

THE ROLE OF KINETOTHERAPY IN RECOVERING HYPERLORDOSIS

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Abstract: *The paper presents kinesiology techniques of recovering hyperlordosis. We have considered that, by respecting the general principles and by efficiently using the kinesiology techniques of recovering the physical deficiencies with the help of kinetic means, it will come to a normal alignment of the body, to a recuperation of amplitude of movement and development of force and muscular resistance of the spine. The scientific argument is presented by the kinetic techniques, the content of specific means of improving the spine's physical deficiencies, which, by ensuring an optimal relationship between the specific and non specific means of kinetotherapy, contribute to treating the spine's physical deficiencies in the antero-posterior plane. To highlight the usage of kinetic techniques with the help of specific means in recovering the spine's physical deficiencies, one has organized an experiment, within the Astra Municipal Hospital from Brasov. The study was done on a period of 6 months, in which 2 weekly sessions have been done, on a number of 12 subjects, and in the present article we present the results of a single subject, age 15. The study highlights the applied kinetic program, built from static exercises, as correct, corrective and hyper corrective positions of the spine and dynamic exercises adapted to the degree of deficiency and their anatomical and physiological characteristics, thus improving both the functioning of the myo-artho-kinetic apparatus and the whole organism. From the analysis of the content of specific means of kinetotherapy in recovering muscular and articular force at the level of the spine, we can notice the recuperation of amplitude of movement and the development of force and muscular resistance of the spine.*

Key words: *kinetotherapy, recovering hyperlordosis.*

1. Introduction

In recent years, kinetotherapy has become a very well known domain, highly appreciated by the people who needed a certain treatment for improving different physical deficiencies. Kinesiology represents the science that studies the

movement of living organisms and the participant structures to this movement. Medical kinesiology or kinetotherapy studies the neuromuscular mechanisms respectively the articular ones that ensure the individual's normal motile activities. The latter is part of physical medicine – therapeutic specialty which uses methods

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such as: movement, heat, electricity, climate, massage and water. Medical kinesiology is the newest component of physical medicine and represents the basic active methodology for recovering or improving the functions of some parts of the human body affected by disease or traumas [2, p. 10-17]. Physical deficiencies are those aberrations from the norm of the human body which by disturbing the harmonious development modify the exterior aspect and reduce the individual's skills as well as his organism's power to adapt to the environment, loosing also the ability to maintain a constant work flow [5, p. 19], [6]. Treating these aberrations is highly important for otherwise they can cause serious alterations of the body, determining high dysfunctional problems which affect the individual's degree of independence making it difficult to lead a normal day to day life [1], [3, 60-64].

The purpose of the paper was establishing a recovery program, as well as applying this program in the recovery treatment of lumbar hyperlordosis, bearing in minds the lumbar spine and the other curves, cervical and thoracic that require correct posture during the kinetic program, avoiding their accentuation.

The hypothesis of the research

One establishes the premise that the kinetotherapeutic treatment through its selected means and methods according to the patient particularities, manages to correct or even stop the advancement of hyperlordosis, physical deficiency with repercussions on the individual's health.

The tasks of the research

- Selecting the most adequate methods and means of treatment: kinetotherapy, electrotherapy, massage;
- Individualizing the kinetotherapy programs according to: age, sex, disease,

patient's physical possibilities, local aberrations of the spine or of other segments of the body

- General somatoscopic evaluation;
- Evaluating the muscular balance;
- Evaluating the articular balance.

2. Material and methods

In the effectuated research we have used varied methods of analysis keeping in mind that fact that if information come on different channels the obtained results lead to a more real final conclusion. Thus we have used the following methods of research:

- The bibliographical method: we have studied the specialty literature and we have documented the data with the purpose of obtaining as much information as possible related to the studied theme. The attached bibliography presents the sources of information used for the theoretical ground of the paper.
- The investigation method: we have obtained necessary data and information for knowing patients, for the evolution of the disease, for the factors that have generated the affliction.
- The case study method: we have done this during the program of kinetotherapy and the patients' observation charts in a kinetotherapy cabinet of the Municipal Hospital in Brasov. The purpose of this method was determining the unique characteristics of the patient and the disease.

The effectuated trials and tests

Within the methods of evaluation the following have been effectuated:

The somatoscopic exam had the purpose of tracking down the body's deficiencies through visual examination.

