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THE IMPORTANCE OF COMBINING PHYSICAL THERAPY AND OCCUPATIONAL THERAPY WITHIN THE COMPLEX PROGRAM OF FUNCTIONAL REHABILITATION IN PERSONS WITH SCAPULOHUMERAL PERIARTHRITIS

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Abstract: *Physical therapy through its fundamental and/or auxiliary means, aims to restore the functionality of the shoulder, responding to pathological changes caused by the algofunctional syndrome characteristic to scapulohumeral periarthritis. For those persons with scapulohumeral periarthritis occupational therapy has as a primary objective their full reintegration, integration on all levels: personal, family and socio-economic. By combining physical therapy programs with individualized programs of occupational therapy we succeed in emphasizing the progress of rehabilitation, evidenced by improving the functional level of the subject and implicitly their quality of life.*

Key words: *functional rehabilitation, scapulohumeral periarthritis, physical therapy, occupational therapy.*

1. Introduction

The shoulder is the anatomical region of the locomotive apparatus which provides, in terms of mobility and stability, the movement of the entire upper limb. Mobility, strength and stability at this level provide extra features of movement of limb segments: upper arm, elbow, forearm, hand [1].

The shoulder, the most mobile and most complex joint of the body can be the localization of various processes: rheumatic, infectious, degenerative, metabolic, vascular, nervous, dystrophic, tumoral [2].

The most common diagnosis encountered when pain is localized at the level of the shoulder is that of scapulohumeral periarthritis. Generally, one can admit that at average age,

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regardless of whether the arm is excessively used or not, at the level of the rotator cuff there is installed a degenerative process favored by some professional physical activities, by vicious postures (an abnormal posture in dorsal kyphosis with anterior projection of shoulders), by local traumatisms or by repeated micro-traumatisms [3].

Scapulohumeral periarthritis, the most frequent form of abarticular rheumatism, appears especially after the age of 40, the distribution by gender being almost equal [4].

The painful clinical syndrome accompanying scapulohumeral periarthritis represents approximately 80% of the shoulder conditions [5].

Physical therapy through its fundamental and/or auxiliary means aims to restore the functionality of the shoulder, responding to pathological changes caused by the algofunctional syndrome characteristic to scapulohumeral periarthritis.

Occupational therapy aims for the patient to return as soon as possible to socio-economic life in the best possible physical and mental condition with an optimal functional level [6].

2. Hypothesis

By applying a kinetic program completed by one specific to occupational therapy, according to the individual needs of people with scapulohumeral periarthritis, one can obtain a better functional level and thus improve their quality of life.

3. Material and methods

The study was conducted at the Medical Rehabilitation Hospital Felix between January 2010 - January 2011. Selection of subjects participating in this study was based on their free will.

The main criterion for the selection of subjects was the presence of a diagnosis of scapulohumeral periarthritis, all subjects having been diagnosed more than a year before this study and had previously followed rehabilitation treatments on several occasions. Selected subjects came both from rural and urban areas.

The rehabilitation program was followed of each subject of the two groups with a frequency of 1 session / day for 18-21 days.

The kinetic program followed by the two groups of subjects included a standard program, individualized according to the clinical and functional form of the disease, consisting of 20-25 exercises, performed in the physical therapy rooms of the hospital, supplemented by a local massage session (5-8'). The subjects of the research lot followed the standard kinetic program which was followed by a program of 12-15 exercises / activities specific to occupational therapy, lasting for 30-45' and even 60', according to each subject's physical, mental or emotional condition.

Table 1

Comparative analysis of the two lots of subjects

Parameter	Research lot	Witness Lot
Average age (years)	48,1	50
Average age of diagnosis	4	3
Sex (M/F)	7/3	5/5
Affected MI (right/left)	4/6	4/6

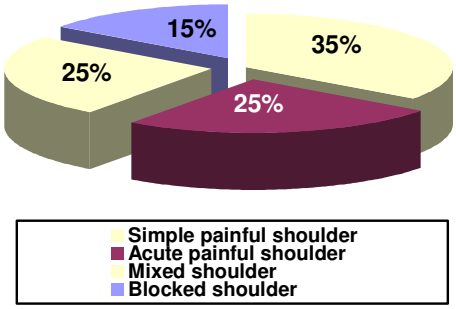

Fig. 1. *Distribution of patients according to the clinical-functional form of the scapulohumeral periarthritis*

4. Research Methods

For this study we resorted to the following research methods:

- *bibliographic study method*
- *interview method*
- *observation method*
- *experiment method*
- *functional assessment of the locomotive apparatus method*
- *graphic and imaging method*
- *statistical and mathematical* analysis *method.*

The first and last act of the rehabilitation process, necessary to develop and implement a functional rehabilitation program is assessment. Assessment is extremely important, initially for assessing the functional deficit and the functional residual, and finally for assessing the results obtained after the rehabilitation program [7].

