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Original Paper

The Rehabilitation of Elderly Institutionalized Patients with Osteoarthritis (Multiple Joint Involvement) Using Alternative Methods Associated to Drug Therapy

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REZUMAT

Reabilitarea pacienților de vârsta a III-a instituționalizați cu osteoartită (determinări multiple) prin metode asociate medicației – kinetoterapie, psihoterapie

Obiectivele studiului: Introducerea în schema de tratament a pacientului de vârsta a III-a instituționalizat cu osteoartrită cu determinări multiple a tehnicilor kinetoterapeutice de facilitare neuro-musculară adaptate stadiului clinico-anatomo-funcțional al bolii și localizărilor acesteia, precum și a tehnicilor și metodelor psihologice și psihopedagogice (variabile independente în reabilitarea funcțională). Stabilirea aportului intervenției psiho-kinetoterapeutice prin evaluarea rezultatelor la pacienții de vârstaa III-a instituționalizați cu osteoartrită cu determinări multiple.

Materila și metodă: Studiul a fost unul experimental, realizat pe un număr de 40 de pacienți de vârsta a III-a instituționalizați cu artroze localizate la nivelul șoldului, genunchiului și coloanei vertebrale.

Rezultate: Am observat scăderea intensității durerii în ambele loturi, în special la grupul studiat comparative cu grupul martor.

Concluzii: Conceperea unui algoritm intervențional complex la pacienții de vârsta a III-a cu osteoartrită cu determinări multiple va conduce la creșterea calității și eficienței procesului de reabilitare (reeducare funcțională musculo-articulară și cardio-respiratorie). Îmbunătățirea progresivă a amplitudinii mișcărilor articulare și păstrarea tonicității musculaturii,

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precum și conservarea capacității de autoservire devine cu atât mai eficientă cu cât este realizată într-un centru de specialitate și supravegheat de kinetoterapeut și cu cât există o pregătire psihică corespunzătoare preintervențională, fapt dovedit de rezultatele constant bune obținute de pacienții grupului experimental.

Cuvinte cheie: osteoartrită cu determinări multiple, resurse psihopedagogice, kinetoterapie, pacient instituționalizat, vârsta a III-a

ABSTRACT

Aims of the study: The introduction of neuromuscular facilitating kinesiotherapeutic techniques adapted to the clinical, anatomical and functional stage of the disease and its location, as well as psychological and psychopedagogical techniques and methods (independent variables in functional rehabilitation) in the treatment regimen of institutionalized elderly patients with multiple joint involvement osteoarthritis. Determining the contribution of the psycho-kinesiotherapeutic intervention by assessing outcomes for institutionalized elderly patients with multiple joint involvement osteoarthritis.
Methodology: We conducted an experimental study on a total of 40 institutionalized elderly patients with localized arthrosis in the hip, knee and spine.
Results: We observed a positive trend in the evolution of pain intensity, i.e. pain reduction was noted in both groups, with a better outcome in the experimental group.
Conclusions: Designing a complex interventional algorithm for elderly patients with multiple joint involvement osteoarthritis will increase the quality and efficiency of the rehabilitation process (muscle-joint and cardiorespiratory functional re-education). The gradual improvement in the range of joint motion and the preservation of muscle tone, in addition to the conservation of the self-service capacity are more effective when performed in a specialized center and under the supervision of a kinesiotherapist after an adequate pre-intervention mental preparation, as evidenced by the good outcomes consistently obtained by the experimental group of patients.

Key words: osteoarthritis with multiple joint involvement, pedagogical resources, kinesiotherapy, elderly institutionalized patients

INTRODUCTION

Osteoarthritis, as a major cause of disability and due to the high prevalence among chronic diseases, represents one of the most important public health problems worldwide [1]. The limitation of physical function and the restriction of independence produce negative effects on the mental status of patients suffering from osteoarthritis, namely the emergence of depression and decreased self-confidence [2,3]. Developing a kinesiotherapeutic strategy based on the clinical, anatomical and functional stage of the disease and other comorbidities, as well as exploiting psychological and psychopedagogical resources will improve the physical performance and increase the independence of these patients [4,5]. In order to achieve a modern and effective rehabilitation, kinesiotherapy, the newest component of physical medicine, is the fundamental methodology for restoring the functions of complexmyo-arthro-kinetic and cardiorespiratory systems, at the same time exerting a positive influence on the effects of the pharmacological, psychological and occupational therapy.

