REHABILITATION ACTIVITIES IN PATIENTS WITH PNEUMONIA

M. Becheva, PhD
Medical University- Plovdiv, Medical College, Bulgaria, “Buxton Brth.” 120, 4004 Plovdiv

Abstract. Pneumonia continues to be one of the most topical and serious diseases today. The primary goal of pulmonary rehabilitation is the best possible functional recovery of the patient in order for him to achieve greater independence in daily life. A kinesitherapeutic program focuses on improving the functional status of patients and their abilities for self-service. After the application of physical therapy, along with standard medical treatment for the sick, the following favorable changes set in: physical tolerance and stamina increase, deeper breathing, reduces the amount of "trapped" air in the lungs and bronchial tree, shortness of breath at rest and in performing physical activity is also reduced, lung volumes and the amount of inhaled air increase. Prevention consists in well-timed effective treatment of acute inflammatory diseases of the lung, and avoidance of harmful conducive factors which lead to chronic respiratory diseases, including smoking, cold, damp, dusty and dirty air.

Keywords: bronchopneumonia, rehabilitation, kinesitherapy

I. Introduction
Pneumonia continues to be one of the most topical and serious diseases nowadays. Before the development of antibiotics treating pneumonia, for 1/3 of all patients the disease was fatal. Although today there are modern antibiotics, pneumonia is a major cause of death among infectious diseases and ranks 5th in the statistics of lethal diseases. Unfortunately, mortality from pneumonia in patients at risk worldwide is high and is within 30-40%. On the contrary, statistics shows that for people with relatively preserved health to the age of 65, who do not abuse alcohol and do not smoke, the mortality rate is around 5% [1].

Pulmonary rehabilitation is integrated into a comprehensive approach to patient treatment and is individually aimed at reducing the severity of respiratory symptoms, optimization of functional status, keeping patients in stable condition, preventing complications in other organs and systems and reducing economic costs and the need for health care. Complex treatment includes an assessment of the patient’s condition, conducting kinesitherapeutic procedures, training and psychosocial support[2].

II. Aims of pulmonary rehabilitation
Rehabilitation programs for patients with pneumonia are well-established in practice, supporting standard therapy (medicines, inhalations, oxygen, etc.) with a view to monitoring, mitigation and reduction of subjective complaints, optimization of the functional capacity of patients and prevention of their early disability.

The primary goal of pulmonary rehabilitation is the best possible functional recovery of the patient in order to achieve greater independence in daily life. The aim is achieved by increasing the physical activity of patients, their acquaintance with the specific features of the disease, methods of treatment and opportunities for dealing with emergencies.

The first steps in the treatment of pneumonia are the so-called “general measures”. These include the right food and bed rest, hydration, medicines to combat fever, cough, pain and respiratory failure [3].

III. Diagnostics
Diagnosis is based on medical history revealing symptoms of the overall physical review (status) as well as a number of valuable ways among
which the most important methods of imaging, microbiological tests and blood tests. From the radiological perspective, the presence of inflammatory changes in the lungs or the so-called “pulmonary infiltrate” are usually detected.

By seeding of mucus (sputum) of specific nutritional environments with the presence of antibiotic discs, there can be found the microorganism causing the changes, as well as the most appropriate medication for it. [4]. Blood tests show evidence of infection while gas analysis determines the degree of eventual respiratory failure. In bronchopneumonia the conditions for the formation of pulmonary heart are often created due to deteriorating diffusion of gases and the degree of hypoxemia, so electrocardiograms are mandatory. To establish a LC status, functional studies of the cardiovascular system and DS are used:

- Count of number of breaths in one minute – lying down, a sheet of paper is placed in the epigastric region and the respiration rate is monitored by the movements. A normal average male value is 16-18, while in women it is with 1-2 breaths more.
- Testing with prolonged counting – the deepest breath is taken and then counting is performed orally in a quick fashion without re-taking of air. In the absence of problems, the count continues up to 80-100.
- Centimeters of the chest (Hirts 1, 2 and 3)

These studies are performed before the start and after the end of the kinesitherapeutic program [5].