Functional assessment covered the following aspects:

- assessment of pain according to Huskisson *Visual Analogue Scale (VAS)*;
- assessment of joint amplitude with the goniometer;
- manual assessment of muscular force according to the *International Scale of Assessing Muscular Force 0 - 5*;
- assessment of functional level according to the *Simple Shoulder Test (SST)*;
- assessment of performance within daily activities (ADL) according to the *Canadian Occupational Performance Measure (COPM)*.

Visual Analogue Scale (VAS) is a simple, easily reproducible and accurate instrument enabling the patient to express the severity of felt pain, giving it a numerical value [8].

VAS consists of a straight line, usually 100 mm in length, with edges marked bipolarily from “no pain” to “unbearable pain. “ The patient marks the perceived pain level on the line, that level will be assigned a value by measuring with a ruler the distance between the end of the line (0) and the point marked by the patient.

The Simple Shoulder Test is a simple test developed to assess the functional level; it was created by a group of specialists from the University of Washington and has 12 functional items, in the form of questions, two of which relate to pain, seven to function and three to joint amplitude, the answers to these questions being simple “yes” or “no” [9]. To conduct the testing they require a weight of 1 pound (approx. 450g), one of eight pounds (about 3.5 kg) and one of 20 pounds (about 9kg). Affirmative answers are scored with one point and the negative ones with zero, so the final score may have a value between 0 and 12 [10].

The Canadian Occupational Performance Measure (COPM) is a questionnaire of individualized assessment used by occupational therapists, which was designed to detect changes in the perception that the subject has, in time, of his occupational performance in daily activities (ADL) [11].

COPM is used extensively worldwide, has been officially translated into 22 languages, being distributed in 35 countries [12]; is the first test to be applied in the initial assessment in order to establish later on the therapeutic objectives according to the problems identified by the subject [13].

In order *to identify the problems of occupational performance*, the aspects and results of therapeutic intervention, the subjects were interviewed with regard to their daily self-care, work and free time activities. Subjects must identify daily activities that they want to do, have to do or are required by others, asking them to think about a regular day. Then they must identify which of these activities are carried out with difficulty at that time for each of them. Recording these activities-problems takes place in *Step 1* (1A, 1B, or 1C). In *Step 2* the subject must give a value on a scale from 1-10, to the importance of each activity / problem in Step 1. *Step 3 and 4* consist of the confirmation by the subject of the five most important problems which will be recorded by the assessor. Using the scoring card, the subject is asked to rate each issue in terms of performance and satisfaction on a scale from 1 to 5. The total score is calculated by summing the values for each of the problems both for performance and satisfaction and then dividing the result by the number of confirmed problems. At the final assessment every subject will rate again every each of the issues raised in the initial assessment, both for performance and satisfaction [14].

In carrying out this study assessment was performed twice, initial assessment, before starting the rehabilitation program, and final assessment, after the rehabilitation program.

5. Results

Following initial (I) and final (F) assessments, we notice that the values of pain intensity recorded using the Visual Analogue Scale (VAS) have been decreasing on average by 58 units in the research lot, more pronounced than in the witness lot, who recorded an average decline of 50 units.

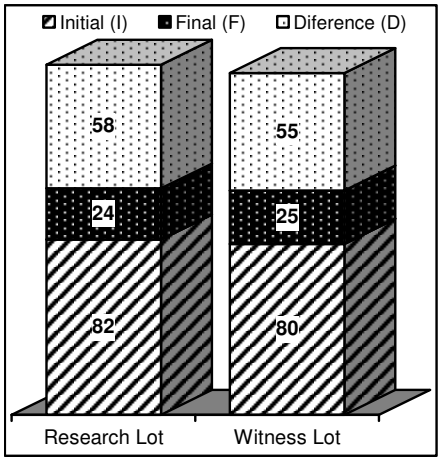

Fig. 2. *Graphic representation of average values of pain intensity according to VAS*

Table 2
Average values of pain according to VAS

Assessment	Research lot	Witness Lot
I	82	80
F	24	30
D	**58**	**50**

At the end of this study the following results were recorded in terms of joint amplitude evolution:

- for *flexion* (Flex) an average difference of 75° was obtained (the research lot), and of 72° (the witness lot);
- for *extension* (Ext) an average difference of 19° was obtained for the research lot and of 16,8° for the witness lot;

- for *abduction* (Abd) the average difference for the research lot was of 67,8°, and 65,4°for the witness lot;
- for *external rotation* (RE) the average difference was of 23° for the research lot and of 20,4° for the witness lot;
- for *internal rotation* (RI) the average difference was of 22,7° for the research lot and of 20° for the witness lot.

