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EFFICIENCY THROUGH PROCESS OF RECOVERY IMPLEMENTATION GONARTHROSES MASSAGE AND PHYSIOTHERAPY ASSOCIATED WITH PHYSICAL THERAPY

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Abstract
Background. The physical therapy is essential for the articular functionality, in cases like knee arthritis disease. In the knee recovery I have been using methods like physical exercise, electrotherapy and massage.
Objectives. In osteoarthritis, the cartilage in the knee joint gradually wears away. As the cartilage wears away, it becomes frayed and rough, and the protective space between the bones decreases. This can result in bone rubbing on bone, and produce painful bone spurs. Osteoarthritis develops slowly and the pain it causes worsens over time.
Methods. The main goal of any therapy for patients with knee osteoarthritis in most cases is to reduce pain and improve the physical functioning.
Results. In the process of recovery it can be used medicamentation, thermotherapy, electrotherapy, physiotherapy, balneoteraphy, hydrotherapy, ergotherapy.
Conclusion. Physical therapy can help to reduce the pain, swelling, and stiffness of knee osteoarthritis, and it can help improve knee joint function. Working out muscles in the leg can help make the knee joints stronger. Strengthening these muscles alone can help decrease the pain of knee osteoarthritis. Because knee osteoarthritis often makes it hard to move, flexibility exercises are very important. Doing them regularly can help increase range of motion, make the knees more flexible.

Keywords: *physical therapy, physiotherapy, massage, osteoarthritis*

Introduction

Osteoarthritis is a degenerative affection localized at the knee joint level, without being an invalidated arthrosis as cox-arthrosis. If it is not treated, it ends up producing serious injuries in an alert pace, evolving to a partial or total blocking of articular movements. When it comes to gender, osteoarthritis affects both women and men, but for women the percentage is higher, of roughly 64%, the disease beginning especially after menopause, meaning between the ages 40-70. Epidemiologic studies show that over 80% of the persons above the age of 60 present degenerative modification in one or more of the joints, which reduces their daily activities, more exactly reduced work ability.

Three main joints are localized at leg level: hip joint, knee joint and ankle joint. The knee has the largest intermediary joint, having multiple roles. Being involved in several diverse daily activities, the knee offers stability during walking, offers balance and support while standing and helps in rising the leg. It also supports going up and down the stairs, sitting down and lifting objects (Baciu C. 1977).

The installation of the degenerative process at knee level takes place when an imbalance exists between the resistance of the structures which compose the articulation and

the degree at which the structures are used. More exactly, when a predisposition exists, the degradation of the joint is directly proportional with the level at which these structures are used.

With respect to the third age persons, the stage of the osteoarthritis can be evolved, the joint being significantly affected (Constantin B. 1997).

Being the largest in the human body, the knee joint is composed of two joints, the femoral-tibia and the patellar-femoral, which acts as one. The joint extremities of the knee are represented by the surfaces of the articular joints of the femoral condyles and femoral trochlea, upper tibia epiphysis - tibia plateau with the two joint faces of tibia condyle slightly concave and oval, inter-cordilleran eminence unites them (Ifrim M 1977). At the knee level the fibrocartilaginous menisci appear, at the edge of the articular surfaces of the tibia condyles, to achieve congruence in extremity joints. There are two menisci intraarticular – an external one shaped as the letter O and internal one shaped as the letter C. The menisci are mobile in articulation, being movable together with the femoral condyles on the articular surfaces of the tibia condyles. The exterior of the meniscus is vascularized, the internal surface being avascular. At the knee level, there are both passive as well as active bonding means. By means of passive union we understand: the joint capsule, patellar tendon, ligament (arcuate popliteal, oblique popliteal, fibular collateral, collateral tibia, posterior crossed anterior extern and posterior intern), synovial fluid. The synovial fluid plays a crucial role in all joints, being produced mainly by movement: feeding the articular cartilage, cleansing of cellular debris, lubrication of articular surfaces, i.e. hyaline cartilage that covers them, favoring sliding joint surfaces to each other, without causing injuries. The means of active union are represented by musculature: abductor, adductors, flexors, extensors. Speaking strictly in the knee region, the quadriceps muscle consists of 4 beams: right femoral, medial vast, lateral vast, intermediate vast, ensures extension of the leg on the thigh and stabilizes the knee in extension. In osteoarthritis, one of the recovery objectives is to achieve full extension of the leg on the thigh, to secure the knee in motion, quadriceps muscle being the one that locks the knee during active movement.

