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Influence of the physical therapy on the health and quality of life of the rheumatic patient

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ABSTRACT

Objective: To evaluate the effectiveness of a specific physical therapy treatment on stiffness, pain and quality of life (HRQL) in rheumatic patients.
Methods: Experimental, prospective, longitudinal and intervention study. It involved 29 individuals with a mean age (SD) of 54.16 (11.9) years, belonging to the Salmantina Association of Rheumatoid Arthritis Patients, randomized into 2 groups: treatment (GT) and control (GC). The study analyzed the time in minutes of morning stiffness, pain -using the Downie Scale- and CVRS through the Nottingham Health Profile (NHP) and the Health Questionnaire SF-36 (SF-36). It carries out an individual treatment that includes mainly physiotherapy manual techniques in one or two sessions per week for six months.
Results: The time of early morning stiffness showed a mean (SD) 21.38 (29.99) minutes (GC = 20.38, GT = 22.19), increasing in GC (26.82) and decreasing in GT (12.5). Pain presented at the beginning a mean (SD) 3.6 (2.03) points (GC = 2.85, GT = 4.22) decreasing in GT (3.68) and increasing in GC (3.45). There was an improvement of CVRS in the GT with decreased scores on four dimensions of NHP (pain, sleep, physical mobility and emotional reactions) and increases in SF-36 (physical problems, social function, pain, function physics). In any case the results were statistically significant.
Conclusion: The study cannot conclude the effectiveness of physiotherapy in the treatment of rheumatoid arthritis although the results show a decrease of morning stiffness and pain and increased CVRS, which is clinically interesting.

Influencia de la fisioterapia sobre el estado de salud y la calidad de vida del paciente reumático

Palabras clave:
Artritis reumatoide
Fisioterapia
Dolor
Calidad de vida

RESUMEN

Objetivos: Evaluar la eficacia de un tratamiento de fisioterapia sobre rigidez, dolor y calidad de vida relacionada con la salud (CVRS) en pacientes reumáticos.
Material y método: Estudio experimental, prospectivo, longitudinal y de intervención. Participan 29 sujetos con edad media (SD) de 54,16 (11,9) años, pertenecientes a la Asociación Salmantina de Pacientes con Artritis Reumatoide distribuidos aleatoriamente en 2 grupos: tratamiento (GT) y control (GC). Se valora la rigidez matinal en minutos, el dolor mediante la Escala de Downie y la CVRS a través del Perfil de Salud de Nottingham (NHP) y el Cuestionario de Salud short form-36 (SF-36). Se lleva a cabo un tratamiento individual de fisioterapia que incluye principalmente técnicas manuales en una o 2 sesiones semanales durante 6 meses.
Resultados: La rigidez matinal presentó al inicio una media (SD) de 21,38 (29,99) min (GC = 20,38, GT = 22,19), aumentando en GC (26,82) y disminuyendo en GT (12,5). El dolor presentó al inicio media (SD) de 3,6 (2,03) puntos (GC = 2,85, GT = 4,22) disminuyendo en GT (3,68) y aumentando en GC (3,45).
Se registró una mejora de CVRS en el GT con disminución de las puntuaciones en 4 dimensiones del NHP (dolor, sueño, movilidad física y reacciones emocionales) y aumento en el SF-36 (problemas físicos, función social, dolor, función física). En ningún caso los resultados fueron estadísticamente significativos.

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Conclusión: El estudio no puede concluir la eficacia de la fisioterapia en el tratamiento de la artritis reumatoide aunque los resultados apuntan a una disminución de la rigidez matinal y del dolor y un aumento de la CVRS, clínicamente interesantes.