The recorded values for unaffected shoulder are approximately equal for the two lots.

Table 3

Average of results obtained at joint testing by the subjects of the research lot

	Assessment		I	F	D
RESEARCH LOT	Affected Shoulder	Flex	47,5	122,5	**75°**
		Ext	21	40	**19°**
		Abd	42,2	110	**67,8°**
		RE	32	55	**23°**
		RI	33,5	56,2	**22,7°**
	Unaffected Shoulder	Flex	102	150	**48°**
		Ext	30	45,3	**15,3°**
		Abd	106	139	**33°**
		RE	52	76	**24°**
		RI	50	72	**22°**

Table 4

Average of results obtained at joint testing by the subjects of the witness lot

	Assessment		I	F	D
WITNESS LOT	Affected Shoulder	Flex	43	115	**72°**
		Ext	18	34,8	**16,8°**
		Abd	35,8	101,2	**65,4°**
		RE	33,6	54	**20,4°**
		RI	34,8	54,8	**20°**
	Unaffected Shoulder	Flex	104	152	**48°**
		Ext	30,1	44,9	**14,8°**
		Abd	106,4	138	**31,6°**
		RE	52,3	75,1	**22,8°**
		RI	51	73	**22°**

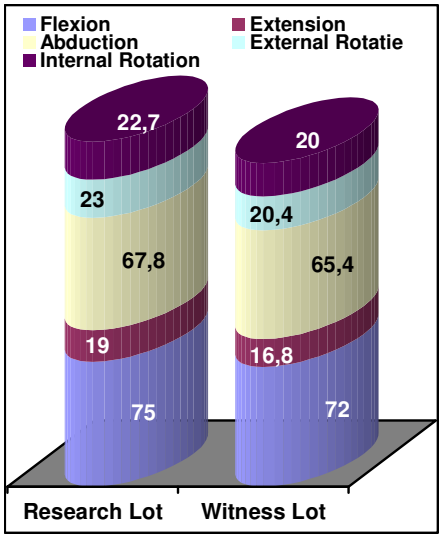

Fig. 3. *Comparative graphic representation of average differences in the evolution of joint amplitude between initial assessment and final assessment*

In order to evidence the changes of muscular force, taking into consideration that we have used the "+" and "–" values, we considered passing from a "+" force to a "–" force by 0,33 points, then from a "–"force to the next value of also 0,33 points, and so on. For instance: the difference from F2– to F2, is of 0,33 points; from F2 to F2+ is also of 0,33.

Table 5

Average values of muscular force evolution recorded at the end of the study

Movement	Research Lot	Witness Lot
Flex	0,85	0,82
Ext	0,72	0,69
Abd	0,72	0,72
RE	0,69	0,66
RI	0,66	0,69

Taking into account this approach, in the case of the research lot at the level of the affected shoulder, between the initial and final assessment we noticed an average increase of the force of the flexor muscles (Flex) of 0,85 points, for extensors (Ext) of 0,72 points, for abductors (Abd) of 0,72 points, for external rotators (RE) of 0,69 points, and for internal rotators (RI) of 0,66 points.

The recorded values for the evolution of the muscular force in the case of the witness lot are close to those of the research lot. So, in the case of the witness lot at the level of the affected shoulder we noticed an average increase of the force of the flexor muscles of 0,82 points, for extensors of 0,69 points, for abductors of 0,72 points, for external rotators of 0,66 points, and for internal rotators of 0,69 points.

