



Science, Movement and Health, Vol. XVI, ISSUE 2 Supplement, 2016  
September 2016, 16 (2, Supplement): 412-417

Original article

## THE IMPORTANCE OF KINESIOTHERAPY IN THE TREATMENT AND PROPHYLAXIS OF HYPERTENSION IN ADULTS

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### Abstract\*

*Aim.* Hypertension (HTN) represents the increase in systolic and / or diastolic blood pressure over 140 mm/Hg, respectively 90 mm / Hg. Hypertension determines the increment of the heart activity and may lead to damage in blood vessels and other organs, especially the kidneys, the heart and the eyes. Hypertension therapeutics aims to decrease the blood pressure by influencing some of the mechanisms regulating it, to combat the risk factors, to stop the progress of the disease and to prevent complications.

*The objectives of the research are:*

- to set the optimum exercises within the kinetic program applied according to the subjects' condition (evolutional, etiopathogenic context),
- to set the indications and the contraindications of the application of the kinetic program within the complex medical care (medication, physical, kinetic) of the patient.

Research methods used:

Literature analysis method

Interlocution method

Observation method

Case study method

Tests method

Experimental method

Hypothesis

The paper aims to demonstrate whether or not the kinetic program proposed contributes to optimizing the hypertension recovery and the life quality in patients with cardiac pathology.

The research was performed on two groups: experimental and control each with 10 subjects, with a minimum age of 41 years and maximum 66 years; this allows us to conclude that the experimental group is homogenous in terms of age.

The evaluation of patients with hypertension required a thorough medical history, a complete clinical examination, highlighting both the changes that hypertension has on the cardiovascular system and a full set of laboratory and imaging exploration.

The research was performed on two groups, experimental group and control group, each one having 10 subjects, minimum age of 41 years old and maximum age of 66 years old, this allows us to conclude that the experimental group is homogenous in terms of age.

The assessment of the hypertensive patient assumed a thorough anamnesis, a complete clinical examination, highlighting both the changes that hypertension has on the cardiovascular system as well as a full set of laboratory and imaging exploration.

There were assessed:

- the degree of occurrence of headaches
- the degree of fatigue manifested by subjects
- the degree of dizziness
- the degree of reduction of hypertension

*Conclusions.* The kinetic treatment had favorable results in reducing fatigue, dizziness as well as in reducing the value of diastolic and systolic blood pressure and in increasing life quality.

*Keywords:* hypertension, prophylaxis, kinesiotherapy, disease, recovery

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Received 12.03.2016 / Accepted 03.04.2016

\* the abstract was published in the 16<sup>th</sup> L.S.C. "Perspectives in Physical Education and Sport" - Ovidius University of Constanta, May 20-21, 2016, Romania



## Introduction

The recovery of cardiovascular patients was introduced in Romania in the early 1970s, particularly for patients with coronary heart disease. Nowadays, the interest in the recovery of cardiovascular patients has increased worldwide. (Zdrenghea, 1995)

Hypertension (HTN) represents the increase in systolic and / or diastolic blood pressure over 140 mm/Hg, respectively 90 mm / Hg. Hypertension determines the increment of the heart activity and may lead to damage in blood vessels and other organs, especially the kidneys, the heart and the eyes. The cause of HTN may be known or secondary to other diseases. (Buşneag, 2006).

Normal values of blood pressure until the age of 40 must be inferior to 140/90 mm Hg, until the age of 60, inferior to 150/90 mm Hg, and over the age of 60, inferior to 160/90 mm Hg. Between normal blood pressure and hypertension there is the so called border hypertension or limit hypertension.

In our country, the prevalence of hypertension amounts to 10-15% of the adult population, which means over two million hypertensive persons in various stages of evolution (Mogoş, 1990).

Hypertension therapeutics aims to decrease blood pressure values by influencing some of its regulating mechanisms, to decrease the blood pressure by influencing some of the mechanisms regulating it, to combat the risk factors, to stop the progress of the disease and to prevent complications.

In this regard, physical training has a place that deserves attention within the therapeutic arsenal of essential hypertension. (Obrascu, 1986).

