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EFFECTIVENESS OF KINETIC TREATMENT OF OSTEOPOROSIS

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Abstract: *The main purpose we want to highlight in this study is the treatment of the recovery of osteoporosis by kinetic means, investigations used to put diagnosis, the effectiveness of its treatment, and awareness of the importance of physical therapy in this condition. In order to carry out this work we left the hypothesis that by using physiotherapy and means of physical therapy we will have positive effects in the case of recovery of the patient with osteoporosis. In conclusion, I can say that I was able to show how effective the recovery treatment for osteoporosis is and that this condition can be improved and stopped with the help of physical therapy and physiotherapy, preventing the appearance of fractures.*

Key words: *Osteoporosis, disease, physical therapy*

1. Introduction

Osteoporosis possesses a danger to most people, usually around the age of 40. This disease has also reached epidemic proportions in North America and Western Europe, and in the UK one in three and one of twelve men risks osteoporosis during her life [5]. More specifically, the risk of having a fractured hip due to osteoporosis is higher than that of the occurrence of breast, ovaries and uterus cancer taken together, with a 20% probability of death in the first year. Osteoporosis can mean long periods of pain, deformities generating infirmity due to rupture or crumbling of bones [1], [2].

This work aims both to know the peculiarities of osteoporosis, the ways of prevention and treatment, and to raise awareness of their importance. The more the ways of preventing the condition are taken into account; the risk of being diagnosed with it considerably diminishes. The same principle applies to its treatment. Knowing the main ways of treating leads to the best decisions in this regard [3].

The definition that "osteoporosis is a systemic disorder of the skeleton, which is characterized by decreased density and bone mass, presenting a deterioration of the microarchitecture of bone tissue, leading to an increase in as well as

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susceptibility to fractures" is the most recent, but also unanimously accepted of the condition.

As a problem of global importance, osteoporosis has been placed internationally in the list of diseases related to the ageing population. Increased frequency of osteoporosis in the last decade is observed [6], [7].

The social importance of the condition is appreciated from the perspective of its consequences: vertebral fractures and in the bones of the peripheral skeleton, makes the increase in disease, invalidation and mortality of people of an advanced age [8].

Every year, about 200 million people are diagnosed with osteoporosis worldwide. Also, most of them are women. One in three women over the age of 60 and two out of three women over the age of 80 are believed to be diagnosed with osteoporosis. In fact, only 50% of cases are diagnosed and less than 25% of patients receive appropriate treatment.

As for the *symptomatology of osteoporosis*, usually the affected persons present themselves for the appearance of pain. Most of the time, algic simptomas are located in the lower dorsal area, less often in the lumbar area, being the result of compressions that are caused by either fractures or vertebral collapses. Pain can also be felt in other regions, such as the femur, basin, and distal extremity of the radius or humerus. It is usually associated with other signs, namely symptoms of fractures, which occur from moderate trauma. Pain, being accompanied by a compressive fracture is usually sudden [4].

2. Material and Method

In order to carry out this work we left the following hypothesis: by using physiotherapy and means of physical therapy we will have positive effects in the case of osteoporosis**.**

2.1. Purpose of research

The main purpose we want to highlight in this study is the treatment of the recovery of osteoporosis by kinetic means, investigations used to put diagnosis, the effectiveness of its treatment, and awareness of the importance of physical therapy in this condition.

2.2. Case presentation

Anamnesis: Subject C.E, Female, 60 years, on 5.03.2019 she checked herself into the hospital with pain in her back, specifically lumbar, the adoption of a vicious position and the limitation of the movement of the lumbar spine.

- Paraclinical examinations: - X-ray of the thoraco-lumbar spine in front and profile
- Osteodensitometry DEXA, result being: T score = -2,7 (71%)

Following paraclinical investigations and examinations, the diagnosis was of osteoporosis.

2.3. Objectives pursued:

- Reducing the incidence of osteoporotic fractures by improving physical function;
- Increased muscle strength and strength;
- Correction of vicious postures and alignment of body segments;
- Improving effort capacity;
- Maintaining/ improving balance and coordination;
- Maintaining/ restoring joint mobility;

- Keeping the respiratory volume within normal limits.