AIMS OF THE STUDY

Introducing into the treatment regimen of the elderly institutionalized patient suffering from multiple joint involvement osteoarthritis kinesiotherapeutic techniques of neuro-muscular facilitation adapted to the clinical, anatomical and functional stage of the disease and its location, in addition to psychological and psychopedagogical techniques and methods (independent variables in functional rehabilitation).

Determining the contribution of the psycho-kinesiotherapeutic intervention by assessing outcomes for institutionalized elderly patients with multiple joint involvement osteoarthritis.

METHODOLOGY

We conducted an experimental study on a total of 40 institutionalized elderly patients with localized arthrosis in the hip, knee and spine. Exclusion criteria were aimed at patients with an advanced degree of osteoporosis, cardiorespiratory conditions that contraindicated intense physical activity and patients over 90 years of age. Both groups consisted of 20 patients each. The techniques we propose in this paper were applied to the patients in the experimental group in addition to the standard treatment.

Operational kinesiotherapeutic objectives: reducing pain, improving joint mobility, muscle tone, muscle strength and the level of daily activities.

Operational psychopedagogical objectives: improving the mental state of the patient with multiple joint involvement osteoarthritis, combating depression, increasing self-confidence and confidence in the ability of performing certain actions useful for the patient.

The operational objectives have undergone a constant process of analysis and synthesis based on the patient's immediate response and the results of interim evaluations.

Kinesiotherapeutic and psychotherapeutic strategies

Techniques used in the rehabilitation of patients with osteoarthritis → operational objectives

a. Individual variations of proprioceptive neuromuscular facilitation techniques (PNF):

- RC technique (repeated contractions) → facilitating weak agonist muscles by successive induction, contraction achievement;
- RS technique (rhythmic stabilization) → reeducation of active control; reducing joint pain; increasing tone of flexor muscles;
- SIO technique (slow inversion with opposition) in the Kabat's diagonal of the lower limb → increasing tone of thigh and calf muscles;
- AI (agonistic inversion) → promotion of eccentric control in the closed kinetic chain.

b. Individual variations of active techniques - active control: hip, knee and ankle triple flexion – triple extension exercises; active flexions-extensions of hip / knee / spine, rhythmically and without pause between inversions → flexibilization of joints; muscular tensioning and toning.

c. Stretching techniques, self posture:

- stretching (static stretching - by maintaining a position and dynamic stretching - achieved through the execution of rapid stretching of the muscle movements through the isotonic contraction of antagonists or using the body's weight and momentum) – 6 – 8 times a day → reeducation of flexibility / improving joint mobility; recovery of joint mobility deficit caused by adaptive shortenings of the soft tissue - stretching of soft tissue and maintaining this stretch for a longer period of time;
- free posture - 3-4 times a day → avoiding or correcting bad posture.

d. Active exercises – training on different pieces of apparatus: pulley system, power chair, stepper, treadmill → increasing the muscle strength of the lower limb, of the paravertebral, thoracic and abdominal muscles; general muscle toning.

f. Variations of psychopedagogical techniques and methods:

- awareness → the realization of physical abilities;
- comprehension → gaining a better understanding;
- activating → determination to work more intensively;
- stimulation of motivation and needs→ the determination to perform certain actions and to strive for certain useful goals;
- mental preparation → creating favorable mental conditions.

g. Variations of psychotherapeutic techniques and methods: patient transition from a passive state to an active one; generating adaptive phenomena in the body; inducing the perception of a new performance → improving mood; combating depression.

h. Variations of general relaxation techniques, in particular muscle relaxation, increasing respiratory capacity:

- promoting relaxation → reducing pain by relaxation at the level of the central nervous system; reducing pain by local relaxation; reducing muscle contractures or preventing muscle retractions; relaxation for initiating and performing ideomotor training;
- respiratory rehabilitation → promoting control / coordination of breath (frequency, current volume control, rhythm, air flow control) at rest - in motion - during effort; general relaxation / reducing pain by hyperventilation.