The methodology depends on the evolution phase of the disease, on the effort capacity and functional state of the patient, on the setting of the indications and contraindications regarding the means used (Drăgan, 1981).

During physical activity, different tissues and organs share the need for additional blood flow. The cardiovascular system is one of the most solicited compartments during effort the heart must ensure blood both for the contraction of its own muscle and for the contraction of the skeletal muscles.

Physical effort determines a series of acute (immediate) and chronic (late or training) adaptation at the level of the cardio-vascular apparatus (Ciucurel, 2008).

Aerobic exercise program must include three important moments:

- The moment of preparation of the body for effort
- The fundamental part of proper training
- The moment of recovery of the body after the effort (Şerban, 2002)

The objectives of the research are:

- to set the optimum exercises within the kinetic program applied according to the subjects' condition (evolutional, etiopathogenic context),
- to set the indications and the contraindications of the application of the kinetic program within the complex medical assistance (medication, physical, kinetic) of the patient,
- to set the optimum number of recovery sessions,
- to set the optimum period to apply the therapy following which the improvement of clinical symptomatology in these patients is obtained,
- kinetic program to compile the patient will have to follow at home in going to a regime relatively normal life and work.
- to compile the kinetic program that the patient shall attend at home under the conditions of a relatively normal life and work regime.

Tasks of the research

1. Setting of the optimum physical exercises within the kinetic program, considering the phases and the evolution of the patient's condition.
2. Setting the number of repetitions, of the series and the duration of the recovery program.
3. The bibliographic study on the relationship between the causes of hypertension
4. Study of the references related to the research methodology in the hypertension recovery activities, keeping the evaluation instruments suitable to be used in kinetic programs.

Hypotheses

1. The paper aims to demonstrate whether the kinetic program proposed contributes to optimizing the hypertension recovery and the life quality in patients with cardiac pathology.
2. The complete clinical and functional evaluation of the heart, within the assessment of the general clinical and functional status of the patient, contributes to a more efficient recovery of subjects suffering from hypertension.

Research methods used

- Literature analysis method
- Interlocution method
- Observation method
- Case study method
- Tests method
- Experimental method



Carry out of the experiment

The experiment in this research was performed on an experimental group consisting of 10 subjects both men and women, representing hypertension in different stages.

This study was deployed considering the following stages:

1. Presentation of the cases.
2. Analysis of the medical charts – personal data; - specific aspects.
3. Initial test of each subject in the experimental group.
4. Elaboration of a kinesiotherapeutic program.
5. Proper recovery.
6. Final test.
7. Comparative analysis of the initial and final results.
8. Conclusions.

Before beginning the kinesiotherapeutic program, the initial tests shall be performed, during the program, and the most important ones, the final tests in order to see the efficiency of the kinetic program was.

**Presentation of experimental samples**

The research was performed on two groups, experimental group and control group, each one having 10 subjects, minimum age of 41 years old and maximum age of 66 years old, this allows us to conclude that the experimental group is homogenous in terms of age.

*Group 1 (experimental)* consisting of 10 subjects aged between 41-66 years old that undertook a recovery program using kinetic exercises.

*Group 2 (control)* consisting of 10 subjects aged between 41-66 years old that used as main recovery mean pharmaceutical treatment

The research started with a documentation period that envisaged hypertension recovery modalities. First, the construction of the groups implied in the experiment was performed.

For the making-up of the two groups, the starting point was the similarity as close as possible of the experimental group characteristics with the subjects of the control group, in terms of age, anthropometry and functionality.

The subjects from both samples having pathological family medical history and personal medical history were excluded, and reporting the existence of other current health issues; only those referring to shoulder traumatology were received in the experiment.

All these selection criteria of the subjects of the experiment were used in order to decrease as

much as possible the action of parasite, undesired variables, and in order to make a more efficient kinetic program.

Two tests were used for the experimental group: the first test was carried out at the beginning of the experiment with evaluative purposes, the second test, the final test offers the conclusions of the application of the kinetic program on the experimental group. Test intervals were chosen in accordance with the theoretical data identified in literature. Following the determinations made, we expect to find some positive evolution in stabilizing hypertension. For the control group, two tests were conducted (initial and final), using the same methodology of data collection.