2.4. Kinetic program

- Working duration: I worked with the patient from February 28, 2019 to May 30, 2019, three sessions of physical therapy per week of 1 h / 1h and a half.
- The kineto program was individual in nature, according to the purpose pursued, in addition to this, the patient also benefited from physiotherapy during hospitalization.
- At the beginning of the programme we made an initial and final evaluation at the end.
- To assess joint mobility, we used the measurements with the goniometer (joint bile) and 3 tests:
  1.Schober test;
  2.Ott test;
  3.Stibor test.
- The muscle balance helped me appreciate the value of the force that the patient has on a value scale from F0 to F5.
- For balance assessment we used: Classic Romberg Test and Unipodal Test.

3. Results and Discussions

Place of progress and basic material conditions

The recovery program took place within the County Emergency Hospital "Saint John the New" in Suceava, RMFB section, together with the qualified staff within it.

Initial patient evaluation

Dorso-lumbar column – articular balance initial values

Torso flexion. Normal value: 80-90 degrees [7]. The patient performs 78 degree in flexion.

Torso extension. Normal value: 20-30 degrees [7]. The patient performs 15 degree in extension.

Inclination of torso. Normal value: 20-35 degrees [7]. The patient performs 20 degrees in the right and left inclination the same.

Dorso-lumbar column – articular balance final values

After completion of physiotherapeutic treatment and the physical therapy program is done the final evaluation of the musculoskeletal system.

Dorso-lumbar column – articular balance sheet:

Torso flexion: the patient performs 82 in flexion.

Torso runk extension: The patient performs 18 - in extension.

Torso inclination: the patient performs 24 in cpr.

The interpretation of the results obtained is set out in Figure 1.

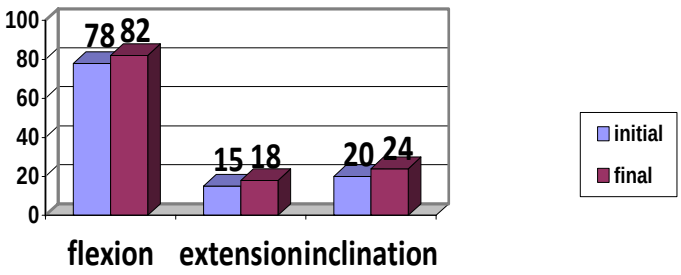

Fig. 1. *Initial and final evaluation of the articular balance sheet*

Tests for articular mobility of the dorso-lumbar spine:

From the orthostatism position with the flexion of the torso the patient carried out the following:

Schober test: normally the distance between the two parts should increase by 5cm. Following measurement, the distance increased by 3 cm at the initial test and by 5 cm at the final assessment.

Schober test initial and final values Table 1

Torso position	Rating	Static position	Anteflexion position
Measured distance from L5	Initial	10 cm	13 cm
	Final	10 cm	15 cm

Ott test: The patient performed the torso flexion, normally the distance between the two point's increases by 5 cm. Following the measurement, the distance increased by 2 cm. at the initial assessment and by 4cm. at the final assessment.

Ott test initial and final values Table 2

Torso position	Rating	Static position	Anteflexion position
Measured distance descending from C7	Initial	30 cm	32 cm
	Final	30 cm	34 cm

Stibor test: The patient performed the torso flexion; normally the difference between rest and flexion is 10 cm. In the case of this patient, the distance increased by 8 cm. at the initial assessment and by 10 cm. at the final assessment.

Stibor test initial and final values Table 3

Torso position	Rating	Static position	Anteflexion position
Distance between the two points S1 – C7	Initial	49 cm	57 cm
	Final	49 cm	59 cm

The interpretation of the results obtained is set out in Figure no. 2.

