

FEATURES OF THE REACTION OF THE CARDIOVASCULAR SYSTEM TO PHYSICAL EXERCISE IN PATIENTS WITH PULMONARY TUBERCULOSIS

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Annotation. The aim is to study the response of the cardiovascular system to physical exercise in patients with infiltrative pulmonary tuberculosis. The features of adaptive capacity of the cardiovascular system was considered to physical stress on the results of the sample Martine-Kushelevskogo. The study involved 88 male and female patients with infiltrative pulmonary tuberculosis at the age of 21-35 years. Found that as a result of intoxication syndrome in pulmonary tuberculosis decrease adaptive capacity of the cardiovascular system. The positive effect of physical exercise on the studied parameters. The need to study the adaptive capacity of the cardiovascular system in these patients in order to correct and individualization of physical activity for each patient.

Keywords: tuberculosis, physical, pressure, adaptation, response, cardiovascular, system.

Introduction

At the present stage Ukraine is rated among countries with high level of tuberculosis morbidity and has the highest level of morbidity than most of countries of Central and Eastern Europe. As per criteria of World health protection organization epidemic of tuberculosis has being existed in our country since 1995, and from that time has been continuing to extend. Tuberculosis morbidity in Ukraine has reached the level of 84.1 persons per 100 thousand of population and mortality is 25.3 persons per 100 thousand of population, Besides, 67.4% of those, who fell in tuberculosis for the first time, are the persons of the most workable and reproductive age – from 20 to 50 years old [7, 11, 12].

In the opinion of academician A.Ya. Tsyganenko and prof. S.I. Zaytseva (2004) [10], infiltrative pulmonary tuberculosis takes, to some extent, intermediate place among other clinic forms: it can be both weak and evolutionary form of tuberculosis. In the structure of morbidity it prevails (up to 40% and more). In the period of epidemic this indicator is much higher (up to 60 % and higher).

The main method of treatment of this disease is medicamental therapy, however, among curing means, with therapy of pulmonary tuberculosis, physical activity is of rather great importance, which renders comprehensive health improving effect owing to increasing of different human organs' and systems' functional activity. Treatment of this disease takes much time and it results in rising of periods of temporary disability [8,10,13]. Acceleration of patients' recovering is possible only with applying of complex functional therapy, which is a system of actions, which cause certain positive responses and shifts in different physiological systems of a patient. To these kinds of influence, first of all, therapeutic physical training (TPT), massage, inhalation therapy, physio-therapeutic procedures, conditioning to cold and labor-therapy are rated [3, 4, 5].

Now health improving gymnastics for patients, suffering from tuberculosis, is applied; it is a system of physical exercises of little and middle intensity (depending on the state of a patient) with little amplitude for torso, superior and lower limbs. Regular application of physical exercises improves functioning of cardio-vascular and respiratory systems. In the process of physical exercises' training correct mechanism of breathing is developed, breathing abnormalities are eliminated, ventilation of lungs improves, adhesions and other complications are prevented from, posture is normalized. In physical rehabilitation of patients, suffering from tuberculosis, it is necessary to consider possible lung pathologies and phase character of such changes, the state of cardio-vascular system and its response to dozed physical loads [3, 4, 6].

TPT is prescribed with fading of acute process and improvement of a patient's general state that does not permit to use physical exercise to full extent in physical rehabilitation of weakened patients; besides, physical exercises do not influence completely on the progressing of tuberculosis process as well as on the aftereffects of medicamental chemical therapy. Tuberculosis process in lungs is cured only with the help of medicamental therapy, which causes significant negative changes in nervous and cardio-respiratory systems [4, 6].

The work has been fulfilled as per combined plan of scientific & research works in the sphere of physical culture and sports for 2011-2015 of Ministry of education and science, youth and sports of Ukraine by subject: "Traditional and non traditional methods of physical rehabilitation with diseases of different organism's systems and injuries of supporting motor system of persons of different physical level". Code of subject 4.1, state registration No. 0111U000194.

Purpose, tasks of the work, material and methods

The purpose of the research is studying of cardio-vascular system's response of patients, suffering from infiltrating pulmonary tuberculosis, to physical load in order to optimize dozing of loads in the process of TPT.

The tasks of the research:

- determination of peculiarities of cardio-vascular system's response of patients, suffering from infiltrating pulmonary tuberculosis, to dozed physical load before application of physical rehabilitation methods;
- comparison of peculiarities of patients' cardio-vascular systems' response to dozed physical load after application of TPT, which includes physical exercises with elements of yoga asanas, yoga breathing exercises, regulated

breathing exercises, considering the tonus of sympathetic and parasympathetic branches of patients' vegetative nervous systems (the authors' methodic) and therapeutic gymnastics by methodic of V.N. Murza (1976, 2004).