Combining PNF techniques and the actual implementation were performed differently, according to the type of the affected joint and patient characteristics. The decision consisted in using certain neurological mechanisms of peripheral and / or central origin and PNF elements in order to produce the desired change in the discharge of α motoneurons innervating the concerned muscles.

The sessions were carried out for 30-40 minutes at a frequency of 3 times per week.

RESULTS

The study group consisted of 40 patients, 29 of whom were female (representing 72.5% of the total) and 11 males (representing 27.5% of total), aged between 55 and 80 years, averaging 70.6 years.

According to gender, in the experimental group 16 patients were female (80% of the total) and 4 patients were male (20% of total), whilst in the control group 13 patients were female (representing 65% of total) and 7 patients were male (35% of the total).

According to age, in the experimental group patients aged between 55 and 80 years, with an average of 71.20 years and in the control group patients aged between 59 and 80 years, with an average of 69.95 years.

A pain scale was used to assess the presence of pain with the following rating values: 0 - no pain; 1 - sometimes; 2 - during vigorous activities; 3 - during moderate activities; 4 - during light activity (walking); 5 - continu-

ous, both while walking and standing. We evaluated both the baseline and the final score for each group by summing the scores of each patient, and subsequently we calculated the difference between the initial and final score for each group. We obtained a total difference of 25 for the experimental group and 17 for the control group. Lastly the difference between the aforementioned total differences among experimental and control groups was calculated and had a value of 8. We observed a positive trend in the evolution of pain intensity, i.e. pain reduction was noted in both groups, with a better outcome in the experimental group (**Table 1** and **2**).

In order to assess the evolution of joint mobility (measured in degrees) we calculated the differences between the initial and final tests for each type of test, namely: for coxarthrosis: flexion + extension + abduction + adduction + internal rotation + external rotation of the hip; for gonarthrosis: knee flexion; for spondylosis: flexion + extension + lateral inclination + spine rotation. Joint mobility increased in all tested joints in the experimental group compared to the control group. Although the differences were not statistically significant, patients in the experimental group benefited from a real clinical and functional gain.

The evolution of the patients' activities of daily living (ADL) was recorded through the ADL score (personal hygiene, dressing, toilet hygiene, locomotion, continence, recreation / rest) obtained for both the experimental group and the control group by summing the individual scores for each of the group's patients. Furthermore we calculated the difference between the baseline and final scores of each group, which had a value of 37 for the experimental group and 20 for the control group. Finally we calculated the difference between the above differences and obtained a value of 17 which demonstrates a better outcome for patients in the experimental group. The following table shows the evolution of ADLs (**Table 3**).

Table 1. The evolution of pain intensity – summary table

Indicator	Experimental group		Control group	
	Baseline	Final	Baseline	Final
Mean	3.55	2.05	3.4	2.3
Standard deviation	0.99	0.75	1.09	0.80

Table 2. The evolution of pain intensity – baseline and final score. Difference between scores

Pain score	Experimental group	Control group
Baseline score	71	68
Final score	41	46
Difference between scores	30	22

Table 3. The evolution of ADLs – baseline and final score. Difference between scores

ADL score	Experimental group	Control group
Baseline score	82	84
Final score	119	104
Difference between scores	37	20

CONCLUSIONS

Designing a complex interventional algorithm for elderly patients with multiple joint involvement osteoarthritis will increase the quality and efficiency of the rehabilitation process (musculo-articular and cardio-respiratory functional reeducation).

Improving the ranges of joint motion and the preservation of muscle tonicity, as well as the conservation of the self-serving capacity become even more effective when carried out in a specialized center and under the supervision of a kinesiotherapist in conjunction with an adequate pre-intervention mental preparation, as evidenced by the good outcomes constantly obtained by the patients in the experimental group.

The introduction of psychotherapeutic and psycho-pedagogical methods within the framework of the intervention plan, as well as permanent assessment of the degree to which the patient actively participates in the whole process of his functional rehabilitation and the adjustment of experimented strategies when necessary will increase the quality of life in elderly patients with multiple joint involvement osteoarthritis.

In our opinion, it is highly recommended to create kinesiotherapy and psychotherapy departments in senior care centers in order to establish a recovery plan, the efficiency of which has been confirmed by the results of our evaluation of specific interventions among patients in the experimental group.

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