

INFLUENCE OF JOINT DAMAGE ON FUNCTIONAL CAPACITIES IN PATIENTS SUFFERING FROM RHEUMATOID ARTHRITIS

Nela Živković, Aleksandra Stanković, Ivana Krstić, Tomislav Kostić and Nataša Ilić

Evaluating functional status in the patients with rheumatoid arthritis defines the presence of functional limitations and incapacitation. Patients' ability to perform daily activities is reduced during the disease, and parameters influencing its reduction are numerous.

The aim of this investigation was to examine the relation between joint damage and functional capacities of patients suffering from rheumatoid arthritis.

The analysis involved 98 patients with rheumatoid arthritis treated at the Institute «Niska Banja». The examinees' HAQ score was determined, after which they were separated into three functional groups, while standard hands and feet radiography determined the level of radiological damage (Larsen score). The majority of patients (41,8%) were characterized by functional disability (HAQ>2,01). The difference in values of Larsen score between the HAQ groups was statistically significant ($p<0.001$). There was no statistically significant association between the HAQ score and length of disease ($p>0.05$). The investigation showed that the increase of joint destruction reduces functional ability of patients with rheumatoid arthritis. *Acta Medica Medianae 2009;48(2):18-21.*

Key words: functional ability, joint damage, rheumatoid arthritis

Institute for Prevention, Treatment and Rehabilitation of Rheumatic and Cardinal Patients „Niška Banja" in Niška Banja¹
Cardiology Clinic, Clinical Centre Niš²

Contact: Nela Živković
Prosvetna 25
18205 Niška Banja, Serbia
018/2548-020, 063/8854566

Introduction

Disease progression, chronic joint inflammation and consequent joint damage make rheumatoid arthritis have a significant influence over the quality of life. In most patients, this is a serious disease during which joint damage progresses; working capacity and ability to take care of oneself are weakened or completely lost, which leads to social and financial dependence of patients and shorter life expectancy. After comprehending that they are suffering from rheumatoid arthritis, the largest number of patients is interested in disease prognosis and to which extent their life will be changed. Will the disease influence their everyday activities? Will the disease influence their working capacity? Will and to which extent the disease influence their sexual abilities, mental health, and social life?

Evaluation of the functional status of the locomotor system is of special importance, not only from the medical, but also from the social-economic aspects. Evaluating this status enables

us to observe the current patient's abilities and to define the presence as well as the degree of functional limitations and incapacitations. Unfortunately, the knowledge on the influence of rheumatoid arthritis on individual's physical capacity is very poor, the biggest problem being its assessment (1).

Physical ability of patients suffering from rheumatoid arthritis is reduced during the disease, and it starts by functional limitation and ends in complete physical incapacitation. At the beginning of the disease, the level of functional capacity is the greatest predictor of functional incapacitation in later phases (2). Some researches have shown that patients' functional incapacitation depends mainly on joint destruction (3). ERAS study group points out that in 32% of patients changes are noticed in the initial phase of the disease, whereas after the third year the joint damage was registered in 70% of examinees (4). Joint damage constantly progresses during the first 20 years and accounts for 25% of functional incapacitation of RA patients. Reduction in functional abilities of RA patients is related to high Larsen scores (5).

Aims

The aim of the paper was to determine the influence of joint damage on functional status of patients with rheumatoid arthritis.

Patients and methods

Investigation included 98 patients diagnosed with rheumatoid arthritis and chosen randomly, according to ACR (American College of Rheumatology, 1992) criteria. Investigation was conducted as analytical cross-sectional study.

Anamnesis was taken from all the patients, detailed clinical examination was performed as well as standard hand and feet radiography in posterior- anterior projection; each patient's functional capacity was assessed.

Based on hand and feet radiography, the structural damage of minor joints of hands and feet as well as of wrists was evaluated. The used method was Rau and Sherborn's from 1995, which represents a modification of Larsen method including thirty two joints: 8 proximal interphalangeal, 2 interphalangeal, 10 metacarpophalangeal, both wrists and 10 metatarsophalangeal joints. Each joint is graded from 0 to 5:

0. degree: normal results

1. degree: swelling of soft tissue, insignificant narrowing of joint space and subchondral osteoporosis

2. degree: erosion with destruction of joint surface $\leq 25\%$

3. degree: erosion with destruction of joint surface 26-50 %

4. degree: erosion with destruction of joint surface 51-75 %

5. degree: erosion with destruction of joint surface $>75\%$

Larsen score is the sum of values of thirty two localizations and has a range from 0 to 160 (6).