Materials and methods of the research. The research was carried out in Kharkiv regional anti-tuberculosis dispensary No.1. Our observations covered 88 patients (male and female) with were arbitrary divided into groups: main and control. The first group consisted of men of first maturity (22-35 years old) – 23 persons (average age – 28.9 years); women of first maturity (21-35 years old) – 21 persons (average age – 24.71 years). Control group consisted of first maturity men (22-35 years old) – 21 persons, (average age – 28.24 years) and first maturity women (21-35 years old) – 23 persons (average age – 26.52 years).

Results of the research

The type of cardio-vascular system's response to dozed physical loads of patients we evaluated by the results of Martinet-Kushelevskiy's test, which was carried out in 5th-6th day of patient's staying in dispensary [1, 9]. The test results showed that the examined patients had hypotonic type of response as prevailing (39,1% of main group men and 38,1% of control group men and 47,6% and 47,8% of women correspondingly). Hypertonic type of response was manifested by 21,7% of main group men and 28,6% of control group. (by 33,3% and 26,1% of women correspondingly), dystonic – by 21,8% of main group men and by 14,3% of control group men; concerning women - 4,8% and 4,4% correspondingly). Normotonic type of response was registered at 17,4% of main group men and at 19,0% –of control group men; among women – at 14,3% of main group patients and 21,7% of control group patients (see fig. 1).

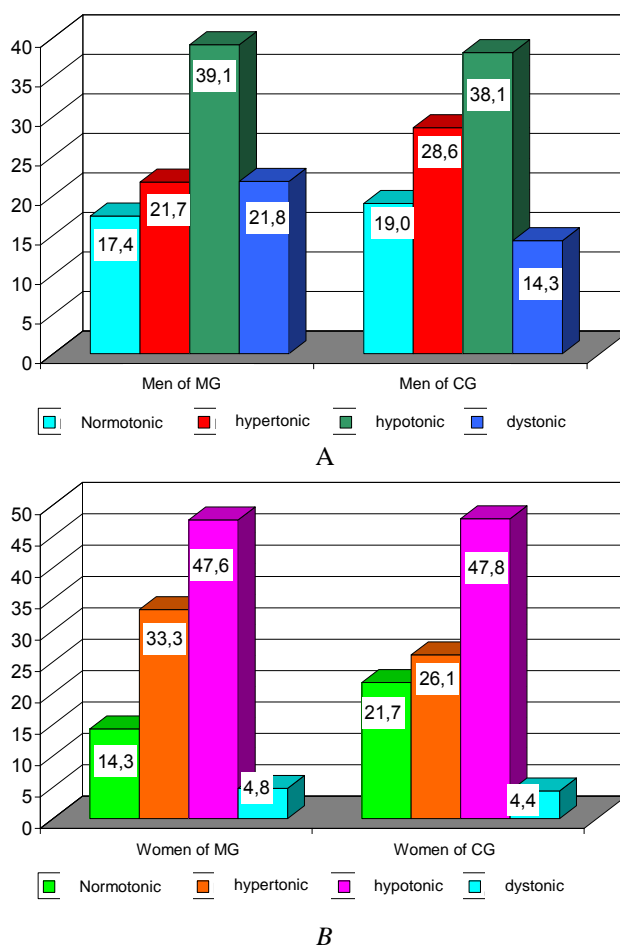


Fig. 1 type of cardio-vascular system's response to dozed physical loads at first examination of MG and CG patients (%): A –men; B – women

At in-patient stage of rehabilitation treatment, in main group, in complex of physical rehabilitation means we used therapeutic gymnastics, based on physical exercises with elements of yoga asanas, alternated by yoga breathing exercises, regulated breathing exercises, considering tonus of sympathetic and parasympathetic branches of patients' vegetative nervous system (the authors' methodic) [Patent 42604 Ukraine, MPK A61H1/00. Rehabilitation method for patients, suffering from infiltrative form of pulmonary tuberculosis/ Yu.S. Kalmykova, applicants and patent-owners: Kalmykova Yulia Sergiyivna (UA), Kalmykov Sergiy Andriyovych (UA) – № u20091816 від02.03.2009; published on 10.07.2009. Newsletter "Industrial Property" №13], dozed walking and autogenous training by I. Schultz's methodic, modified by V.S. Lobzine and M.M. Reshetnikov [2]. In control group program of physical rehabilitation, which

included therapeutic gymnastics (by methodic of V.N. Murza 1976, 2004) [3, 4], dozed walking and elements of psychological relaxing were used.

After three months of physical rehabilitation in main and control groups we could observe positive changes in adapting to physical loads (see fig. 2).

