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Original article

IMPROVEMENT OF PRIMITIVE COXARTHOSIS THROUGH PHYSICAL EXERCISE

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Abstract*

Aim. The purpose of this experiment was to help improve the recovery process in terms of reducing recovery time and increasing its effectiveness, and to emphasize the importance of physical exercise in relieving the symptoms of primitive coxarthrosis.

Methods. The study was conducted at the Techirghiol Balneal and Recovery Sanatorium in March 2017 and included 20 patients, of which 8 women and 12 men, diagnosed with primitive coxarthrosis, on the basis of the clinical examination performed by the physician, in conjunction with paraclinical examinations. The subjects included in the experiment were divided into two groups, control (which followed only simple balneal treatment) and experimental (which also performed physical therapy along with balneal treatment).

Results. The results obtained from the application of the physical exercise program were present in the dynamics of their evolution, starting from the values recorded at the first examination, until the end of the treatment.

Conclusions. Training the subjects from the beginning of the recovery program on the objectives pursued and the effects of exercise on the body, the formation of strong motivations have led to optimization of treatment through their conscious and active participation.

Keywords: coxarthrosis, physical exercises, balneotherapy

Introduction

Arthrosis is the most common disease in the world. Hip arthrosis is an articular degradation with a defined individuality characterized by a morphological imbalance dependent on a functional imbalance, a multi-etiological but mono-pathological disorder, an expression of hip anatomical-functional degradation. It is found in people aged over 40, and its frequency increases with age, with a slight predominance of female gender.

The introduction of physical exercise through kinesiotherapy into the balneary recovery program of primitive coxarthrosis significantly alleviates the symptoms of this disease.

Coxarthrosis of the hip joint is diagnosed in both children of any age and in adults, but men and women over 40 who are overweight and have a family predisposition to the disease are at increased risk. It is worth noting also the propensity to transfer coxarthrosis through the female line and an increased risk of disease after reaching 60-65 years of age (Felson, 2009).

Kinetic rehabilitation programs offered as first-line therapies aim at significantly reducing pain and inflammation, restoring hip stability, improving movement, preventing and controlling vicious attitudes, correcting the trunk and basal position by toning the lumbar paravertebral and limb muscles, to educate the patient on the rules of life in accordance with hygiene rules of the hip, allowing him as much independence as possible, as well as socio-professional reintegration. A kinetotherapeutic program should always be included in any therapeutic regimen of osteoarthritis; the orientation of the program is based on the clinical-anatomic-functional stage of the disease. Properly dosed and controlled movement is indispensable for maintaining joint lubrication, slowing the progressive limitation of the extent of joint movements and preserving muscle trophicity.

Method

The study was conducted at the Techirghiol Balneal and Recovery Sanatorium in March 2017 and included 20 patients, of which 8 women and 12 men,

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diagnosed with primitive coxarthrosis, on the basis of the clinical examination performed by the physician, in conjunction with paraclinical examinations. The subjects included in the experiment were divided into two groups, control (which followed only simple balneal treatment) and experimental (which also performed physical therapy along with balneal treatment).

Taking into account the functional consequences of the hip joint impairment, the objectives of the kinesiotherapy program used were the increase in muscle strength in the lower limbs and the improvement of hip joint mobility.

In order to perform the functional balance of the patients, the perimetry and the measurement of joint mobility were used, as evaluation methods, by goniometry. An initial assessment was made at the admission of subjects prior to physical therapy and one after the last kinesiotherapy session before discharge.

The recovery strategy used in the experiment: toning muscles and restore joint mobility

The exercise program applied to the experimental group

The subjects of the experimental group performed 10 physical therapy sessions, each of 30 minutes each, for 2 weeks, as long as the hospitalization lasted.

The exercises included in the program used in this experiment were performed on the mattress and on a fixed scale.

After the mattress and fixed scale program, the experimental group subjects peddled for 10 minutes on the ergometric bicycle.

In parallel with physical therapy sessions, both groups followed physiotherapy procedures (ultrasound, short waves, interferential current, magnetotherapy etc.), mud baths specific to Techirghiol resort, hydrokinesiotherapy (20 minutes sessions, general mobilizations) and massage.