Introduction

Rheumatic diseases are now the leading cause of morbidity in the Spanish population, with a sociodemographic involvement of over 6 million patients diagnosed. They are responsible for 18% of sick leave permits, as well as temporary disability and health expenditures accounting for more than 0.8% of IBP.[1] Rheumatoid arthritis, which is presented as the more representative disease, reaches an incidence of 20/100.000 cases and a prevalence ranging between 0.5% and 0.8%[2] of the population. This disease has a clear predominance, increased risk and greater severity in females, with a reduced life expectancy from 4 to 10 years, with double the standard mortality rate, leads to severe disability at 10 years in 10% of those affected and permanent disability in 40% of them and an annual health costs estimated at 600 million euros.[3]

Currently, treatment strategies for these diseases are almost exclusively oriented toward the medical-pharmacological area, far from offering the patient the possibility of an interdisciplinary approach to their disease. Rheumatic disease have a wide variety of affections, and with a clear indication for musculoskeletal physiotherapy, but despite of this, there are few studies on the efficacy and effectiveness of physiotherapy applied to rheumatic patients, as well as a lack of the specialized departments in rheumatology physical therapy in Spanish hospitals and a clearly insufficient supply of specialized postgraduate studies in this field.

The main objective of the study is to test if regular and individualized physical therapy reduces stiffness and pain inherent in rheumatic disease and improves the quality of life related to health (HRQOL).

Material and methods

An experimental, prospective, longitudinal and intervention study lasting 7 months was designed.

29 subjects were involved, 6 men and 23 women, diagnosed with rheumatoid arthritis (82.8%) (n=24), psoriatic arthritis (10.3%) (n=3) or juvenile idiopathic arthritis (6.9%) (n=2), with a mean age of 54.16 years (SD 11.9) (95% CI 49.63 to 58.6) belonging to the Association Salmantina of Rheumatoid Arthritis Patients (ASAP), and had given written informed consent to participate in the study. This collaboration was voluntary, once the objectives and methodology was explained to all members of ASAP, which at the beginning of the study had 108 members.

The subjects were distributed through a system of simple randomization into 2 groups: a treatment or intervention group (16 subjects) and a control group (13 subjects). We excluded subjects in a post-operative phase, those who were receiving physical therapy at baseline and those who did not attend any of the proposed assessments. In the control group, we also considered as exclusion criteria any physiotherapy during the period of the investigation, while in the intervention group we established as necessary that the participants had attended at least 60% of treatment sessions. The subjects could obviously not be blinded to treatment because some attended sessions and others not.

Ethical aspects were in accordance to the Helsinki Declaration.

We conducted 2 evaluations, one at baseline and another at the end, both containing the same assessment tests that were conducted and in the same environment at the same time, with the same measuring instruments and by the same examiner who had previously been instructed in the proper use of them and was unaware of the group to which each subject belonged.

Each assessment provided for the assessment of stiffness, pain and HRQOL. In addition, during the initial evaluation we included a questionnaire that gathered demographic data on diagnosis, disease progression, comorbidities, functional status (Barthel Index[4,5] Lawton[6] Scale, etc.). Morning stiffness was assessed in minutes and dominant joint location. The pain was assessed by a numerical scale that conceptualizes pain Downie[7] in numerical terms, and HRQOL was obtained through Nottingham Health Profile[8,9] and SF-36 questionnaires.[10,11]

The physical therapy group intervention was planned individually for each patient, was structured from the initial assessment and according to the availability of the media, suggesting to each subject one or 2 sessions per week for 6 months.

Each session lasted half an hour, in which the therapist's presence and his performance was constant and essentially manual, focusing on exercise therapy techniques such as massage therapy, passive, active-assisted or active-resisted kinesitherapy and not without technical aids as phototherapy, thermotherapy, ultrasound therapy or magnetic therapy.

Since all arthritis regardless of their evolutionary pattern evolve between outbreak periods and periods of remission and with symptoms that are fluctuating, this demanded a daily plan for each patient treatment.

Furthermore, the choice of techniques and dosage of the work took into account individual characteristics such as joint weakness, laxity, deformity, muscle weakness or myotendinous inadequacy.

In no case is asked was there an attempt to modify the drug therapy of the patient as prescribed by his or her doctor, co-existing during the study period, both in the treatment group as in the control group.

The average number of sessions offered to each participant in the treatment group during the intervention period was 30.5 sessions (SD 8.03) (95% CI 25.86 to 35.14) and the average received by each subject was 27.7 sessions (SD 7.62) (95% CI 23.31 to 32.11) with an average attendance of 90.82% of the sessions.