The emergence of primary osteoarthritis is related to a number of endocrine factors (ovarian failure, menopause), metabolic - two out of three patients are overweight (obesity alters the articular cartilage though overloading), vascular -varices, while the emergence of secondary osteoarthritis is linked to various joint misalignments like genu varoom or genu valgus (misalignment of axis femoral-tibia axe with consecutive requests in varoom or valgus constitutes a mechanical stress which can initiate arthritis, osteoarthritis being four times more common in those with genu varoom or valgus than in those with a normal femoral-tibia axis), ligament instability (forces acting on surfaces extremity joints are no longer evenly distributed), previous injury where the bone was targeted, damage to the meniscus, misalignment of the patellar device (patellar dysplasia, dislocations, patellar subluxations), inflammatory joint chronic arthritis: for example poli-arthritis. Another determining factor would be the biomechanical changes caused by flat feet, dislocations or subluxations of hip. The emergence of osteoarthritis can be also attributed to genetic factors triggers (fragile articular cartilage, prone to degradation).

The two knee joints can be affected separately or together (most frequently at the third age), when articular cartilage lesions appear. The onset of the disease is insidious, pain being the main symptom of mechanic type, which occurs during daily activities of every kind, calming itself at rest (the pain does not stop in terminal stage and the patient is found in joint functional incapacity, when the lead role is attributed to orthopedic surgery through applying a prosthetic knee). The pain is felt in the front or internal anterior knee, posterior in the popliteal space, or with radiation from the knee to the calf (Cretu A. 2003).

The functional deficit which appears is represented by: joint instability, joint mobility and limiting pathological mobility. In case of joint instability of muscular cause, increase strength through physical therapy is essential. In case of joint instability with articular incongruity, physical therapy is not efficient. For geriatric patients in osteoarthritis stage 2 evolved, limiting the mobility of the knee is imminent. Flexion can reach up to 90 degrees, associated with a flex of the knee. Hypothome and hypotrophy of the quadriceps femora causing instability in walking and other activities appears, requiring active mobilization of the knee. Crepitus intensifies, radiographic being able to notice pinching of the articular interlining, surfaces osteo-sclerosis of the bone extremities. The patient will cross geriatric chronic periods, alternated with bouts of acute inflammation that occurs with exacerbated pain and a marked limitation of joint amplitude. In these outbursts, the hypersecretion of inflammatory synovial fluid is present, which deforms the knee(Constantin B.1997).

Research objectives

1. Increase the amplitude of the knee joint
2. Pain relief

Recovery methods:

Physiotherapy

In relieving symptoms of osteoarthritis using physiotherapy, procedures such as laser, ultrasound, shortwave, diadynamic, TENS are used (Radulescu A. 1989).

The laser is a device with optical device that generates light beam. It has painkiller effect, edematous, bio stimulatory and vasodilator. The laser is applied to the painful area, irradiating the affected area.

Mechanical ultrasound emits frequencies higher than 20,000 Hz .The commonly used frequency in physiotherapy is 0.8 to 3 MHz. By vibrating of the emission head, the beam is transmitted into the tissue using ultrasonic gel. Ultrasound has the following effects: analgesic, muscle relaxant, hyperemia or vasculo-trophic. The main physiological effects are associated with derivatives ones such as fibrolite and anti-inflammatory.

Ultrasound can be used in the continuous field, producing the so-called micro endo tissue massage effect (in the depth of tissue), or by using the ultrasound with pulses.

Short waves are high frequency currents, which allow therapy to be performed through the condenser field and through the electromagnetic field both in continuous operation mode and in the pulsed.