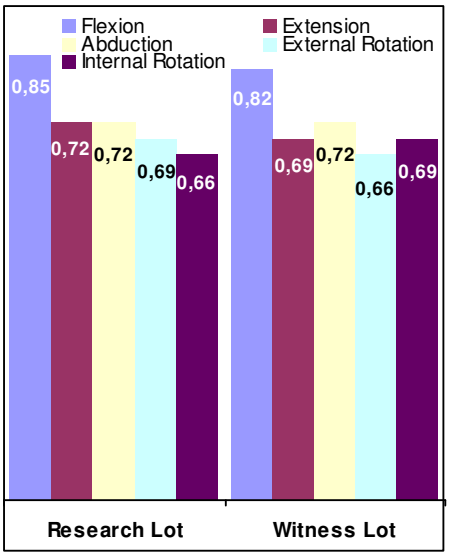

Fig. 4. *Comparative graphic representation of average differences in the evolution of muscular force between the initial and final assessment.*

Table 6

Average results of functional assessment according to The Simple Shoulder Test (SST)

TSU	I	F	D
Research lot	5,2	10,4	**5,2**
Witness Lot	5	9,8	**4,8**

By assessing the functional impact of the symptomatology of scapulohumeral periarthritis with the help of The Simple Shoulder Test (SST) we can notice in the case of the research lot that at the initial assessment the functional score had an average of 5,2 points, and at the final assessment of 10,4 points, the average progression between the two assessments being of 5,2 points, slightly higher than in the case of the witness lot which at the initial assessment recorded an average functional score of 5 points, and at the final assessment of 9,8 points, the average of differences between the two assessments being 4,8 points.

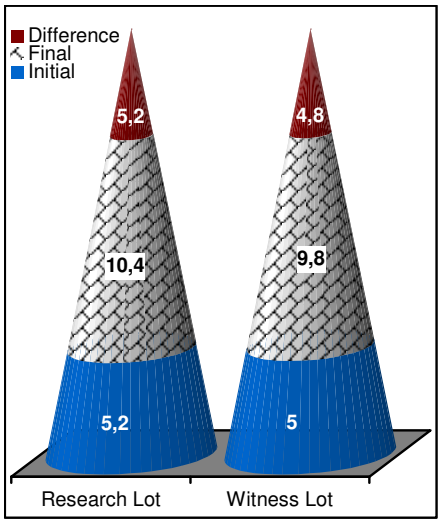

Fig. 5. *Average of values of functional scores according to SST*

Table 7
Average of recorded results according to *Canadian Occupational Performance Measure (COPM)*

COPM		Research Lot	Witness Lot
Performance	I	3	3
	F	4,4	4,2
	D	**1,4**	**1,2**
Satisfaction	I	3,6	3,8
	F	4,6	4,4
	D	**1**	**0,6**

Through the comparative analysis of the results obtained by the subjects of both lots, after assessing occupational performance in daily activities (ADL) according to the Canadian Occupational Performance Measure (COPM) we notice a better evolution of the experimental lot, on average by 1,4 points, with regard to performance, as compared to an average of 1,2 points, obtained by the witness lot.

Fig. 6. *Comparative graphic representation of average values obtained according to the Canadian Occupational Performance Measure (COPM).*

The same good evolution can be also noticed with regard to satisfaction, on average by 1 point, in the research lot, as compared to an average of 0,6 points in the witness lot, which shows that the improvement of performance causes a more significant favourable of satisfaction in carrying out daily activities.

6. Conclusions

The starting point of this study was that by combining physical therapy programs with individualized programs of occupational therapy we will be able to emphasize the progress of rehabilitation, by improving the functional level and thus the quality of life of subjects with scapulohumeral periarthritis.

According to recorded results, we can state that the hypothesis is confirmed, by the following:

- progress both of performance and of satisfaction in occupational activities considered primordial by the subjects was greater in the case of the research lot 1,4/1 (performance/satisfaction), as compared to 1,2/0,6 obtained by the witness lot;
- decrease of pain intensity, reflected both in the evolution of the functional score and in performing daily activities, more significant in the research lot (58 units), than in the witness lot (50 units);
- Improving the functional level by 5,2 points in the research lot, to 4,8 points in the witness lot.

In the case of scapulohumeral periarthritis the aspects of functional impotence, of pain, of movement limitation can be recovered totally or partially through individualized kinetic programs and through specific exercises/activities of occupational therapy.

The progress of functional recovery is directly proportional to the severity and age of symptomatology, the period of returning to the previous functional indices being longer, according to the clinical-functional form of the scapulohumeral periarthritis

Occupational therapy helps correct the dysfunctional processes at the shoulder level generated by the algofunctional syndrome specific to scapulohumeral periarthritis, increasing the subject's functional performance, and promotes the wellbeing, the health by engaging in various activities/occupations freely executed with satisfaction.

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