; simulation of balance and coordination; improvement of everyday activities, cardiopulmonary training, stimulation of the chest mobility and breathing technique.

Altan, Bingo, Aslan, & Yurtkuran (2006.) apply SPA treatment exercises in a pool for 3 weeks, daily, 30 min. per day. It is established that the SPA treatment has an additional effect on decreasing the activeness of the illness and improving of the functional parameters immediately after the period of treatment. In another study, they apply Pilates in order to treat AS.

During a 12 month longitudinal randomized study

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Need of increasing</th>
<th>Need of stretching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensors muscles of the back</td>
<td>++++++++++++++++++</td>
<td>+</td>
</tr>
<tr>
<td>m. rhomboideus</td>
<td>++++++++++++++++++</td>
<td>++</td>
</tr>
<tr>
<td>Oblique muscles</td>
<td>++++++++++++++++++</td>
<td>+++</td>
</tr>
<tr>
<td>Straight abdominal muscles</td>
<td>++++++++++++++++++</td>
<td>+++</td>
</tr>
<tr>
<td>m. quadriceps</td>
<td>++++++++++++++++++</td>
<td>+++</td>
</tr>
<tr>
<td>m. gastrocnemius</td>
<td>++++++++++++++++++</td>
<td>+++++</td>
</tr>
<tr>
<td>m. iliopsoas</td>
<td>++++++++++++++++++</td>
<td>+++++</td>
</tr>
<tr>
<td>Neck muscles</td>
<td>+++</td>
<td>+++++</td>
</tr>
<tr>
<td>Ischiocrural muscles</td>
<td>++</td>
<td>++++++++++++++++++</td>
</tr>
<tr>
<td>m. pectoralis</td>
<td>+</td>
<td>++++++++++++++++++</td>
</tr>
</tbody>
</table>

Table 2. Recommended program according to the American College of Sports Medicine

<table>
<thead>
<tr>
<th>Frequency – days of the week</th>
<th>Intensity</th>
<th>Duration</th>
</tr>
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<tbody>
<tr>
<td>Cardiorespiratory fitness</td>
<td>3–5</td>
<td>55–90% from the maximum heart rate</td>
</tr>
<tr>
<td>Muscle strength</td>
<td>2–3</td>
<td>8–12 repetitions (10–15 for older or weaker patients). Last repetition has to be before the tiredness kicks in.</td>
</tr>
<tr>
<td>Flexibility</td>
<td>2–3</td>
<td>10–30 sec., 4 repetitions for every muscle group</td>
</tr>
</tbody>
</table>

Table 1. Need of stretching and increase the muscle strength for patients with Bechterew according to Falkenbach, (2005)
Fernandez-de-Las-Penas, Alonso-Blanco, Morales-Cabezas, & Miangolarra-Page (2005) establish that the exercise in regime based on the global postural muscle re-education, acting specifically on strengthening and exercises for flexibility of the shortened muscle chains offers promising short and long term results in AS patients’ treatment. A stretching method with duration between 45 sec. and 4 min. is used for every position.

During research conducted in Switzerland has been proven that an 8 week long application of manual and automobilizations of the spine has improved the excursions of the ribcage, the posture and mobility of the spine of AS patients. The treatment protocol consists of warming up the back muscles; active and passive mobility exercises for the spine; stretching of the tightened muscles and manual massage (Widberg, Karimi, & Hafström, 2009).

Ince, Sarpel, Durgun, & Erdogan, (2006) conduct a randomized study and prove that the application of a multi-module program, combined with medical treatment, offers a great improvement in the mobility of the spine, the working capacity and the expansion of the chest.

Table 2. shows the following exercise program for AS treatment utilized by the American college of Sports Medicine.

Karapolyat, et al., (2009) prove that aerobic exercises like walking and swimming in combination with conventional exercises increase the functional capacity of the AS patients and have a beneficial effect on their quality of life and their breathing function.

Carbon, et al., (1996) research the effects of a 30-minute long ergometry with an intensity about 100 W (on average 98.8 W; range 34–151 W) on 11 male patients whose hip joints were not affected. In most cases the exercises have not only immediately increased the lateral flexibility of the spine but also decreased the pain. Those positive effects unfortunately are short lasting and disappear after 3-5 hours.

Halvorsen, Vøllestad, & Fongen (2012,) report that in cases of decreased cardio respiratory capacity and reduced flexibility the physical therapy has to include exercises - the main component for reducing the cardiovascular risk.

Other researchers (Lim, Moon, & Lee, 2005) mention that physical exercises could be the way to go in case of restrictive physical working capacity, reduced mobility of the spine and the joints and decreased breathing function.

Henderson (2003) reports about a clinical case where the following treatment methods were applied: exercises with Swiss-ball; manual manipulations of the spine or tender mobilizations within the patient’s tolerance; the (PNF)-techniques „hold-relax“ and „contract-relax“ are preferred because of several reasons; the neuromuscular rehabilitation of the wrong mobility models; the equilibrium, the balance of the posture are exercised in a sensorimotor manner through increasing of proprioception with balance-board and balance-sandals; the Brugger exercise; accent on the abdominal breathing and deblocking of the diaphragm; automobilizations training (Henderson, 2003).

Results of Lubrano & Spadaro (2009) clearly show that any physiotherapeutic program plays only a partial role in the treatment of the disease and doesn’t completely affect or cure AS. That’s why the concept about combination treatment through biological means and rehabilitation is to be found in several studies that show a synergistic effect of biological agents and rehabilitation. In a research done by them Etanercept and intensive stationary rehabilitation prove to be more effective than a simple physiotherapy program.

A considerable improvement in daily life has been established in a study done by Colina, Ciancio, & Garavini (2009). The study suggests that kinesitherapy (physiotherapy) will continue to play an important role for the management in the era of biological medications.

In 2013., 140 patients participated in a Chinese research. 31,4% of patients had no recommendations for the exercises 20,7% had non-specific recommendations. Swimming is the most recommended exercise by doctors (23,6%), and the home treatment of AS patients included mostly exercises (12,1%) and walking (5,9%). Only 27,9% were persistent in exercising at least 3 times a week (Guan, et al., 2013).

The exercises improve the function of patients especially in more severe cases. The motivation of the patients increases with the execution of the exercises. (Brophy, et al., 2013; Falkenbach, 2003).

CONCLUSION

Based on the research conducted it is to be determined that the kinesitherapy (physiotherapy) is irreplaceable and necessary in the treatment of AS patients.

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