The somatoscopic examination comprised:

a. General somatoscopy which followed tracking down physical deficiencies while examining stature, weight, height, tegument and nails (color, consistency, elasticity), the adipose and fibrous hypodermal tissue (examined from the distribution point of view in terms of body regions, quantity and consistency), thoracic perimeter and elasticity, frequency, breathing type and rhythm [7, p. 104-109].

b. Regional somatoscopy consisted of examining the morpho-functional characters of the body region as follows: head, neck, trunk, thorax, abdomen, superior limbs, back, basin, inferior limbs.

1. The Schöber evaluation method: it is a method that evaluates the spine's mobility. The procedure is done with the patient in orthostatism, the examiner marking with a horizontal line the level of apophysis L5. One measures 10 cm high signing this point with a horizontal line parallel to the first [4]. The patient is asked to execute a minimal flexion of the trunk, thus the distance between the two points needing another measurement. Normally, the value from L5 and the 10 cm point must increase with approximately 5 cm. if the distance presents a value lower than 4,5

cm it is considered an abatement of the lumbar mobility, a lordosis that has surpassed the attitude stage [9, p. 605-607].

2. The finger-soil test: consists of measuring the distance between the patient's fingers and soil as follows: in orthostatism with the knees in extension, the legs close together, with a maximum flexion trying to reach the soil with the hands. The examiner measures the possible distances remained between the fingers and the ground. The maximum value will be appointed as follows:

The research was done on a period of 6 months. Due to the fact that lumbar hyperlordosis is very frequent in adolescence, as a result of the growth process, from the 12 subjects effectuating the program of improving hyperlordosis, in the paper in cause, are presented the results of a single patient of 15 years old. The duration of a kinetotherapy session was 40 minutes, 2 weekly sessions.

The means, objectives and methods of the recovery program

The objectives of the recovery program

The objectives of the recovery program have been established according to the clinical forms of lordosis: painful and not painful.

Table 1

Touching the soil with the palms	10 points
Touching the soil with the fingers	8 points
Touching the soil with the tip of the fingers	6 points
A distance of under 2 cm between fingers and soil	5 points
A distance of 3-5 cm between fingers and soil	4 points
A distance of 6-10 cm between fingers and soil	3 points
A distance of 11-15cm between fingers and soil	2 points
A distance of more than 15 cm	1 point

Thus, the main objectives of the recovery treatment have been:

1. Tracking down the causes that favor the apparition of lordosis and dissolving them;
2. Controlling the inflammation and pain;
3. Correcting the lumbar spine using exercises for invigorating the short abdominal muscularity and invigorating/rebalancing the elongated lumbosacral muscularity.
4. Forming the reflex of correct posture, acknowledging the correct posture of the spine and basin in static and dynamic positions.
5. Reeducating the diaphragmatic breathing giving the fact that the diaphragm muscle has a lordosis effect.
6. Correcting the eventual physical deficiencies from the inferior limb level and trunk.
7. Preventing the apparition of secondary kyphosis with compensatory character.
8. Fighting off the muscular-ligament imbalances
9. Preparing the organism for an orthopedic and surgical treatment [8].
10. The applied treatment during the study has been constructed mainly on kinetherapeutic methods using static exercises such as correct, corrective and hyper corrective postures of the spines and dynamic exercises.

The exercises have been adequate for every patient, adapted according to the degree of deficiency and its anatomical and physiological characteristics, thus improving both the proper functioning of the myo-ortho-kinetic apparatus and the whole organism.

Physical exercise program for correcting lordosis

The treatment through physical exercises has been done by respecting the following 3 stages:

I. *Within the first stage the patient* was confronted with his physical spine deficiencies. He acknowledged the importance of recovery, the necessity of postural reeducation. This first stage had 6-8 sessions giving the importance of apprising the patient with his own experience the irregularity and the necessity of the treatment.

With this purpose the majority of exercises from the initial stage were done in front of a mirror, in orthostatism with the back against the wall or in dorsal bedsores on a hard platform.