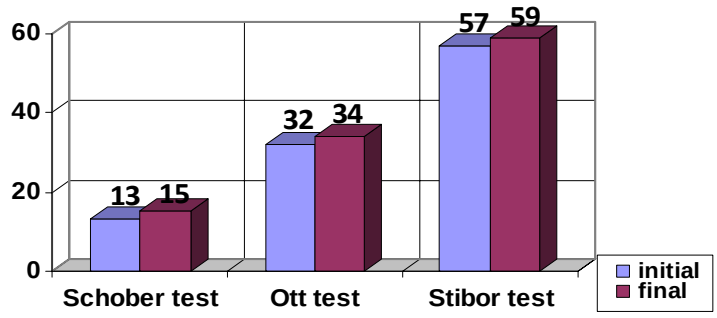

Fig. 2. *Torso flexion tests*

Assessment of muscle balance of the dorso-lumbar spine

Torso flexion

Patient fails to do the flexion completely, only sketches it, which is why she receives F3 (50%) for initial force testing. In final testing the patient receives F4 (75%), because it manages to do the flexion by defeating the resistance opposite by the physical therapist.

Torso extension

Patient fails to make the full extension, only sketches it, which is why she receives F3 (50%) for initial force testing. In final testing the patient receives F4 (75%), it managed to overcome the opposite resistance.

Torso inclination

Patient fails to do resistance inclination, so receives F3 (50%) for initial force testing. In final testing the patient receives F4 (75%), because it overcomes resistance.

The interpretation of the results obtained is set out in Figure no. 3.

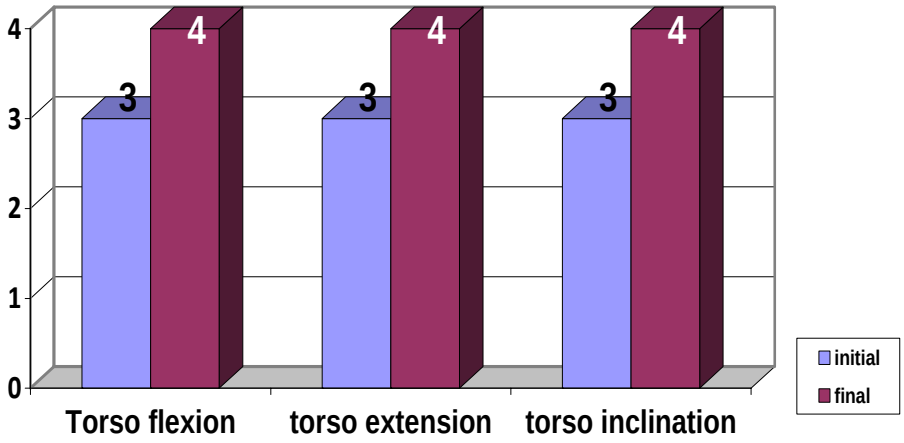

Fig. 3. *Muscle balance*

Balance assessment

The classic Romberg test initially: the patient is in orthostatism with her legs attached, she is asked to close her eyes for 20-30 seconds and maintain position without moving. The degree of swinging (excessive swinging, loss of balance, passage) is assessed.

In this case, the patient experiences slight loss of balance towards the last 10 seconds.

Final Romberg test: patient manages to maintain position for 20 seconds without moving.

Initial Unipodal test: the patient is asked to stand on one leg with her arms crossed to the chest, timeline as long as she can maintain her balance (30-150 seconds).

In this case, the patient maintains the position for 70 seconds.

Final Unipodal test: The patient manages to maintain the position for 100 seconds.

Recovery program used

Physiotherapeutic treatment:

For starters, I am going to present the procedures the patient did on the recovery basis during the hospitalization.

1. **Swimming pool -** hot procedure with water at 35-38 ° C.

The patient is left quietly to adjust to the environment (water, swimming pool) after which passive articular movements are systematically executed for 5-10 minutes. It is left to rest, after which she executes the movements on its own. The duration of the bath is between 20-30 minutes. Mobilization in water is less painful due to muscle relaxation, which occurs under the influence of hot water and loss of body weight. The procedure will be performed once a day with thermal, mechanical mode of action.

2. **Paraffin wraps** - application to the area of the onset of osteoporosis (lumbar column) of a paraffin plate at a higher but bearable temperature by the patient. The patient is placed on the bed, in the ventral decubitus, remove paraffin from the trays and apply to its lumbar area. Then cover the patient with a sheet and thus leave to stand for 15-30 minutes, the procedure performed once a day.