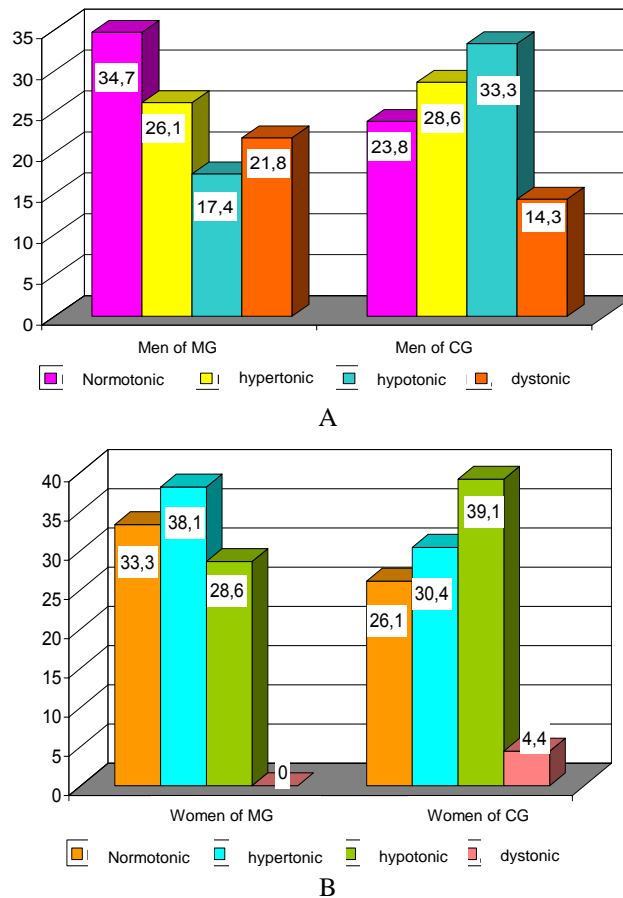


Fig. 2 type of cardio-vascular system's response to dozed physical loads at repeated examination of MG and CG patients (%): A –men; B – women

So, with repeated examination we observed increase of quantity of patients with normotonic type of response: MG men – up to 34.7%, control group men – up to 23.8%, MG women – up to 33.3%, control group women – up to 26.1%; decreasing of patients' quantity with hypotonic type of response : MG men – up to 17.4%, control group men – up to 33.3%, MG women – up to 28.6%, control group women – up to 39.1%.

Thus, with comparing results of first and repeated examinations of response type for dozed physical loads we observed increase of men with normotonic response type by 17.3% in main group and by 4.8% in control; increase of women in main group – by 19.0% and in control – by 4.4%. The quantity of men with hypotonic type of response reduced in main group by 21.7% and in control – by 4.8%; the quantity of women with hypotonic type of response reduced in main group by 19.0%, and in control – by 8.7%.

Summary

1. With pulmonary tuberculosis reduction of adapting abilities of cardio-vascular system is registered, that is manifested as presence of hypotonic, hypertonic and dystonic types of response to dozed physical loads, examined by Martinet-Kushelevskiy's test, and can be an aftereffect of intoxication syndrome with the given disease.

2. Physical training during three months result in improvement of adapting abilities of cardio-vascular system of the patients of this category.

3. Application of therapeutic gymnastics based on exercises with elements of yoga asanas, alternating with yoga breathing exercises; regulated breathing exercises, considering determination of tonus of sympathetic and parasympathetic branches of patients' vegetative nervous system (the authors' methodic), dozed walking and autogeneous training render more positive influence on adapting abilities of cardio-vascular system in comparison with program of physical rehabilitation, which included therapeutic gymnastics (by methodic of V.N. Murza 1976, 2004), dozed walking and elements of psychological relaxing that is witnessed by reduction of quantity of patients with atypical types of cardio-vascular system's response (hypotonic, hypertonic, dystonic) and by increasing of patients with normotonic type.

4. It is purposeful to study cardio-vascular system's adapting abilities of the patents of such category in order to correct and individualize physical loads.

The further prospects imply fulfillment of correlation analysis between the state of vegetative nervous system and cardio-vascular system's response to dozed physical loads with pulmonary tuberculosis, as well as influence of therapeutic physical culture on the studied indicators.

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Cite this article as: Kalmykov S.A., Kalmykova Yu.S. Features of the reaction of the cardiovascular system to physical exercise in patients with pulmonary tuberculosis. *Pedagogics, psychology, medical-biological problems of physical training and sports*, 2013, vol.4, pp. 26-29. doi:10.6084/m9.figshare.691012

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Received: 26.02.2013
Published: 30.04.2013