Postural exercises:

1. In front of a mirror: the patient pulls abdominally, contracts the gluteal muscles, having a correct position of the lumbar spine. The position is maintained 5 seconds with a 3 seconds break.
2. In orthostatism, with the back against the wall, the body being in contact with the wall at the level of heels, occipitus and glutes. The patient maintains the position for 10-15 seconds with a 5 seconds break.
3. From the dorsal bedsores with the bended knees, the abdominal muscularity contracts along with the slight ascending of the tip of the coccyx.
4. The quadruped position, the patient executes movements of rocking the basin contracting the abdominal muscles, lowering the sitting on heels.
5. Dorsal bedsores with flexed knees at 90° while pressing the lumbar area on the soil. Maintaining the position

for 10 seconds with a relaxation period of 5 seconds before resuming the exercise.

II. *The second stage* represents the corrective stage where correction and invigorating exercises have been effectuated due to which posture has improved. After the muscular invigoration from the alteration level we have moved to the generalized invigoration of the limb and trunk muscularity. This stage took 2-3 months with 2 weekly sessions in the kinetotherapy room and daily at home with the studied methods.

Correction exercises:

1. From orthostatism, walking with the bending trunk, the left pace is accompanied by the bending and rotation of the trunk in the same side, together with balancing the limbs to the left. The movement is done on the right side as well.
2. Standing aloof facing the fixed ladder, the hands grab the grade from the basin level, the subject flexing the trunk at 90°. He maintains the position 10 seconds after which comes back to the initial one.
3. Ventral bed sore on a medicinal ball with the superior and inferior limbs all stretched out, the patient supporting himself on his hands and the tip of his legs.
4. From dorsal bed sore, with flexed knees, the superior limbs along the body, the patient reaches his right heel with his right superior limb and the left one with the left superior one. The patient slowly raises his head from the soil during the movement. The exercise resumes 10 times on each side.
5. Dorsal bed sore with flexed knees, grabbing the knees with both hands

and pulling them towards the chest. It maintains the posture for 10 seconds at maximum position following a relaxation with the soles on the ground.

Invigorating exercises:

1. From sitting with the knees in extension, the subject pulls his abdomen by slowly lifting his right inferior limb, then the left one.
2. The position: on the knees with support on the palms. Mobility: lifting the knees from the ground while flexing the trunk and extending the knees. The legs must be well stretched from the knees. Maintaining the position for 15 seconds with knee flexion.
3. The subject in dorsal bed sore, with the legs fixed on the last level of the hedgerow, hands on the cervix, flexing the trunk at a vertical.
4. From dorsal bed sore the hands catch the popliteal spaces of the flexed knees while pulling towards the chest. The subject flexes the head executing the body's rolling on the spine.
5. From a ventral bed sore on a table, with a sack of sand under the abdominal region, the subject holds from the side of the table, lifts both stretched legs from the knees under the horizontal line, avoiding thus the lordosis and coming back to the initial position.
6. From dorsal bed sore, detrusion with the stretched inferior limbs.

III. *The final stage* represents the stage in which the patient fixes his obtained results as to readapt and atomize the correct position both during exercises and daily life.

This stage is based on postural and correction exercises with a very intense generalized muscular activity. The

exercises used contribute to the development of resistance necessary to regular day to day activity.

Presenting the research data

The patient, age 15, has been diagnosed with lumbar hyperlordosis, spina bifida occulta.

Symptoms: sensation of constriction in the lung area, feeling of suffocation, back pains, blockage while bending over, fatigue while walking for a long period of time. As a result of the radiological examination, one has showed that the patient had spina bifida occulta and hyperlordosis in the lumbar area.

The somatoscopic exam in the beginning of the treatment:

Nutritional state: normal weight.

Sagittal plane examination: the exaggerated bending of the basin towards the anterior, accentuating the spine curve in the lumbar area.

Frontal plane examination: the obtusion of the abdomen and the gluteal area.

The somatoscopic examination at the end of the treatment (figure1)

Nutritional state: normal weight.

Sagittal plane examination: reducing the spine curve at the lumbar area, lifting the basin. Frontal plane examination: withdrawing the abdomen and glutes due to the invigoration of the muscularity.