The use of high-frequency power allows greater permeability in the joint. They are used to reduce pain, inflammation, spasms and for muscle relaxation(Slavila M.2013).

Diadynamic is a low-frequency current, which is painkiller, anti-inflammatory, edematous effects. The electrodes are applied to the painful area.

Through TENS, a cutaneous electrical nerve stimulation is produced, having analgesic effect, the electrodes being applied as in the case of diadynamic, to the painful area.

The purpose of this research is physical therapy program associated with physiotherapy and massage, aimed at increasing joint mobility, increase muscle strength and reducing pain.

Massage

In osteoarthritis, the massage is important for toning the muscles that stabilize the joint, has a sedative effect on neuralgic, muscle or joint pains and has a hyperemia action on the massaged the region.

Moreover, a vasodilation occurs in skin capillary vessels by blood circulation. With skin hyperemia, the skin heating occurs, removing the interstitial fluid while accelerating the

resorption in the massaged region. The venous return circulation is also facilitated and the general condition of the patient improves, by also removing muscle fatigue. Furthermore, it has reflexive action on the suffering internal organs, which is explained by the reflex mechanism. The following are some of the procedures used: smoothing, kneading, friction, vibration friction. (Sbenghe T. 1981).

Physical therapy

In stage 2 evolved, physical therapy is based on posture, muscle toning, joint mobilization.

Postures are used to correct flexes and deviations of type genu varoom, genu valgus. Quadriceps, hamstrings and rotators will be involved in order to increase muscle tone and strength. Since a major problem in osteoarthritis is the decrease of joint mobility, joint mobilization is necessary to increase joint amplitude, i.e. regain full extension and flexion increase. To obtain a normal or close to normal joint amplitude from a physiological perspective, means such as posture, passive and active mobilization are used. Loading exercises like squats must be avoided (Sbenghe T. 1987).

The physical therapy program employed

In supine position (on the mat or bed):

1. Dorsal flexion, planting flexion- 2 sets of 10 repetitions.
2. Inversions-eversions - 2 sets of 10 repetitions.
3. Alternatively, one knee bent, then extended (sole drawn on the work surface) - 2 sets of 10 repetitions.
4. Leg abduction (dorsal flexion) - 2 sets of 10 repetitions each member.
5. Knees bent, feet flat on the work surface, leg extension on the thigh at 45 degrees with dorsal flexion - 2 sets of 10 repetitions.
6. Put your hands under the buttocks, bike runs - 2 sets of 10 repetitions each member.

From sitting:

7. At the quadriceps chair, calf extension on the thigh with 10 kg - 2 sets of 10 repetitions.
8. Leg abductions, with 10 / 15kg- 2 sets of 10 repetitions.
9. Leg abductions, with 10 / 15kg- 2 sets of 10 repetitions.

Standing:

10. At trellis, lifting on toes- 2 sets of 10 repetitions.
11. At trellis, on board balance, balancing left-right - one series, 20 repetitions.
12. At trellis, on board balance, balancing front to back - one series, 20 repetitions.

Posture:

13. The patient supports his leg at the ankle on a high surface, having extended knee. A weighing of 2kg-2,5kg is placed on the high end of the distal thigh - 3-4 minutes each member

Final, bicycle- 7 minutes.

The experiment

The experiment was performed at St. Luca Hospital in Bucharest on a sample of 20 patients, aged 45-75 years, men and women.

The control group comprised of 10 patients (6 men and 4 women) procedures of physiotherapy and massage were applied - 5 sessions per week.

For the experimental group comprised of 10 patients (5 men and 5 women), in addition to the physiotherapy and massage procedures, physical therapy sessions of 50 minutes were performed, also five sessions per week.

Research goal: to identify the best ways of recovering in osteoarthritis, and their implementation in physical therapy programs, leading to increase the amplitude of the knee joint. Osteoarthritis patient's recovery objectives are: combating pain, contractures and muscle atrophy, recovery of mobility and joint stability, mobilization and development of muscle groups that act directly on the knee joint.