**Results of the research and their interpretation**

The evaluation of patients with hypertension assumed a thorough medical history, a complete clinical examination, highlighting both the changes that hypertension has on the cardiovascular system and a full set of laboratory and imaging exploration.

The following were assessed:

- > the degree of occurrence of headaches
- > the degree of fatigue manifested by subjects
- > the degree of dizziness
- > the degree of reduction of hypertension

1.The test regarding the degree of occurrence of headaches was conducted by means of an evaluation scale represented by:

- > mild pain – 1<sup>st</sup> degree
- > average pain – 2<sup>nd</sup> degree
- > severe pain – 3<sup>rd</sup> degree

At the initial test, 4 cases from the experimental group accused 3<sup>rd</sup> level pain and 4 cases 2<sup>nd</sup> level pain, and 2 cases accused 1<sup>st</sup> level pain.

Subject	1	2	3	4	5
Initial result	2 <sup>nd</sup> degree pain	1 <sup>st</sup> degree pain	3 <sup>rd</sup> degree pain	3 <sup>rd</sup> degree pain	2 <sup>nd</sup> degree pain
Final result	1 <sup>st</sup> degree pain	0 degree pain	1 <sup>st</sup> degree pain	1 <sup>st</sup> degree pain	0 degree pain

Subject	6	7	8	9	10
Initial result	3 <sup>rd</sup> degree pain	1 <sup>st</sup> degree pain	2 <sup>nd</sup> degree pain	2 <sup>nd</sup> degree pain	3 <sup>rd</sup> degree pain
Final result	1 <sup>st</sup> degree pain	0 degree pain	1 <sup>st</sup> degree pain	1 <sup>st</sup> degree pain	1 <sup>st</sup> degree pain

At the final test, the following results were registered:

- 7 cases 1<sup>st</sup> level
- 3 cases 0 level

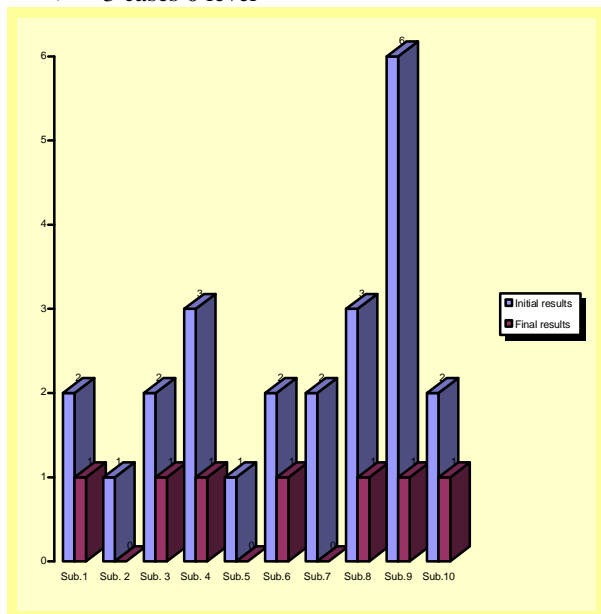


Fig.1. – Comparative analysis of the results (initial-final) at the evaluation of headache

2. The second testing parameter at the experimental group was the occurrence of fatigue. This was conducted by means of an evaluation scale represented by:

- mild fatigue – 1<sup>st</sup> grade
- medium fatigue – 2<sup>nd</sup> degree
- severe fatigue – 3<sup>rd</sup> degree

The following results were obtained:

At the initial test, 5 cases from the experimental group presented 2<sup>nd</sup> degree fatigue and the same number of cases 3<sup>rd</sup> degree fatigue.