Functional capacity of patients was determined based on the Health Assessment Questionnaire (HAQ), which was filled in by patients themselves. This questionnaire had twenty questions, grouped in 8 categories related to various life activities: getting dressed and personal hygiene, getting up and eating, walking, catching items, grasping and activities.

Patients had a choice of four answers for each question, each answer was graded from 0 to 3, where: 0- easily performed, 1- performed with some difficulty, 2- performed with a lot of difficulties, 3- cannot be performed. Answer which was graded highest in one question category was used for the given function. Based on the patients' answers, HAQ index which represents quotient of the sum of the highest grades in question groups and category number, i.e. 8 was determined. HAQ score was graded from 0 to 3, where higher HAQ values pointed to the harder functional limitation (7).

HAQ index has three gradations: moderate incapacitation (moderate decrease of every day functions) will have the index grade 0 to 1, grade 1,01 to 2 will point to a heavier incapacitation (more serious functional damage), and grade 2,01 to 3 complete physical incapacitation with necessity of other's assistance. In this way, three functional groups were obtained:

I group- moderately reduced everyday functions

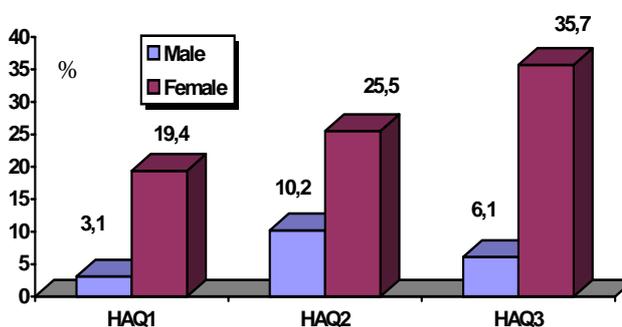
II group - more serious damage in all segments

III group - functional incapacitation of the examinees

Results

Of 98 examined patients 79 were women and 19 men. Average age of the female examinees was $59,03 \pm 10.36$ years, while the average age of the male examinees was $60,79 \pm 10.21$ years. Age interval of the examined patients ranged from 27 to 79 years.

Gender structure of the patients by HAQ score is shown on Graph 1. What is obvious is female predominance in each examined group, but gender distribution was approximately the same in all groups.



Graph 1: Schedule distribution of examinees by HAQ groups

Twenty two patients (22,5%) had HAQ score $<1,01$ and moderately reduced everyday life functions; 35 patients (35,7%) had HAQ score from 1,01 to 2, which points to a more serious damage, while the greatest percentage (41,8%) of the patients was characterized by functional incapacitation ($HAQ > 2,01$) (Graph 1).

Table 1: Values of Larsen score in examined groups

HAQ group	1	2	3	Total
N	22	35	41	98
Mean	26.86 ^{ab}	43.51	58.10	45.88
S d	15.46	23.65	29.03	27.25
KV	57,56	54,36	49,97	59,39
Me	30	41	56	46.5
Mo	38	26	56	56
Min	0	7	0	0
Max	59	110	125	125
Kruskal Wallis test	$\chi^2 = 19.805$ $p < 0.001$			

ap <0.001 (I vs. III group)

bp <0.01 (I vs. II group)

Individual comparison of the groups showed that two groups had significant differences, where the second and the third group had a border significant difference, while high statistical

difference was found between the first and the third group ($p < 0.001$) (Table 1).

We noticed that the degree of the destructed joint changes (Larsen score = 43, 51 and 58, 10) was higher in patients with medium and high degree of functional damage when compared to the patients with moderate reduction of functions.

As RA is a progressive disease, the length of the disease was also taken into consideration. The average length of the disease for patients of both sexes of all HAQ groups ranged from 6.77 ± 5.31 years for the first group and to 7.42 ± 8.72 years for the third group. There was no statistically significant association between HAQ score and the length of the disease.

Discussion

RA is a chronic, progressive and destructive disease. Functional ability is quickly reduced, in some cases leading to complete disability. Researches have shown that various parameters influence the functional capacity, joint damage being one of the most important.

