

AEROBIC EXERCISE IN REHABILITATION OF WOMEN SECOND COMING OF AGE WITH DIABETES MELLITUS TYPE 2 AT A POLYCLINIC STAGE RESTORATIVE TREATMENT

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Annotation. The aim of the study was to prove the efficacy of therapeutic walk in the rehabilitation of women with type 2 diabetes at a polyclinic stage. We examined 28 women with diabetes in an easy manner (age 50-56 years). In the control group rehabilitation of women was carried out using therapeutic exercises on background diet. In the main - also used a dosage walking. Found that physical rehabilitation helped reduce blood glucose levels and hypercholesterolemia patients, normalization of body weight. The heart rate of patients at rest decreased due to economizing and efficiency of blood circulation. Marked increase in the index of physical condition by Pirogov improved emotional state (based on psychological testing). All patients found an increase in physical performance, according to a sample Master and increased resistance to hypoxia. In the group with the additional use of therapeutic walk, the results of rehabilitation were more pronounced.

Keywords: hypoxia, hyperglycemia, pre-obese, aerobic performance, step - test.

Introduction

Insular diabetes (ID) is one of the most frequent endocrine human diseases, with which all kinds of metabolism become abnormal. It is considered that one of main reasons of cardio-vascular diseases and diabetes' prevalence in modern world is motionless style of life. Disability and mortality of people with insular diabetes is conditioned, mainly, by complications after cardio-vascular diseases (apoplexy, cardiac infarction, affection of peripheral arteries) [1, 5, 12, 13].

For persons with insular diabetes, besides diet, the main method of prophylaxis and treatment is health-improving physical exercises. Muscular activity, changing all blood circulation process, rising metabolism level in cardiac muscle, stimulates coronary circulation [3]. Nevertheless positive influence of physical activity on diabetes has not been studied sufficiently yet. That is why recent years this problem has been attracting attention of both: scientists and doctors-practitioners.

It is known that correctly dosed physical loads positively influence on all kinds of metabolism that permits to reduce sugar level in blood, increase quantity of insular receptors and their sensitivity to insulin, to reduce doses of insulin. Alongside with it it has been established that significant loads can cause sharp increase of glucose in blood. Response of persons with diabetes to physical load to large extent is determined by the degree of compensation of diabetes and by the value of physical load [8].

The most difficult task of rehabilitation is determination of the level of admissible loads from the point of view of their safety. It is necessary to consider the degree of dis-adapting of a patient and influence of medication preparations, which influences on hemo-dynamics [11].

In literature there are data about influence of physical loads' character on metabolic processes in organism's tissues. With quick exercises or those, which are carried out for short time, anaerobic processes prevail in muscles, which results in ketoacidosis and very insignificantly influence on glucose level in blood. Exercises, which involve large muscular groups in actions at slow or moderate rate, with significant quantity of repetitions, cause increasing of oxidation processes in muscles, owing to which not only glycogen is consumed but glucose from blood as well. Such kind of muscular activity is more suitable for patients with insular diabetes, because increase glucose consumption by muscles and its burning result in reduction of hyperglycemia. I.B. Temkin offered and clinically tested differentiated method of therapeutic gymnastic for patients with insular diabetes, depending on their age, complexity of disease and accompanying ailments [7, 10].

Success in rehabilitation of patients with insular diabetes depends on complex of the applied means, among which different forms of therapeutic physical exercises prevail in combination with physio-therapeutic methods and massage.

The research was carried out as per plan of scientific & research works of Tavrisheskiy national university, named after V.V. Vernadskiy.

Purpose, tasks of the work, material and methods

The purpose of the research is studying of efficiency of different rehabilitation programs for patients with insular diabetes of 2nd type at outpatient stage.

The tasks of the work:

1. To study dynamics of anthropometric, functional, bio-chemical and psychological indicators of patients of 2 groups under influence of rehabilitation course.
2. To evaluate rehabilitation potential of women of main and control groups before rehabilitation course and after it.
3. To compare effectiveness of rehabilitation programs in 2 groups.

The methods of the research.

The research was carried out on the base of 3-rd polyclinic complex of Simferopol, during 1 month. 28 women of 50-56 years old, with insular diabetes of 2nd type without accompanying pathologies, took part in the research

All patients were divided into 2 groups: main group (No1) and control (No.2). The groups were characterized by homogeneity of the studied indicators. Both groups received the same food and were treated by the same procedures of therapeutic gymnastics (TG). In main group additionally rehabilitation measures, with using of dose walking, were conducted.

The patients were observed during 30 days. Observation implied diagnosing of functional indicators of cardio-respiratory system, its response to physical load, control of body mass index, bio-chemical indicators of blood and psychological testing. Evaluation of physical level (IPL) was carried out by Ye.A. Pirogova [9]. For evaluation of tolerance to physical loads we used two-step test (Master's test), the height of a step was standard – 23 cm. Besides, we conducted breathing tests – Shtange's Genche's tests [4]. Bio-chemical study of lipid and carbon hydrate metabolism implied determination of glucose and cholesterol level of patients with ID. For evaluation of emotional state, self feeling and activity we used psychological testing (questionnaire CAH). Mathematical processing of the obtained results was fulfilled with the help of Student's t-criterion and as per T. White.

Means of rehabilitation:

At the beginning of physical rehabilitation course TG procedure took 20-25 minutes, TG training were conducted every other day. TG complex included exercises for relaxing, balance, coordination of movements, training of vestibular apparatus, breathing exercises. Isotonic (dynamic) loads were preferred [10]. Duration of therapeutic gymnastics training in the second half of the course was 30-35 minutes. Besides TG, for patients of both groups everyday morning exercises were recommended.

