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RESEARCH ARTICLE

Prevalence of Metabolic Syndrome in Psoriatic Arthritis and Rheumatoid Arthritis

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Introduction: The psoriatic patients have an increased number of associated comorbidities. Of these, cardiovascular diseases present the highest incidence and severity. The understanding of the cardiovascular risk in patients with psoriatic arthritis was supported from the rheumatoid arthritis studies that suggested that patients with psoriatic arthritis have a risk of cardiovascular diseases similar to patients presenting rheumatoid arthritis. The presence of the metabolic syndrome further increases the risk of cardiovascular disease. The purpose of this study was to determine the prevalence of metabolic syndrome and its components in two groups of patients: those presenting psoriatic arthritis and those with rheumatoid arthritis.

Material and method: The study included two groups of patients: group one - 40 patients with psoriatic arthritis defined by Moll and Wright criteria, respectively the group two - 51 patients with rheumatoid arthritis defined by American College of Rheumatology (ACR) criteria. The metabolic syndrome was defined according to the consensus definition (incorporating IDF and American Heart Association/National Heart, Lung and Blood Institute -AHA/NHLBI definitions).

Results: We enrolled in the study 91 patients having a mean age of 57.7±10.4SD (54.7±10.2 SD psoriatic arthritis, 60.01±10.0 SD rheumatoid arthritis). The mean disease duration (years) was 4.12±4.1SD for psoriatic arthritis and 6.7±7.8SD for rheumatoid arthritis. The prevalence of the metabolic syndrome was 67.5% in the group with psoriatic arthritis and 37.2% in patients with rheumatoid arthritis. The psoriatic patients had a higher prevalence of impared fasting glucose (52.5% vs 27.4%, p=0.018), and elevated trygliceride values as compared with those presenting rheumatoid arthritis (25% vs 11% p=0.0004).

Conclusions: The prevalence of metabolic syndrome is increased in patients with psoriatic arthritis as compared to patients with rheumatoid arthritis.

Keywords: metabolic syndrome, psoriatic arthritis, rheumatoid arthritis

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Introduction

The psoriatic patients have an increased number of associated comorbidities [1]. Of these comorbidities, cardiovascular diseases present the highest incidence and severity [2]. The understanding of the cardiovascular risk in patients with psoriatic arthritis (PsA) was supported by the rheumatoid arthritis (RA) studies that suggested that patients with PsA have a risk of cardiovascular disease similar with those who have RA [3]. An increasing number of studies showed that patients with PsA present a higher cardiovascular risk, mostly caused by an accelerated atherosclerosis progression [4, 5].

The metabolic syndrome (MS) is represented by the association of several clinical and metabolic modified elements that are predictive for cardiovascular diseases. These abnormal elements include the abdominal obesity, high level of triglyceride value, low level of HDL-cholesterol, high fasting blood glucose and high blood pressure, features that represent cardiovascular risk factors of metabolic origin that tends to cluster in individuals [6].

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The aim of this study was to assess the prevalence of the MS in PsA and RA patients and to compare the prevalence of traditional risk factors and the metabolic syndrome. Our purpose was to determine if the MS is present in a higher extend in patients with PsA than in those with RA.

Material and Methods

In our retrospective study we have enrolled a total number of 91 patients with ages between 32 and 79 years, diagnosed with PsA and RA in the Clinic of Rheumatology Targu Mures, over a period of 2 years, from 2011 to 2013. The patients were divided in 2 groups: in the first group we enrolled the PsA patients that fulfilled the Moll and Wright criteria and in the second group the RA patients who were previously diagnosed on the basis of ACR criteria 1997. Patients that were diagnosed with other rheumatic diseases and the patients who refused to participate in the study were excluded from the study. Data collected and analysed included demographic data (age, gender), smoking status, history of the joint disease (onset, duration, medication) and the presence of cardiovascular diseases.

Informed consent was obtained from all the patients before they were included in the study.