Statistical analysis of data was done using the statistical package of SPSS Statistics 17.0, and established a descriptive and a comparative analysis based on nonparametric tests given the small number of subjects and lack of normality in the data (Mann-Whitney U and Wilcoxon W).

Results

25 patients completed the study, 11 in the control group and 14 in the treatment group. The reasons for abandoning the trial were less than the minimum established attendance to treatment sessions for the treatment group (one subject), entry during a relapse (one subject) or failure to attend the final evaluation (2 subjects).

Table 1
Socieodemographic data of the sample

	Control group	Treatment group
Age, years[a]	55.29 (9.33) [50.38-61.54]	52.70 (13.84) [45.32-60.08]
Marital status[b]		
Single	2 (15.4)	5 (31.3)
Married	11 (84.6)	11 (68.8)
Number of children[a]	1.77 (1.3) [0.98-2.56]	1.50 (2.13) [0.72-2.28]
Work status[b]		
Active	10 (76.9)	7 (43.8)
Unemployed	0 (0)	1 (6.3)
Retired	3 (23.1)	3 (18.8)
Disability	0 (0)	5 (31.3)
Number of job losses[a]	0.38 (0.65) [−0.01-0.78]	1.31 (2.44) [0.01-2.61]
Time since diagnosis, years[a]	12.33 (7.17) [7.78-16.89]	14.69 (12.3) [8.14-21.24]
Age at diagnosis, añosa	42.75 (11.33) [35.55-59.95]	37.38 (17.49) [28.05-46.70]

[a]$\overline{X}$ X(SD) [IC 95%].
[b]Number (percentage).

Table 2
Clinical characteristics of the patients

	Control group	Treatment group
Presence of disease derived pathology[a]		
Yes	3 (23.1)	2 (16)
No	10 (76.9)	14 (87.5)
Associated comorbidity[a]		
Yes	6 (46.2)	8 (50)
No	7 (53.8)	8 (50)
Known onset factor[a]		
Yes	3 (23.1)	5 (31.3)
No	10 (76.9)	11 (68.8)
Family history[a]		
Yes	5 (38.5)	2 (12.5)
No	8 (61.5)	14 (87.5)
Rheumatoid factor[a]		
Positive	9 (69.2)	12 (75)
Negative	1 (7.7)	
NS/NC	3 (23.1)	4 (25)
Progression pattern[a]		
Monophasic	5 (38.5)	5 (31.3)
Evolving	6 (46.2)	10 (62.5)
Aggressive	2 (15.4)	15 (93.8)
Barthel Index[b]	100.00	97.5 (7.52) [93.49-101.51]
Lawton scale[b]	8.00	7.50 (0.81) [7.06-7.94]
Medication at onset[b]		
NSAID	8 (61.5)	10 (62.5)
Steroids	6 (46.2)	6 (37.5)
DMARD	10 (76.9)	11 (68.8)
Biologics	6 (46.2)	7 (43.8)

[b]Number (percentage).
[a]$\overline{X}$ (SD) [IC 95%].

The sociodemographic characteristics of the population and the peculiarities of the disease are presented in [Table 1] and [Table 2], among which are the fact that 75.9% of the sample were married, 58.6% were active, 48.3% worked outside the home, with a low average job loss due to disease of 0.89 (SD 1.37) (95% CI 0.17 to 1.61). All subjects were evaluated at baseline regardless of medical diagnosis, independent of functional level, for basic and instrumental activities of daily living.

Mean time since the onset of diagnosis was 13.68 years (SD 10.31) (95% CI 9.68 to 17.68) and the average age of the subjects at the moment was 39.68 years (SD 15.15) (95% CI 33.80 to 45.55). Only 27.6% of the sample knew the trigger of the disease and 24.1% had a family history. Regarding the presence of other illnesses, we found that 17.2% of the sample showed the disease-associations and 48% had no associated comorbidity.

Rheumatoid factor, one of the diagnostic criteria described by the American College of Rheumatology,[12,13] was positive in 72.4% of cases.