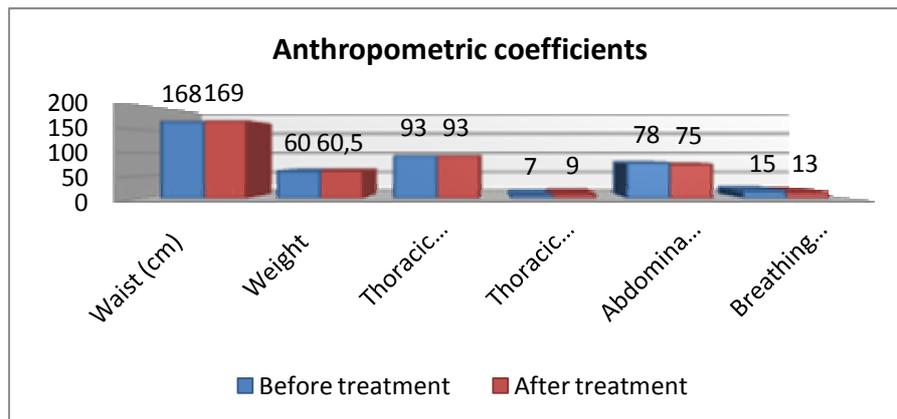


Fig. 1. *Anthropometric coefficients*

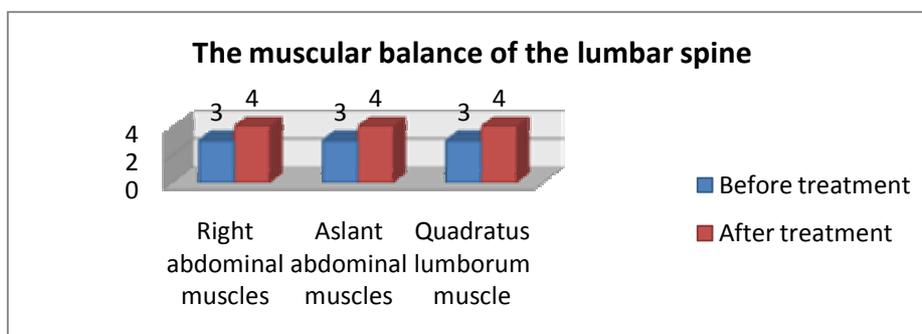


Fig. 2. *The muscular balance of the lumbar spine*

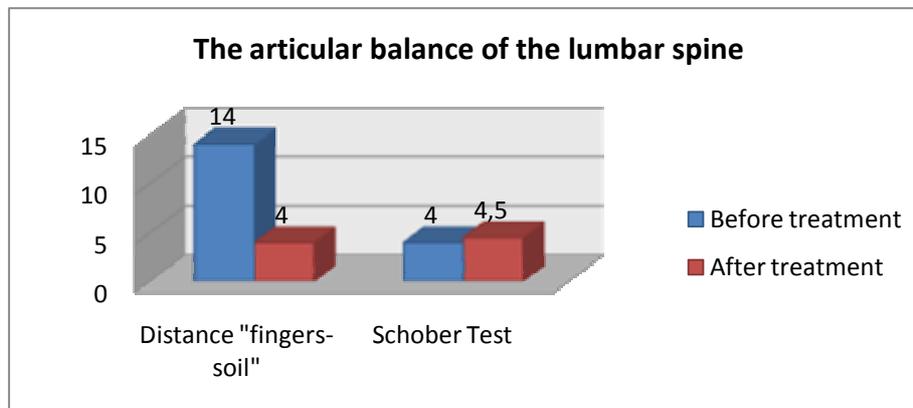


Fig. 3. *The articular balance of the lumbar spine*

As a result of effectuating the kinetotherapy program, one has noticed the following: increase of the waist by 1 cm, the increase of the thoracic elasticity, the decrease of the abdominal perimeter by invigorating the muscularity and improving the breathing function. As a result of the kinetherapeutic treatment one has noticed an increase of the muscular force for each and every muscle. The articular balance (figure 3) presents a conspicuous difference of 10 cm, while at the Schöber test of 0,5 cm. in the case of the patient presented in the paper, one has noticed a visible improvement of lordosis, an increase of muscular force and articular mobility, managing to obtain a correct attitude reflex both during static and dynamic activities.

The applied program, regardless of age, cause of degree of alteration, has lead to: the diminishing of the lumbar curve exaggeration; the recovery of the basin; the improvement and the disappearance of pains; the creation of an adequate attitude tonus. Besides kinetotherapy sports that oblige to kyphosis of the spine have been indicated such as cycling and swimming, as well as rest in the sitting position or in dorsal bedsores with flexed knees.

As a recommendation, one shall avoid the trunk extensions that lordose the

lumbar spine, orthostatism, prolonged walking and transporting weights.

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