The experimental group was also given the means to avoid or overcome the fear of movement, to remain more active after finishing the physical therapy session, to avoid 'over-care', prolonged bed rest and to continue its activities as normal as possible.

Results

Table 1. The T-test results of functional balance of experimental group

Experimental group Range of motion (°)	Initial tests		Final tests		t	p
	X±Ds	Cv (%)	X±Ds	Cv (%)		
Flexion	85.6±16.9	19.75	91.7±18.31	19.96	6.13	<0.0005
Extension	16±7.74	48.41	21±7.68	36.61	7.31	<0.0005
Abduction	33.5±5.79	17.3	40.6±6.24	15.36	10.05	<0,0005
Adduction	13.5+6.68	49.53	16.6+6.5	39.16	5.89	<0,0005

Table 2. The T-test results of functional balance of control group

Control group Range of motion (°)	Initial tests		Final tests		t	p
	X±Ds	Cv (%)	X±Ds	Cv (%)		
Flexion	81,6±16,22	19,88	82,1±16,39	19,96	3	<0.01
Extension	14±6,58	47,02	14±6,58	47,02	0	>0.05
Abduction	34±6,58	19,36	34,6±6,38	18,44	2,71	<0,025
Adduction	14,5±6,85	47,25	14,5±6,85	47,25	0	>0.05

Table 3. Initial tests comparison results between experimental and control group

Initial tests Range of motion (°)	Experimental group X±Ds	Control group X±Ds	t	p
Flexion	85.6±16.9	81,6±16,22	0.54	>0.05
Extension	16±7.74	14±6,58	0,622	>0.05
Abduction	33.5±5.79	34±6,58	0,18	>0.05
Adduction	13.5+6.68	14,5±6,85	0,33	>0.05

Table 4. Final tests comparison results between experimental and control group

Final tests Range of motion (°)	Experimental group X±Ds	Control group X±Ds	t	p
Flexion	91.7±18.31	82,1±16,39	1,235	>0.05
Extension	21±7.68	14±6,58	2.187	<0,025
Abduction	40.6±6.24	34,6±6,38	2,126	<0,025
Adduction	16.6+6.5	14,5±6,85	0,703	>0.05

Table 5. The T-test results of leg perimeters of experimental group

Experimental group Leg perimeters (cm)		Initial tests X±Ds	Initial tests Cv (%)	Final tests X±Ds	Final tests Cv (%)	t	p
Thigh	Right	64.71±9.05	14.66	63±9.18	14.58	0	>0.05
	Left	57.87±12.78	22.09	63.33±9.22	14.56	0	>0.05
Leg	Right	43.25±9.2	21.29	43.25±9.2	21.29	0	>0.05
	Left	44.44±8.93	20.09	46.37±7.26	15.67	0	>0.05

Table 6. The T-test results of leg perimeters of control group

Control group Leg perimeters (cm)		Initial tests X±Ds	Initial tests Cv (%)	Final tests X±Ds	Final tests Cv (%)	t	p
Thigh	Right	51.66±10.98	21.26	51.66±10.98	21.26	0	>0.05
	Left	51.33±9.89	19.28	51.33±9.89	19.28	0	>0.05
Leg	Right	38.87±9.73	25.03	38.87±9.73	25.03	0	>0.05
	Left	38.87±9.12	23.47	38.87±9.12	23.47	0	>0.05

Table 7. Initial tests comparison results between experimental and control group

Initial tests Leg perimeters (cm)		Experimental group X±Ds	Control group X±Ds	t	p
Thigh	Right	64.71±9.05	51.66±10.98	2,00	<0.05
	Left	57.87±12.78	51.33±9.89	1,169	>0.05
Leg	Right	43.25±9.2	38.87±9.73	0.924	>0.05
	Left	44.44±8.93	38.87±9.12	1.269	>0.05

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Table 8. Fianl tests comparison results between experimental and control group

Final tests Leg perimeters (cm)		Experimental group X±Ds	Control group X±Ds	t	p
Thigh	Right	63±9.18	51.66±10.98	2,162	<0,025
	Left	63.33±9.22	51.33±9.89	2,397	<0,025
Leg	Right	43.25±9.2	38.87±9.73	0.924	>0.05
	Left	46.37±7.26	38.87±9.12	1.818	<0.05

Discussion

The results obtained after the application of the physical exercise program were present in the dynamics of their evolution, starting from the values recorded at the first examination, until the end of the treatment.