IV. Treatment

Medicated methods:

Treatment of infection-induced pneumonia is effected with the aid of antibiotics. In the treatment of acquired pneumonia, a means of initial choice are broad-spectrum antibiotics from the group of protected beta-lactams, macrolides and new fluoroquinolones. In severe cases, and in hospital, a combination of antibiotics is used most frequently [6].

Herbalism:

There are many possibilities. Tee tops of pine, plantain / ribwort / basil, coltsfoot, elder, chamomile, nettle root, flax and others work well for cough. Consultation with an naturopathic doctor is recommended.

In cases of constipation, enemas with warm water or a decoction of chamomile are mandatory, followed by steam compresses on the abdomen. Urinary enema yields better results. In cases of high temperature, the feet should be applied with a compress of vinegar and finely pounded salt. They should be wrapped well with cotton pieces. These packs should be changed every 1-2 hours [7].

Dietetics:

Food in such cases should be easily digestible. It is not recommended to consume dairy products, meat, fish, cakes and alcohol. Cigarettes are extremely harmful. Fresh juices, hot vegetable broths and purée of seasonal vegetables, paste, buckwheat, millet, rice and others are most suitable. At home, one can drink oat milk all day. Oatmeal should be boiled until water turns white. It is soaked for 20 minutes and then is strained. Warm liquids should be drunk with honey and lemon. Honey to sweeten is boiled in water bath for 10-15 min. in order not to irritate the mucous membrane [8].

Other recommendations:

The room in which the patient lies in should be sunny and well-ventilated. The patient should be at rest, undisturbed. The heart is very vulnerable in this case and should be spared.

A positive psychological attitude is very important throughout the treatment period. Auto-suggestion should be done several times a day. After the crises abate, the patient should start the hardening act. Dry brush massage, rubbing, moderate sunbathing, walking in fresh air every day are fairly beneficial [9].
Physical methods:
Physiotherapy combines natural healing methods with the help of which the body’s defenses can be mobilized. It can be combined with certain drug treatment measures. A similar combination appointed by the doctor significantly improves the results of chronic disease treatment. In the training of deteriorating functions of the body, physical therapy uses heat and cold. Water best conducts heat and cold. Hydrotherapy uses water as a means to obtain the desired response of the organism. In the form of baths, partial baths, pouring, showers and wet wraps, the mechanical, chemical and thermal irritation of water is applied on the whole body through the skin. The expected reactions affect the circulation, metabolism, the functions of the endocrine secretion, thermoregulation, the nervous system, etc. Other methods that can be applied are inhalations with medicinal drugs and mineral waters; stays in the sauna 1-2 times a week; spa procedures [10].

Kinesitherapeutical methods:
Passive:
Classic massage – performed from starting position – front leg, then from occipital leg. In bronchiectases and rich expectoration, one can start form a drainage position with the head situated lower than the chest. Relaxation of paravertebral muscles follows. Attention is drawn to the intercostal musk, and processing occurs around the shoulder blade. Then vibration follows in the expiratory phase. The thorax on the front is handled by stretching and anesthesia of pectoral muscles, processing of over- and subclavian fossa, intercostal muscles, vibrations and shaking of chest are performed in time with exhalation. Duration 20-25 min [11].

Reflex massage:
Periosteal massage – periosteal findings are searched on the transverse processes of the vertebrae, back of the ribs, shoulder blades, then on the front of the ribs and sternum. The rhythmic pressure on the point, during the expiratory phase, starts from the back and at the farthest caudally located points, then passes to the front, as the procedure starts also from the most low-lying points. All painful periosteal points are processed. Duration – about 20 min.
Connective tissue massage – the so-called “big edifice is carried out, with typical download tangential fold of skin with the tip of III and IV finger. Operating from a sitting position of the patient, mainly on the back. Because the skin on the back, particularly on the side of the edge of m. latissimus dorsi, is very mobile, a good stretch of the subcutaneous connective tissue takes place by to counterretaining. Duration - about 45 min.
Reflex – Segmental massage – applied on the chest and shoulder girdle. At finding seals in the area between IV and IX rib, indirect vibration is applied.
Acupressure – it is suitable for application at the beginning or during an attack, which leads to alleviation of breathing. Between attacks, acupressure reduces the occurrence of seizures, and sometimes may even prevent them.
Zone therapy – used in the period between attacks. It is performed for a long time – it takes about 30 procedures. Emphasis is placed on areas with more expressed palpable tenderness as precedence is given to the endocrine glands, lung, solar plexus [12].