Subject	1	2	3	4	5
Initial result	2 <sup>nd</sup> degree fatigue	3 <sup>rd</sup> degree fatigue	2 <sup>nd</sup> degree fatigue	2 <sup>nd</sup> degree fatigue	2 <sup>nd</sup> degree fatigue
Final result	0 degree fatigue	2 <sup>nd</sup> degree fatigue	1 <sup>st</sup> degree fatigue	1 <sup>st</sup> degree fatigue	1 <sup>st</sup> degree fatigue

Subject	6	7	8	9	10
Initial result	3 <sup>rd</sup> degree fatigue	3 <sup>rd</sup> degree fatigue	2 <sup>nd</sup> degree fatigue	3 <sup>rd</sup> degree fatigue	3 <sup>rd</sup> degree fatigue
Final result	2 <sup>nd</sup> degree fatigue	1 <sup>st</sup> degree fatigue	1 <sup>st</sup> degree fatigue	1 <sup>st</sup> degree fatigue	2 <sup>nd</sup> degree fatigue

At the final test, the following results were registered:

- 6 cases 1<sup>st</sup> degree fatigue

- 3 cases 2<sup>nd</sup> degree fatigue
- 1 case 0 degree fatigue

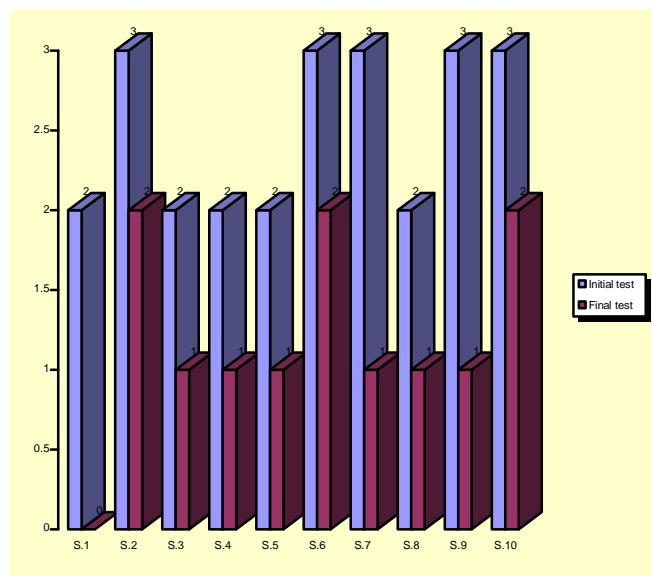


Fig.2. - Comparative analysis of the results (initial-final) at the evaluation of the degree of fatigue

3. The third parameter referred to the degree of dizziness occurrence in hypertensive patients. This was conducted by means of an evaluation scale represented by:

- Mild dizziness – 1<sup>st</sup> degree
- Accentuated dizziness – 2<sup>nd</sup> degree

The following results were registered:

At the initial test, 6 cases from the experimental group registered an accentuated dizziness threshold and 4 cases mild dizziness.

Subject	1	2	3	4	5
Initial result	2 <sup>nd</sup> degree	1 <sup>st</sup> degree	1 <sup>st</sup> degree	2 <sup>nd</sup> degree	2 <sup>nd</sup> degree
Final result	0 degree	0 degree	0 degree	1 <sup>st</sup> degree	1 <sup>st</sup> degree

Subject	6	7	8	9	10
Initial result	2 <sup>nd</sup> degree	2 <sup>nd</sup> degree	2 <sup>nd</sup> degree	1 <sup>st</sup> degree	1 <sup>st</sup> degree
Final result	1 <sup>st</sup> degree	0 degree	1 <sup>st</sup> degree	0 degree	1 <sup>st</sup> degree

At the final test, the following results were registered:

- 5 cases 0 dizziness
- 5 cases 1<sup>st</sup> degree dizziness

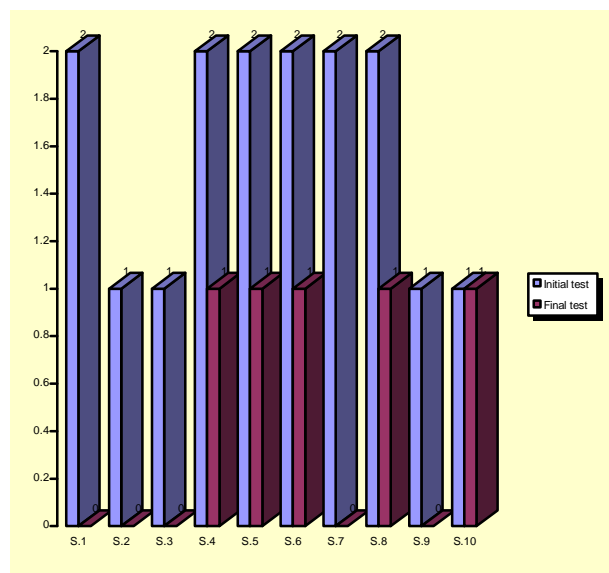


Fig.3. - Comparative analysis of the results (initial-final)

**at the evaluation of the degree of dizziness**

4. Regarding the hypertension after the kinetic program, the following results were obtained:

Subject	1	2	3	4	5
Initial result	15/9 mm/Hg	16/11 mm/Hg	14,5/9,5 mm/hg	17/11,5 mm/Hg	15,5/9,5 mm/Hg
Final result	13/7 mm/Hg	14/9 mm/Hg	12,5/7,5 mm/Hg	15/10 mm/Hg	14/8 mm/Hg

Subject	6	7	8	9	10
Initial result	14,5/9 mm/Hg	18/11 mm/Hg	18/11 mm/Hg	15/9 mm/Hg	16/10 mm/Hg
Final result	12,5/8 mm/Hg	16/10 mm/Hg	15,5/10 mm/Hg	13/7 mm/Hg	14/8 mm/Hg

The results obtained were:

- subjects 1 and 2 decrease in blood pressure with two units both in the case of diastolic blood pressure and systolic blood pressure
- subject 3 with two units both in the case of diastolic blood pressure and systolic blood pressure
- subject 4 with two units in the case of diastolic blood pressure and 1 and a half unit in the case of systolic blood pressure
- subject 5 one and a half unit systole and diastole,
- subjects 6 and 7 two units in the case of systolic blood pressure and one unit in the case of diastolic blood pressure,

- subject 8 two and a half units in the case of systolic blood pressure and one unit in the case of diastolic blood pressure
- subjects 9 and 10 two units in the case of systolic blood pressure and two units in the case of diastolic blood pressure.

**Discussions**

Tătaru (2011) in his doctoral thesis "Prospective study of hypertension in children and adolescents in Iasi" performs an experiment regarding the incidence of hypertension in children and teenagers from schools and high-schools in Iasi Municipality and Codlea city, cities with different socio-economic standards.

In the doctoral thesis "Genetic implications of atherosclerosis and hypertension in middle-aged and elderly patients," Popa (2014) performed an experiment regarding the genetic predisposition of individuals subject to hypertension, as well as the need to include in the medical practice some prophylaxis strategies that contribute decisively to the development of customized strategies based on the patient's clinical and family profile, that will be available to be used in medical practice.

Lozincă (2009) in the book "Kinetotherapy in cardiovascular diseases" provides a brief description of cardiovascular diseases which can be healed or improved with the help of kinetotherapy as well as a systematization of the kinetic means and objectives used in hypertension recovery.

**Conclusions**

1. The accurate and complete assessment of cardiovascular pathology, of the functional status due to hypertension represents an important component in the kinetic program, for this purpose being highlighted the need to use standardized scales by means of which the registered progresses can be evolutionary compared and quantified.
2. By means of the kinetic programs used there was a decrease in headache, in all subjects, at all evaluation points, with the clarification that the reduction of the parameter pain was significant regardless of gender and age of the patients.
3. The kinetic treatment had a favorable effect in reducing fatigue, dizziness and in reducing the value of diastolic and systolic blood pressure and in increasing the quality of life.
4. By the results obtained, we managed to underline the role of the physiotherapist in the assessment and functional recovery of the consequences due to hypertension-induced suffering with the purpose of



substantiating the kinetic objectives, methods and means within the complex functional rehabilitation program.

5. The assiduity in systematically practicing the kinetherapy program with special exercises contributes to the efficient recovery of hypertension.

#### **Aknowledgements**

We thanks to all our participants and subjects in this study.

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