By comparing the results of the initial evaluation with each test type with the results of the final evaluation, the following are observed:

- the flexion improved in the subjects of the experimental group compared to those in the control group;
- the extension has progressed, less than the flexion;
- the abduction improved in the subjects of the experimental group compared to those in the control group;
- the adduction improved less than the abduction;
- the perimetry does not show any significant changes, so that the program used does not address significantly the increase in muscle mass, or its time was too short;
- the subjects of the control group obtained overall modest improvements in joint mobility and muscle strength compared to the subjects included in the experiment.

By comparing the results with the normal values of the hip joint motion, we notice that the results obtained from our research fall within the normal parameters.

The so-called normal physiological values of healthy persons were taken as hundred percent, e.g., for the hip 15/0/130–140o for extension and flexion, 30–45/0/20– 30o for abduction and adduction, 30–50/0/30–50o for outer rotation and inner rotation (Wuelker, 2005), and for the knee 10–5/0/120–150o for extension and flexion (Wuelker, 2005).

These aspects apply to the experimental group that performed the balneal treatment and the physical exercises proposed by us in parallel. We consider that the exercises proposed to the subjects of the research were judiciously chosen and staggered according to the needs of each patient.

Group means reveal improvements from one test to the other, even if statistical significance is not recorded in the comparison between the two tests. Also, the comparison of the groups in both the initial and the final testing reveals improvements in the articular balance but statistically insignificant.

The experimental lot has improved mobility up to 10 degrees and increased muscle mass up to 0.08 centimetres.

A meta-analysis on coxarthrosis based on 9 trials and published by Hernández-Molina, Reichenbach et al., (2009) in PMC set as conclusion that therapeutic exercise, especially with an element of strengthening, is an efficacious treatment for hip osteoarthritis.

Another study published on Journal of Arthritis Care & Research, American College of Rheumatology, by Hoeksma, Dekker et al. in 2004, on 109 patients that were divided into two groups of 56 and 53 patients reveal that the effect of the manual therapy program on hip function is superior to the exercise therapy program in patients with oosteoarthritis of the hip.

Conclusions

Following the study, the following conclusions can be drawn:

1. Applying an exercise program to a hip osteoarthritis significantly improves the functionality of this joint.
2. Balneotherapy relieves inflammation, decreases pain, but has little effect on increased mobility, strength, suppleness, joint stability.
3. Training the subjects from the beginning of the recovery program on the objectives pursued and the effects of exercise on the body, the formation of strong motivations have led to optimization of treatment through their conscious and active participation.
4. Recovery programs designed helped to:

- restoring joints;
- accelerating the resorption of inflammatory processes;
- restoring strength and muscle strength;

- restoring motor control and affected hip abilities;

- re-adaptation to the effort of patients and their reintegration as complex and complete as possible.

5. The recovery programs in these cases focus on kinesiotherapy, using its techniques and specific means, maintains static and dynamic stability, useful mobility and overall functionality necessary to maintain the joint under optimal activation conditions.

6. Medical recovery is a very useful therapeutic complex to compensate for the functional alterations that occurred during the evolution of this suffering and represents the only way to ensure maximum exploitation of the functional rest.

7. The auxiliary physical means (hydro-, thermo-, electro-, masso-therapeutic, etc.) support the kinetic program accordingly, effectively fighting joint pain and inflammation and contributing to the improvement of parameters of muscle-ligament functionality.

8. Taking into account the initial values of the articular and muscular balance for the control group and for the experimental group, one can notice the improvement of the final values for those who follow kinesiotherapy.

9. Physical exercise has a very important role in relieving the symptomatology of primitive coxarthrosis.

10. Finally, we can say that the goal of all forms of treatment is to disrupt the evolutionary pathogenic chain of osteoarthritis to create conditions of articular regeneration.

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