In this research the following working methods were used: physiotherapy, massage and physical therapy.

Subjects were followed for 4 periods of hospitalization, of 14 days each.

Results:

Table 1. *Results obtained on control group (percentages regarding flexion)*

Control group			
		Knee joint mobility (Flexion degree)	
No.crt.	**Pacients**	**Before experiment**	**After experiment**
1	P. N.	79°	79°
2	V. S.	83°	83°
3	C. A.	89°	89°
4	P. M.	97°	97°
5	P. S.	75°	75°
6	T. D.	92°	92°
7	S. C.	110°	110°
8	T. A.	105°	105°
9	P. T.	78°	78°
10	P. S.	90°	90°

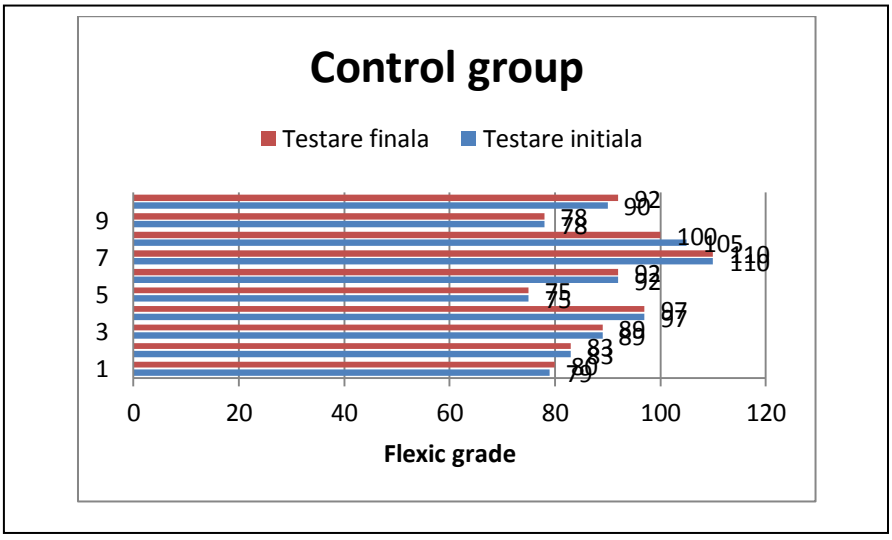

Fig. 2. Graphic of the values obtained on the control group

Table 2. *Results obtained on the experimental group (percentages regarding flexion)*

Experimental group			
		Knee joint mobility (Flexion degree)	
No.crt.	**Pacients**	**Before experiment**	**After experiment**
1	A. C.	70°	72°
2	S. M.	69°	70°
3	T. P.	72°	74°
4	F. G.	80°	83°
5	L. I.	70°	75°
6	H. V.	90°	92°
7	A. R.	85°	88°
8	A. L.	93°	96°
9	A. S.	79°	83°
10	O. H.	100°	102°