Beneficial effects of this procedure: increased elasticity, with effect in reducing contracts, antalgic effect.

3. **Diadynamic currents** - low frequency currents with antalgic effect, hyperemiate and d stimulative effect.

The patient sits on the bed in the ventral decubitus and is applied 2 electrodes covered with spongy fabric moistened on the lumbar, paravertebral area, supported by sand bags. For 10 minutes, and for analgesic effect, the method of phase application is used which raises the threshold of painful sensitivity. It is also assigned an effect to improve arterial circulation. The procedure shall be carried out once a day.

4. **Ultrasound** - mechanical pendulation vibrations in the high frequency current category.

The patient is in a relaxed state, in ventral decubitus, the affected area is free and covered with a gel layer, apply the transducer and gently massage for 5 minutes to the intensity of 0,6-0,8W/ cm2. The procedure is made out 1-2 times a day.

5. **Massage** – The patient is in ventral decubitus, will massage the entire back area not just lumbar to prepare the body for effort (physical therapy exercises). A meeting lasts between 20-30 minutes.

Avoid using tougher techniques such as the tapotement.

The massage will be relaxing, more smoothing manoeuvres and light friction will be used.

The physical therapy program was conducted as follows:

A. At the beginning of each session, I gave the patient a back massage for 20-30 minutes.

B. Exercises for preparing the body to exercise 5 minutes.

C. Corrective exercises for the formation of the correct posture reflex of the body and exercises of increased muscle strength 30 minutes.

D. 15-minute balance and strength exercises.

E. Respiratory gymnastics 10 minutes

I worked with the patient 3 sessions a week in the physical therapy office, a session was 1 h and 30 minutes, because at first the patient was performing the exercises a little harder, not having a very good physical condition.

The most beneficial and simple exercises for heating the body are stretching ones.

They improve the degree of flexibility of the body and provide an elasticity of the muscles.

In the recovery program were used exercises from orthostatic position, sitting exercises, exercises made of dorsal decubitus, exercises made of quadrupeds, exercises made of lateral and ventral decubitus and respiratory gymnastics.

During the case study we carried out initial assessments at the beginning of the recovery programme and final evaluations after its completion, and their graphical interpretation is presented below.

Following this case study, efficacy of osteoporosis treatment may be observed. The patient had an evolution in the evaluation of the musculoskeletal system.

Goniometric, I measured the movement amplitude of the spine, and as it could be seen, following the 3 months of treatment I was able to achieve a better rate of the spine, increasing in flexion by 4°, in extension by 3° and lateral inclination by 4°.

After performing, centimetres, the torso flexion tests, I found that after kinetic treatment I was able to achieve better mobility of the spine:

The Schober Test notes that the stretch of lumbar spine increased by 2 cm;

Through the Ott Test we observe an extent of the dorsal spine 2 cm more than the initial result;

Through the Stibor Test we notice that in flexion, the spine stretches 2 cm more.

Toning and muscle strength improved very well, with the means applied for the patient's recovery, given that at the beginning of treatment it was presented with lower muscle strength 50% of the potential, and at the end of the recovery programme it reached 75%.

4. Conclusions

The recovery program was for a period of 3 months, during which I could observe a lot of will from the patient “C.E.”

Kinetotherapy has a very important role in the treatment of osteoporosis alongside physiotherapy and drug treatments. Once osteoporosis is installed in the body, we will not get rid of it; just it can improve and stop its evolution.

In conclusion, I can say that I was able to show how effective the recovery treatment for osteoporosis is and that this condition can be improved and stopped with the help of physical therapy and physiotherapy, preventing the appearance of fractures.

Proposals

- I propose that treatment for osteoporosis should not stop the life of a man suffering from this condition. The kinetic program can also be performed at home by the patient, and the physiotherapeutic program will be repeated at a time interval in the specialized outpatient.
- Osteoporosis should not be neglected, as letting time pass itself to a higher degree and subsequently

to fractures that lead to functional impotence.

- If the indications of specialists are followed and kinetic treatment is continued, tests for measuring bone density are carried out periodically, a properly controlling diet and lifestyle will be adopted, then this condition may be kept under control.

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