Inflammation of synovia in RA leads to destruction of the joint cartilage and the surrounding bone. The stated changes can be quantified and expressed by Larsen score (8) based on the radiographies. Average Larsen score in our examinees was 45, 88, which makes approximately 30% of maximum score and points out to the presence of the medium degree of joint destruction. It was found that patients with greater functional damage had higher Larsen score.

Results of numerous studies have shown that joint damage and functional capacity are not related in the early phase of the disease. This was confirmed by the authors of the study (9) who state that the ratio of joint damage and HAQ score is irrelevant at the beginning of the investigation, while after twelve years of monitoring their ratio was extremely visible. In the initial phase of RA, joint damage and HAQ score were not related (5). However, between the 5th and 8th year of the disease there is a significant relation to the correlation coefficient between 0, 30 and 0, 50. In the later phases of RA (after 8 years), there is a significant correlation with the correlation coefficient between 0, 30 and 0, 70. Unlike them, Breedweld et al. showed that greater joint damage at the beginning of the investigation was the reason of greater functional incapacitation in the later phases of the disease (10).

Still, there are researches which show that structural joint abnormality does not have a significant influence on the patients' functional capacity. In the ten-year follow-up of 112 patients (11) the authors did not find any association between HAQ score and radiographic damage. Inconsistency of the obtained results with most of the previous ones was explained by early commencement of treatment by modifying medications.

Even though our results can be compared to most results of other researchers, it should be emphasized that inconsistency of the results is often present. Radiographic scoring system offers information on the presence and level of joint damage, as well as the opportunity of following the effects of the applied treatment. However, in many cases, the data from one research cannot be directly compared with other researches, especially if a different score system was used or if the examinees' features were different while joining the study.

Literature data have shown that functional capacity decreases during the disease. Research conclusion (5), the aim of which was to compare the results of various studies from different research centers, shows that functional incapacitation grows as the disease progresses through time, where the increase is constant. However, it is surprising that we did not register the significant influence of the disease duration on the distribution of examinees by functional groups. This inconsistency can be explained by short disease duration (7.24 years) compared to the literature data which say that the difference in functional capacity of the patients is visible only after 8 years from the beginning of disease.

Ability of RA patients to perform various everyday activities reduces in time. Due to strong pain, damages and joint deformities, these patients cannot perform ordinary house chores and have problems in relationship with friends and family (12). That is why there is the need to improve knowledge on the nature of the disease and its destructive influence on physical capacity of an individual.

Conclusion

Presented results show that with the increase in the degree of joint damage, functional capacities of patients with rheumatoid arthritis decrease.

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UTICAJ OŠTEĆENJA ZGLOBOVA NA PROMENU FUNKCIONALNOG KAPACITETA BOLESNIKA SA REUMATOIDNIM ARTRITISOM

Nela Živković, Aleksandra Stanković, Ivana Krstić, Tomislav Kostić i Nataša Ilić

Ocenjivanjem funkcionalnog statusa bolesnika sa reumatoidnim artritisom definišemo postojanje funkcionalne ograničenosti i onesposobljenosti. Sposobnost bolesnika da obavljaju svakodnevne aktivnosti smanjuje se u toku bolesti a parametri koji utiču na njeno smanjenje su mnogobrojni.

Cilj ovog rada bio je da se ispita odnos zglobnog oštećenja i funkcionalnog kapaciteta obolelih od reumatoidnog artritisa.

Analizom je obuhvaćeno 98 bolesnika sa RA koji su lečeni na Institutu Niška Banja. Ispitanicima je određen HAQ skor na osnovu koga su podeljeni u tri funkcionalne grupe, dok je standardnom radiografijom šaka i stopala određen nivo radiološkog oštećenja (Larsen skor). Najveći procenat (41,8%) bolesnika je karakterisala funkcionalna nesposobnost (HAQ>2,01). Razlika prosečnih vrednosti Larsen skora među HAQ grupama bila je statistički značajna (p<0.001). Nije postojala statistički značajna povezanost HAQ skora sa dužinom trajanja bolesti (p>0.05). Zaključili smo da se sa povećanjem zglobne destrukcije smanjuje funkcionalna sposobnost bolesnika sa RA. *Acta Medica Medianae* 2009;48(2):18-21.

Ključne reči: funkcionalna sposobnost, oštećenje zglobova, reumatoidni artritis