There were no statistically significant differences between the study groups regarding their demographic variables (sex, marital status, etc.) or the characteristics of the disease (diagnosis, evolutionary pattern, etc.). No relationship was found between different medical diagnoses and comorbidities, the trigger for the disease, family history, presence of positive rheumatoid factor or the various drug treatments.

From this we deduce that, at the beginning of the study, the simple was homogeneous with respect to personal, social, work status and disease characteristics.

The results obtained in the different assessments of morning stiffness and pain are listed in Table 3.

Morning stiffness was present at baseline in 55.2% of the participants and in 58.6% at final evaluation. In the control group the initial rate stood at 46.2% and rose to finish at 61.5%; on the contrary, the treatment group reached 62.5% in the first assessment and 56.3% in the second. With regard to its duration, the values ranged from 5 to 120 min, with a mean for both groups of 21.38 min (SD 29.99) (95% CI 9.97 to 32.79) at baseline, and 18.8 min (SD 26.7) (95% CI 7.78 to 29.82) in the final evaluation. In the control group the average baseline duration was 20.38 min (SD 33.94) (95% CI −0.13 to 40.89), and increased in the final evaluation to 6.44 min. In the treatment group the average initial duration was 22.19 min (SD 27.51) (95% CI 7.53 to 36, 84) and decreased to 12.50 min (SD 16.61) (95% CI 2.91 to 22.09), representing an average reduction of 9.69 min.

From the data obtained on the morning stiffness subjects were classified according to whether the duration of rigidity was maintained, increased or decreased, finding in the control group 30.8% of subjects in which the duration of this symptom had increased as it had not fallen in any; on the contrary, in the treatment group it was reduced in 31.1% of the participants. Despite finding no statistically significant differences between groups, at the beginning or end of study, or between the initial and final values in each group, the presence of a percentage of 31.3% of subjects with reduced stiffness in the final treatment group compared to a rate of 30.8% of subjects with an increase in the control group can be considered to be clinically relevant data if we take into account that in the treatment group symptom duration decreased on average 9.69 min and the control group it increased on average 6.44 min.

Pain during the baseline assessment showed an average of 3.6 points (SD 2.03) (95% CI 2.83 to 4.37) and remained constant in the final interview. In the control group the initial average stood at 2.85 points (SD 1.64) (95% CI 1.85 to 3.84) and increased to 3.45 points (SD 2.08) (IC 95% 2.06 to 4.85) in the final evaluation. In contrast, the initial mean pain score in the treatment group reached 4.22 points (SD 2.16) (95% CI 3.07 to 5.37), and experienced a decline to 3, 68 points (SD 2.00) (95% CI 2.53 to 4.83) in the final evaluation. Qualitatively it was observed that in the control group, 53.8% of subjects stated that their pain had increased during the study period, whereas in the treatment

Table 3
Comparison of the morning stiffness and pain values between study groups

	Control group		Treatment group	
	Baseline	Final	Baseline	Final
Morning stiffness[a]				
Yes	6 (46.2)	8 (61.5)	10 (62.5)	9 (56.3)
No	7 (53.8)	3 (23.1)	6 (37.5)	5 (31.3)
Morning stiffness, min[b]	20.38 (33.94) [−0.13-40.89]	26.82 (35.02) [3.29-50.34]	22.19 (27.51) [7.53-36.84]	12.50 (16.61) [2.91-22.09]
Pain (Points on the Downie numerical scale)[b]	2.85 (1.64) [1.85-3.84]	3.35 (2.08) [2.06-4.85]	4.22 (2.16) [3.07-5.37]	3.68 (2.00) [2.53-4.83]

[b]Number (percentage).
[a]$\overline{X}$ (SD) [IC 95%].

group 50% of the sample stated that their pain had decreased. As in the previous case we found no statistically significant differences in pain assessments between the study groups, or between the initial and final values of these, nor were any seen between the symptom score and gender or diagnosis. However, a decrease of 0.54 points on average in the treatment group compared with an increase of 0.6 points on average in the control group are clearly results of clinical interest.

