

Respiratory Gymnastics and Respiratory Exercise Machines for Bronchial Asthma

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SUMMARY

Bronchial asthma is current and widespread problem in medicine. About 300 million people have this disease. Despite rather effective medicines, helping to remove and warn the suffocation attacks, to improve quality and life expectancy, breathing exercises and respiratory exercise machines are applied to complex therapy at any stage and a stage of development of a disease. The main objective of these exercises at a combination to medicamentous therapy is restoration and development of full breath, i.e. normalization of ratios of a breath and exhalation. There is a set of techniques and respiratory exercise machines for the patients having bronchial asthma such as respiratory gymnastics according to Strelnikova, Buteyko and Gnevushev. The proved respiratory exercise machines of Frolov and Samozdrav, are also widely used at an integrated approach to treatment.

Keywords: Bronchial asthma, respiratory gymnastics, respiratory exercise machine.

INTRODUCTION

Today a widespread and current problem in medicine is the bronchial asthma (BA). By estimates of WHO, about 300 million people have this disease. In our country, according to an epidemiological research, the prevalence of BA among adults is 6.9%, and among children and teenagers there are 10%^{1,2,3}. According to the experts, annually the number of the diseased increases and will reach 400 million people by 2025. The Bronchial Asthma (BA) is a global problem of health care that is connected with a steady tendency to growth of incidence and social losses at this pathology⁴.

Now doctors and scientific community are faced by the main issue in selection of the correct, adequate, full, safe and effective treatment of this illness. Integrated approaches and efforts not only of the doctor, but also the patient are necessary for successful therapy. According to the recommendations of the Russian respiratory society, main objectives in treatment is an achievement and maintenance of good control of symptoms BA for a long time; minimization of risks of future aggravations BA, the fixed obstruction of respiratory tracts and undesirable side effects of therapy. The basic principle of treatment is step therapy which depends on a form, weight, control and duration of a course of the main disease. The medicines and dosages are applied to each of a step. Treatment is carried out by means of inhalation and system glucocorticosteroids, β 2-agonists short and long action, anticholinergics short and long action, bronchodilators long action, leukotriene receptor antagonists^{1,4}.

It is known that respiratory insufficiency develops in person with BA that leads to a hypoxia and as a result to a complication of a current and control over asthma. Despite rather effective medicines, helping to remove and warn the suffocation attacks, to improve quality and life expectancy, breathing exercises and respiratory exercise machines are applied to complex therapy at any stage and a stage of development of a disease. The objective of these exercises at a combination to medicamentous therapy is restoration and development of full breath, i.e., normalization of ratios

of a breath and exhalation. There is a set of techniques and respiratory exercise machines for the patients having bronchopulmonary pathology including BA⁵.

One of popular, available and effective breathing exercises is the respiratory gymnastics according to Strelnikova. Aleksandra Nikolaevna was an opera singer. Saving herself from suffocation attacks, she developed own system of breath together with the mother. Later she said: "Being a young singer, I lost a voice. And mother began to look for a way for me to restore it. The gymnastics was so gradually invented". Results of application of gymnastics were published at institute of Vishnevsky. So, the spirometry showed increase in volume of air, the capnogram showed gas exchange improvement. In 1973 copyright of this technique was registered. This type of gymnastics is simple and effective. The respiratory technique has a various impact on an organism: strengthens respiratory muscles, trains a diaphragm, restores nasal breath, increases drainage function of a bronchial tree, influences adhesive processes in lungs, improves blood circulation in a pulmonary parenchyma, thereby promotes the fastest resorption of the inflamed sites, increases lymphatic drainage function and eliminates developments of stagnation, removes hypoxemic processes, perfusion of tissues with oxygen accelerates, that improves metabolism and trophic processes in organs and tissues. At deep breath heart rate decreases, pressure is stabilized that also positively affects the central nervous system – the nervous status, insomnia leaves⁵. Bases of respiratory gymnastics include the following criteria of performance. The breath – short and noisy, is carried out by a nose. The exhalation – passive, is carried out by a mouth in itself and without efforts. A.N. Strelnikova's gymnastics consists of a large number of various exercises. The following exercises will be more preferable to the people suffering BA. «Fists» - in a standing position the short breath is taken and fists are at the same time clenched, then – a quiet exhalation by a mouth and a release of fists. «Pump» - legs together, shoulders are relaxed. The patient takes a short breath, at the same time bending forward and carries out hands the

movement imitating inflating of the pump. On an exhalation straighten up. «Shoulder straps» - hands are compressed in fists and pressed to a stomach at the level of a belt. At the time of a breath it is sharp to push fists down as much as possible to a floor. Then return hands to a starting position. "Embrace shoulders" - hands are bent in elbows and lifted to the level of shoulders. To make a breath, to embrace itself for shoulders, hands have to be parallel each other without crossing. On an exhalation to reach a starting position. "Turns by the head" - legs together. To turn the head in one side, to make a breath. Then to turn the head in other side and again to make a breath. The head does not remain in middle position^{5,6,7}.

Also it is worth to mention a technique of respiratory gymnastics by Konstantin Pavlovich Buteyko. The Soviet scientist adhered to the theory that the problem with breath is connected in excessive saturation by oxygen and decrease in carbon dioxide in blood which leads to an alkalosis and owing to what there is breath oppression. Buteyko practiced superficial breath and conformed to the three rules. The first is to try to breathe always only a nose even if it is stuffed up. The second is to level breath and to reduce it by means of relaxation. The third is not to allow a strong shortcoming and the shortage of oxygen. This technique is rather simple and can be executed in house conditions. As a result of long-term clinical practice of use of respiratory gymnastics in treatment and stopping of attacks of bronchial asthma, in 1985 the order of the Ministry of Health of the USSR on introduction of a method of Buteyko in clinical practice was issued. Since 1991 and till present there is a center of Buteyko in Voronezh which founder was Konstantin Pavlovich. In the center much attention is paid to work with children who have various bronchopulmonary diseases^{5,8,9}.