Active:
Kinesitherapy in bronchopneumonia acts as a tonic and stimulant therapy for preventing the patient from pathological, morphological changes in the lungs - adhesions, atelectasis, chronicity etc. It is important to train the thermoregulatory system and to increase the overall resistance of the organism.
The kinesitherapeutic means include: generally developing and breathing exercises that increase the vital capacity, including all parts of the lungs; exercises and techniques supporting and stimulating blood circulation; exercises for large muscle groups of the limbs and trunk; exercises of a different starting position, paying attention to proper breathing when walking, climbing stairs and doing various exercises [13].
Practical exercises, games, walking, hiking, hardening agents and others are recommended.
The use of exercise bike has a very good effect on young patients with good performance status.
Load and duration increase gradually, monitoring the pulse and blood pressure [14].

**Methods of application:**
Kinesitherapy is applied after lowering the temperature and improving the general condition of the patient. The start-up period is from 2 to 4 days while in severe cases it takes longer. Because of the risk of formation of pulmonary heart, exercises to the distal portion of the upper and lower extremities are given, facilitating the activity of the heart and the circulatory system. The main exercises take 5-12 days inpatient treatment, depending on the condition of the patient and the inflamed lung sections. The patient’s activities with physical therapy continue 1-2 months after their discharge [15].

For maintenance therapy activities and outdoor sports (being among nature) are best, as well as sports games involving the upper limbs, water sports (moderately) and others. Conducting the activities is accompanied by monitoring the patient’s condition. A consultation with the physician and – particularly the acquaintance with the information about the status and stage of lung disease is mandatory [16].

**Increase in tolerance to kinesitherapy**
Physical exercises increase the oxygen needs of the body due to the increased demands of the working muscles. The intact respiratory system responds by switching on the spare capacity of the lungs, breathing quickens and deepens, increasing the amount of inhaled air [17]. In patients with bronchopulmonary diseases, the capacity of the body to respond to physical stress is disturbed. The combination of airflow obstruction, airway collapse and loss of parenchymal elasticity causes the limitation of peak flow, leading to insufficient full exhalation at rest. Trapped air remains in the lungs, which increases the operational lung volumes and reduces their ability to expand further in physical burdens [18].

The kinesitherapeutic program focuses on improving the functional status of patients and their abilities for self-service. In elderly people, a gradual reduction in the maximum oxygen consumption is established, which, apart from age, depends on the decrease in physical activity and an increase in body fat, especially after the age of 60. After the application of physical therapy, along with standard medical therapy, the following favorable changes are established in patients: increased physical tolerance and stamina, deeper breathing, reduction in the amount of “trapped” air in the lungs and bronchial tree, reduction of shortness of breath at rest and during the performance of physical activity, lung volumes and the amount of inhaled air increase. [19] The increase in tolerance to exercises is an indication of the amount of activity that the patient is able to perform in everyday life. The increased endurance in the application of physical exercise is closely related to how long patients can stay active and cope with ordinary activities in daily life.

Kinesitherapeutic programs are an essential part of the treatment strategy for patients with pneumonia to influence, control and reduce the subjective complaints and optimize the functional capacity of patients with a view to preventing their disability [20].

**V. Conclusion**
Pulmonary rehabilitation is an essential part of the overall treatment plan for treatment of diverse clinical symptoms characteristic of lung conditioned respiratory failure. It is a science-based, multidisciplinary and comprehensive intervention for patients with chronic respiratory diseases that often have reduced overall physical activity.

Prevention consists in well-timed effective treatment of acute inflammatory diseases of the lung, and avoidance of harmful conducive factors which lead to chronic respiratory diseases, including smoking, cold, damp, dusty and dirty air. Medical specialists recommend hardening procedure treatments and climatic-sanatorium treatment after recovery from acute infection of the respiratory system [21].

**References**


Corresponding author:
Maria Vakrilova Becheva
Medical College of Medical University – Plovdiv
Plovdiv 4004 „Buxton Brh 120“
Tel: +359 32641882
E-mail: olivier@abv.bg