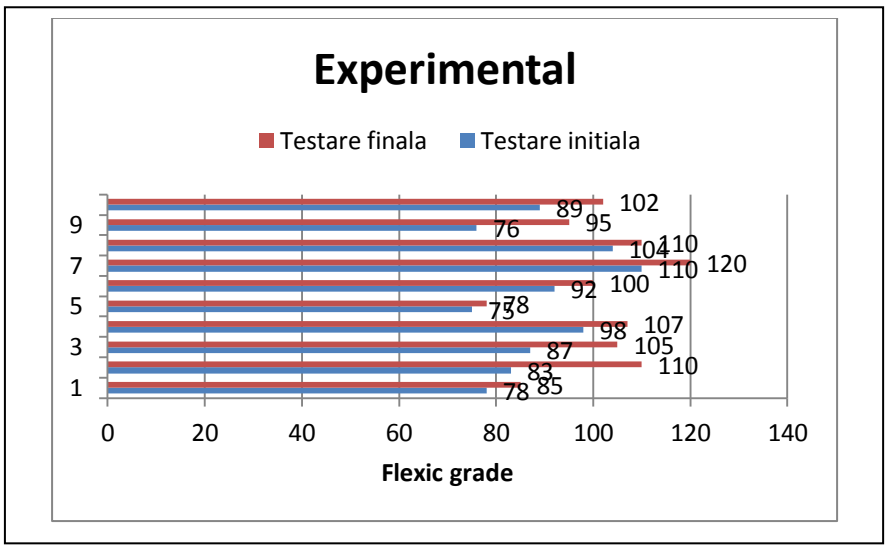

Fig. 3. . Graphic of the values obtained on the control group

Observations: By flexing the leg on the thigh, the back of the calf approaches the back of the thigh. Active flexion progresses from 0 to 120 -140 degrees, while passive flexion reaches 160 degrees.

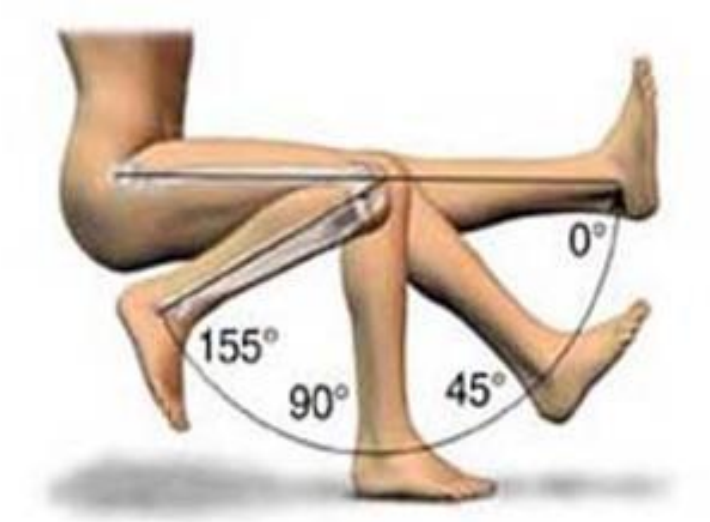

Fig. 1 Image regarding the degrees of mobility in knee flexion, from sitting position (Buzescu A. 2014).

Table nr.3

No.	Control Samples	Patient groups	Initial testing	Final testing	t	P
			Arithmetic mean	Arithmetic mean		
1	Knee flexion (Degrees)	E	89.2	101.2	5.18	<0.05
		M	89.8	89.6	0.34	>0.05
	t, P		0.11>0.05	2.21>0.05	—	—

Note

P		0.05	0.01	0.001
t	n=10	2.22	3.1	4.5
	n=20	2.009	2.8	3.8

Knee flexion. In initial testing, it has been found that the arithmetic mean value is 89.2 in the experimental group, while in the control group is 89.8.

In the final testing,the arithmetic mean value of the experimental group reached 101.2 while the average value reached 89.6 in the control group. It is noted that the experimental group increased values are expressed in an improved mobility of the knee.

The differences between the initial and final testing of the experimental group, highlighted that calculated value "t" = 5.18 is greater than "t" spreadsheet (Fisher) to materiality 0.001, demonstrating significant differences between tests. Regarding the control group, the value of calculated "t" is 0.34 lower than "t" statistically,resulting insignificant differences between tests to P> 0.05.

Noting the differences between the averages of two groups, the initial testing shows that "t" = 0.11 =calculated value is less than statistically "t" at P> 0.05, the result is insignificant and regarding the final testing, "t" =2.21 = calculated value is greater than "t" statistically: it is a significant result at P <0.05.

Conclusions
The physical therapy program led to an increase in muscle strength, joint mobility by several degrees, and moreover the pain was combated due to the applicability of physical therapy procedures associated with physiotherapy and massage.

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RESEARCH OF THE PERFORMANCE EFFECTS OF CUSTOMER VALUE OF FITNESS CENTER CUSTOMERS ON CUSTOMER RELATIONSHIP MANAGEMENT AND BRAND LOYALTY THROUGH CUSTOMER SATISFACTION: SAMPLE OF MANISA CITY

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