The results of questionnaires of HRQOL assessment reveal evidence of a clear effect on the health status of the individuals. The overall scores of the Nottingham Health Profile, inversely related to the health of the patient, at baseline ranged between 1.38 points and 34.06 points, being the most affected dimensions those of pain, sleep and mobility. In the final evaluation of the control group, slight decreases were observed in 2 of the areas considered (emotional reactions and social isolation) and increases in the other 5, while in the treatment group improvement was reflected in 6 dimensions, highlighting differences up 19.77 points in the dimension of pain, 11.11 points on the sleep dimension, 5.59 points in the dimension of physical mobility and 5.59 points in the dimension of emotional reactions. Despite its clinical relevance, the results did not show, again, statistically significant differences between groups and evaluations (Table 4). As for the SF-36, whose score is related in direct proportion to the subject's health status, we saw differences between the 2 groups of 47.59 points and 86.21 points at baseline in the dimensions of general health perception, pain and vitality. Here there was also no statistically significant differences between both study groups, although the control group had slightly higher values than the treatment group. The final evaluation in the treatment group showed improvement in 7 of the areas considered, with a difference of 24.28 points in the dimension of physical problems, of 13.34 in the social functioning dimension, 10.96 in the dimension of pain and of 8.36 in physical functioning dimension. In contrast, the control group showed higher values in 3 of the major areas, and substantially worse in the remaining 6 (Table 5). In any case, the differences between initial and final assessment were statistically significant, but those clinically relevant were the ones in the treatment group.

Discussion

The effectiveness of physiotherapy in the treatment of stiffness, pain and quality of life of arthritis patients could not be revealed with this study, and although the results were not statistically significant and clinical aspects questionable, we believe that physiotherapy can reduce morning stiffness in more than 30% of subjects and pain in more than 50% of them making it an interesting therapeutic strategy to be tested through further studies in which one should try to solve the constraints seen by us.

The main limitation of this study is the low statistical power due no doubt to the small number of subjects in the sample and its variability. The small number of subjects was dictated by a convenience sample, obtained from a partnership in which all members were able to participate but where the proportion of volunteer participants was 26.9%.

However, we must consider and assess, when the time comes, that a major difficulty in conducting studies with larger samples in order to study the effectiveness of physiotherapy is the high cost required for the involvement of professionals during a period of not less than 30 min per patient per session and for long periods of time.

Table 4
Comparison of the Nottingham health profile values between study groups

	Control group		Treatment group	
	Baseline	Final	Baseline	Final
Energy[a]	20.25 (31.65) [1.12-39.37]	22.55 (30.05) [2.36-42.73]	22.15 (26.23) [8.18-36.12]	18.51 (22.76) [5.37-31.65]
Pain[a]	24.63 (26.12) [8.85-40.41]	26.93 (26.85) [8.90-44.98]	41.73 (23.62) [29.15-54.31]	21.96 (23.13) [8.61-35.32]
Physical mobility[a]	23.00 (18.54) [11.79-34.21]	26.78 (17.94) [14.73-38.83]	31.07 (15.12) [23.01-39.13]	25.32 (12.23) [18.26-32.38]
Emotional responses[a]	24.2 (19.25) [12.57-35.83]	19.98 (11.76) [11.86-27.66]	22.37 (25.28) [8.90-35.85]	16.79 (20.80) [4.78-28.79]
Sleep[a]	32.18 (34.68) [11.23-53.14]	34.53 (34.93) [11.07-58.00]	33.90 (31.87) [16.92-50.88]	22.79 (31.40) [4.66-40.91]
Social isolation[a]	4.88 (12.46) [−2.70-12.46]	2.00 (6.63) [−2.46-6.46]	2.26 (6.21) [−1.05-5.57]	4.79 (9.51) [−0.70-10.28]
No. of affected areas[a]	0.85 (1.07) [0.20-1.49]	1.273 (1.56) [0.23-2.31]	1.81 (1.87) [0.81-2.81]	1.07 (0.92) [0.54-1.60]

[a]$\overline{X}$ (SD) [IC 95%].