Technique of respiratory gymnastics according to V.V. Gnevushev. Vladimir Viktorovich Gnevushev, doctor of medical sciences, professor, head of the department of physiotherapy exercises, medical control and physical therapy. For years of scientific activity he developed a set of techniques, one of which was a technique of respiratory gymnastics. The essence of a method consists that the breath of the patient has to be rarer, longer and less deep, than at usual breath; the breath should not be full that the person feels a lack of air. The exhalation is made involuntarily, passively, stretched. Experiments showed that the patient who regularly does respiratory gymnastics according to V.V. Gnevushev the breath stretches twice, breath becomes rarer, the consumption of oxygen is optimized. Generally the technique is applied to patients with bronchial asthma. The breath needs to be made silently and quietly. In the course of the training there is an assimilation of the skill directed to reduction of volume of the inhaled air and by increase in duration of a breath that reduces a hyper excitability of nervous receptors of bronchial tubes and bronchioles during exacerbation of bronchial asthma. Also, as a result of performance of breathing exercises the minute volume of breath (MVB) reaches optimum level, ventilation of dead space decreases, and alveolar ventilation increases. Advantages of this method is its combination to all cyclic exercises, restoration of functions of organs of a respiratory system, activation of the immune system¹².

Not all patients having bronchopulmonary diseases including bronchial asthma, are capable to carry out respiratory gymnastics fully and without harm for health. It is connected with the fact that at the heavy course of asthma patients have the expressed respiratory insufficiency and as a result heavy cardiovascular pathology. To the aid to such people, along with basic medicamentous therapy, various respiratory exercise machines come.

Respiratory exercise machine of Frolov. Vladimir Fedorovich Frolov was an academician of a number of the International academies, doctor of philosophy, Candidate of Biology, biochemist, Russian inventor, scientist, author of the theory and technology of endogenous breath. At the age of 25 Frolov V.F. got sick with tuberculosis, then the purpose of his philosophy became recovery of health and extension of youth. For many years the inventor conducted researches and put experiments before understood that change of a way of breath is a right way to health and longevity. Leaning on K.P. Buteyko and R.B. Strelkov's techniques about a normobaric hypoxia, Vladimir Fedorovich made the decision to create such device which gives resistance to any person on an exhalation and a breath. Having conducted a number of researches of the created device, Frolov found out that breath by means of his invention revitalized an organism as forced cells to breathe actively, that is stimulated breath of membranes which provide themselves with energy and oxygen by free radical oxidation of nonsaturated fatty acids. Frolov's exercise machine, or "The exercise machine Respiratory Individual (Frolov's inhaler)" (TDI-01) is the portable device consisting of the internal camera having a ground nozzle with openings and the external camera glass with a cover. In the exercise machine about 20 ml of water are filled in and hydraulic resistance is created at each breath and an exhalation which are carried out through water. Water is poured in a glass by means of the syringe or a graduated cylinder, then the ground mesh nozzle densely joins the internal camera and is located in a glass. After that the respiratory tube is passed through an opening in a cover for a glass and connects to the internal camera. The glass is densely closed by a cover which moves down a tube, and the mouthpiece is inserted into the free end of a tube. Operation of the exercise machine is based on a training of a breath and exhalation in the conditions of positive pressure in a respiratory system with the lowered oxygen content. It is necessary to breathe by means of the exercise machine consistently, with a certain rhythm with a resistance to a breath and exhalation through water. Movements of a diaphragm are coordinated with a breath and an exhalation. Among numerous indications to the exercise machine there are diseases of a respiratory organs (bronchial asthma of any etiology, chronic bronchitis, emphysema of lungs, a silicosis), and contraindications to a method are the asthmatic status, the respiratory insufficiency which is followed by an anoxemia and a hypercapnia. There are three modes of exercises on the exercise machine: preparatory mode, main mode, mode of increasing reserves of an organism. It begins with the preparatory mode, then switch over to the main mode of exercises. To achieve the positive effect, it is necessary to be engaged on the exercise machine once a day, in the

evening (before going to bed), at the same time. After the regular trainings patients with bronchial asthma have a reduction of attacks of suffocation, increase in the period of remission^{5,13,14,15}.

Respiratory Samozdrav exercise machine. It is the device intended for respiratory trainings for the purpose of prevention and treatment of various bronchopulmonary and heart diseases, raises adaptation opportunities of an organism. The purpose of this exercise machine comes down to breath resistance, both on a breath, and on an exhalation was created. Also there is a respiratory gymnastics in the mode of adaptation breath which is directed to adaptation of an organism in the conditions of the increased content of carbon dioxide and at the same time lowered oxygen content on a breath. This exercise machine is recommended for independent training in house conditions. The technique is as follows: breath is made only through a mouth. Position of a body is chosen any. Breath is equal, quiet. The breath should not be deep, and the exhalation should not be sharp. It is necessary to begin trainings of breath gradually, from 3 to 10 minutes a day, daily increasing time. Optimum duration has to be 30-40 minutes a day continuously throughout 3-4 months^{10,11}.

CONCLUSION

In the conclusion we will note that despite the checked and available techniques respiratory gymnastics and exercise machines which are capable to facilitate the patient's state, to increase quality of life and to reduce the number of aggravations, you should not forget that this course of exercises will replace medicinal therapy in no way. These exercises are addition to modern therapy of bronchial asthma which becomes more and more effective at an integrated approach, as practice shows.

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