Dosed walking fulfilled in main group every other day, (alternating with TG) in the second half of day [2]. The first week, the tested covered distance of 1-2 km at rate of walking of 60 steps per minutes. Quantity of trainings – 3 times a week. Duration of a training – 24-29 minutes. During second week patients with hyper tension covered distance of 2-3 km. The rate of walking was the same – 60 steps per minute. The quantity of trainings increased up to 4 times a week. Duration of one training was 40 minutes. At the 3rd week distance was 3-4 km. It was offered to increase the rate of walking up to 70-75 steps per minute. In the 4th week the quantity of training rose up to 4 times a week. In the whole, load was selected, considering workability and self-feeling of women.

Physical loads in both groups were applied in both groups together with diet therapy (diet No.9).

Results of the researches

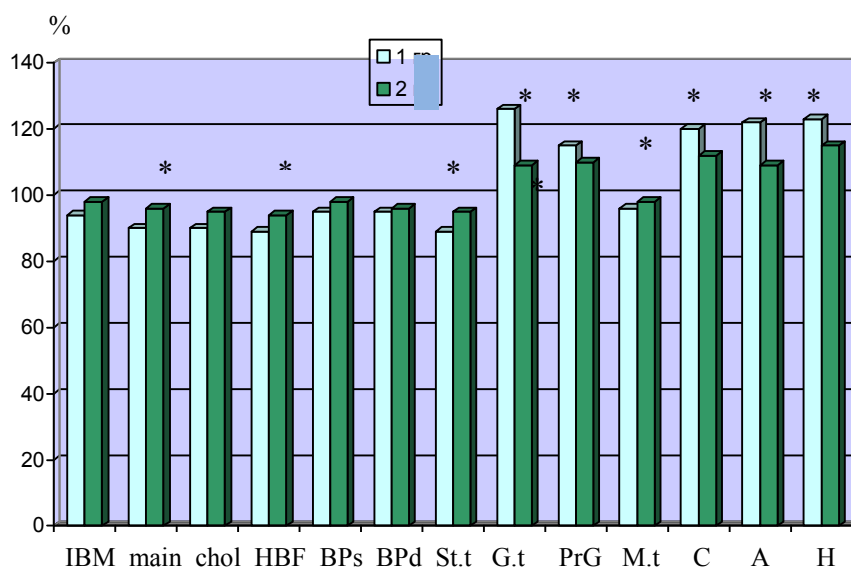
As thee conducted researches showed, the studied indicators of patients of both groups are comparable and confirm main diagnosis of patients –ID of light degree against the background of low health level, low physical workability and CAH level.

According to the obtained results, rehabilitation course facilitated reduction of initially excessive body mass in both groups, which was characterized as pre-obesity state. However, in main group it was expressed to the larger extent – by 3. 4% (p<0. 05), (IBM) – by 3. 7% (p>0. 05). Bio-chemical indicators of blood in both groups also improved: by level of glucose reduction in the main group was 10% (up to 6. 3 ±0, 2 mmole p. l.), in control – 4%; by cholesterol level – in the 1st group change by 9. 8% (до 5. 5 ± 0, 04 mmole p.l.), in the 2nd – by 4. 9%.

As examination of cardio-vascular system showed, at the beginning of rehabilitation BP of patients was characterized by increased level – “increased normal”. The level of somatic health of ID patients, by IPL was “lower than middle”. Indicators of cardio-vascular system normalized in both groups as a result of applied rehabilitation course. However, in main group these results are more expressive: HBF decreased nearly by 6% more than in control group (p<0. 05). After rehabilitation course IPL of patients approached to “middle”, and increasing of IPL of the 1st group's patients turned out to be confidently higher than of the 2nd group' patients by 5.6% 5, 6% (p<0, . 05).

The tests with breathing pauses showed increasing of stability to hypoxia of all women. However, Stage's test results in main group increased more than in the 2nd by 17% (p<0. 001), while Genche's test's results – by 5% (p<0. 05). As it was seen from step-test, HBF of sum maximal load of 1st group women before rehabilitation course was 165, 2±0. 4 b.p.m. After rehabilitation course this indicator reduced by 5. 5% (p<0. 001). Improvement of results of load tests in control group was 2%. Thus, initially low workability of ID patients approached to satisfactory level as a result of rehabilitation course.

Psychological testing witnesses that psycho-emotional level of both groups increased. With it self feeling of main group patients rose by 7. 9%, in comparison with the 2nd group (p<0. 01). Activity increased correspondingly by 10. 7%, mood – by 8. 8% (p<0, 001) (see fig.1



1- group 1; 2 – group 2.

Fig.1. Dynamics of functional indicators of control and main groups' patients with insular diabetes in the course of rehabilitation. Differences are confident.

Thus, in main group as a result of additional application of aerobic exercises – dosed walking- rather expressed compensatory changes of metabolic processes and hemo dynamic indicators took place, most of which became normal. Dosed walking is an effective method of correction of state of patients with ID of second type.

Summary

1. Complex application of physical rehabilitation means (TG, diet therapy) facilitated improvement of metabolic processes, condition of cardio-vascular system and adapting abilities and psycho-emotional state of both groups' patients.
2. Additional application of dosed walking in main group significantly increased effectiveness of rehabilitation process.
3. Thus, application of dosed walking in rehabilitation of women with insular diabetes proved its efficiency and can be recommended for implementation in practice.

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