Table 5
Comparison of values of the SF-36 questionnaire between the study groups

	Control group		Treatment group	
	Baseline	Final	Baseline	Final
Physical function[a]	66.54 (22.95) [52.67-80.41]	73.64 (20.13) [60.11-87.16]	51.25 (24.67) [38.12-64.40]	59.61 (24.16) [45.05-74.18]
Physical problems[a]	86.54 (24.18) [71.92-101.15]	61.36 (37.69) [36.04-86.68]	46.87 (46.43) [22.13-71.61]	71.15 (36.58) [49.05-93.26]
Pain[a]	56.15 (19.73) [44.23-68.07]	63.41 (16.86) [52.09-74.73]	47.50 (22.00) [35.77-59.22]	58.46 (21.59) [45.41-71.51]
Social function[a]	79.81 (26.29) [63.92-95.70]	70.46 (23.90) [54.40-86.51]	70.31 (22.30) [58.43-82.20]	83.65 (17.22) [73.25-94.06]
Mental health[a]	63.08 (14.62) [54.24-71.91]	65.09 (15.08) [54.96-75.22]	73.00 (18.21) [63.29-82.70]	69.54 (23.24) [55.49-83.58]
Emotional problems[a]	92.31 (19.98) [80.24-104.38]	66.67 (39.44) [40.17-93.17]	81.26 (29.73) [65.41-97.10]	76.92 (43.85) [50.42-103.42]
Vitality[a]	58.08 (26.97) [41.78-74.37]	57.73 (19.92) [44.35-71.11]	48.75 (18.75) [38.85-58.65]	55.77 (16.81) [45.61-65.93]
General health perception[a]	50.00 (19.47) [38.23-61.77]	50.00 (17.17) [38.46-61.54]	45.62 (20.56) [34.67-56.58]	47.69 (24.55) [32.86-62.53]
Health changes over time[a]	53.85 (30.36) [35.50-72.19]	40.19 (20.23) [27.32-54.50]	53.12 (17.97) [43.55-62.40]	54.23 (21.97) [40.95-67.51]

[a] $\overline{X}$ (SD) [IC 95%].

The fact that we included patients with different diagnosis was with the idea of trying to increase the number of participating subjects, although this represents a deterioration of the homogeneity of the sample, which otherwise is also influenced by the great disease variability between persons. Despite the small number of subjects, the sample distribution by sex is in line with Spanish epidemiological trends, the prevalence of female triple the male as the PPE (Prevalence of rheumatic diseases in the Spanish Population) 2 study concludes, published by the SER in 2002 and Study on Costs Associated with Rheumatoid Arthritis[14] developed in the Clinical Hospital San Carlos de Madrid in 2003. Similarly, there was a correspondence in the prevalence of disease by age group, being the most representative 40-60 years of age.[15]

One of the most important aspects of the results were the improvements registered in some of the dimensions of the HRQOL, which patients subjectively emphasize throughout therapy and during the final evaluation, something that limited blinding of the observer.

The quality of life of patients in the sample, as assessed by the SF-36, showed slight differences with the studies of Talamo et al[16] and Route et al[17] in which subjects had worse quality of life values except for dimensions of mental health and general health perception where the values were similar. They are also significantly better values obtained in the dimensions mobility, pain and energy of the NHP questionnaire than those reported by Uutela et al[18,19] for the Finnish population.

We did not find other studies in the literature with results similar to ours in terms of individual adaptation of treatment based on the patient's daily symptoms and the selection of techniques based on specific objectives and daily treatment. The reviewed studies used isolated physiotherapy techniques such as thermotherapy,[20,21] cryotherapy,[22,23] kynesitherapy,[24] baths,[25] phototherapy,[26] ultrasound[27] therapy, massages[28] and electrotherapy,[29] dealing of their effects on pain, range of motion, muscle strength, etc., in rheumatoid arthritis, reporting in many cases little evidence.[20,29]

The initial study design included interim evaluations, the results have finally been not been provided because of the great variability reported in daily symptoms presented by the patients involved and the lack of conclusions.

The descriptive results included contain the description of the medication ingested by the participants, but it was never used as a marker in the improvement of symptoms and HRQOL because in most cases it was scheduled medication by the specialist with treatment reviews after long periods of time.

Conflict of interest

The authors declare no conflict of interest.

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