The fasting blood sugar (FBS), erythrocyte sedimentation rate (ESR), total cholesterol, triglycerides and HDL-cholesterol were determined to each participant after an overnight fasting.

Anthropometric measurements performed included: height, weight, waist circumference and blood pressure. The body mass index (BMI) was calculated using the formula: BMI=weight (kg)/height^2 (m^2). MS was defined as the presence of 3 or more components of the diagnostic criteria developed by the Consensus of the International Diabetes Federation (IDF) and American Heart Association/National Heart, Lung, and Blood Institute (AHA/NHLBI), 2009: (1) waist circumference (European population): women ≥80cm and men ≥94cm, (2) high triglycerides levels ≥150mg/dl, (3) low HDL cholesterol levels for women ≤50mg/dl and for men ≤40mg/dl, (4) fasting blood sugar ≥100mg/dl, and (5) systolic blood pressure and/or diastolic ≥ 135/85mmHg. The disease activity was determined using DAS28 formula based on ESR, number of tender joints (NTJ), number of swollen joint (NSJ) and visual analogue scale (VAS) evaluated by the patients.

Statistical analysis was carried out using the GraphPad Prism 3 and Microsoft Office 2007 software package. Continuous data were described by means and SD, and categorical variables as percentages. Comparisons between the two categories were made using two-tailed t tests for continuous variables and by the Fisher test for categorical variables. When the sample data were not normally distributed we have used Mann-Whitney test. When needed, correction Welch test was performed. Differences in continuous variables between groups were assessed with one-way ANOVA test. A p value <0,05 was considered statistically significant.

Table I. Demographic and disease data of the patients with psoriatic arthritis and rheumatoid arthritis taken in study.

	Psoriatic arthritis (N=40)	Rheumatoid arthritis (N=51)	p value
Female - N (%)	25 (62.5%)	44 (86.27%)	0.013
Men - N (%)	15 (37.5%)	7 (13.72%)	0.018
Age, mean ±SD	60.1±9.8	55.2±9.6	0.018
Age, psoriasis onset, mean±SD	37±17.86		
Psoriasis duration (years), mean±SD	18.22±14.47		
Age, arthritis onset	51.27±10.67	50.07±10.8	0.599
Arthritis duration (years), mean±SD	4.2±4.08	10.39±8.36	<0.0001

Table II. Cardiovascular risk factors mean value in the group of patients with psoriatic arthritis and rheumatoid arthritis.

	Psoriatic arthritis (N=40)	Rheumatoid arthritis (N=51)	p value
HDL cholesterol, mean value±SD	52.9±16.3	56±18.6	0.41
Total cholesterol, mean value±SD	204±40.5	200.4±43.7	0.68
Fasting bood glucose, mean value±SD	85±55.1	97.4±20.1	0.140
Tryglicerides, mean value±SD	187.5±125.7	124.6±47.6	0.0015
Uric acid, mean value±SD	4.7±1.7	3.9±1.2	0.008
Body mass index, mean value±SD	30.6±5.4	26.8±4.6	0.0005
Systolic blood pressure, mean value±SD	140.4±21	136.1±16.3	0.28
Diastolic blood pressure, mean value±SD	85.5±9.7	82.0±7.7	0.05
Smokers number (%)	15 (37.5%)	21 (43.13%)	

Results

The analysis of demographic data shows that RA patients had a higher mean age then those with PsA. The PsA patients were younger then RA patients and presented an almost equal distribution on gender with a slight domination of the females (51.85% vs 48.14%). In contrast, in RA group there is a strong domination of the female gender (89.47%) (Table I). From the descriptive characteristics of the 2 groups we have found that the PsA patients had a higher BMI and a higher mean value of blood pressure. A lower proportion of PsA patients were smokers as compared with the RA group. Also, higher values of the total cholesterol, triglycerides, uric acid, FBS and HDL-cholesterol were recorded in the PsA group (Table II). The disease data shows that the mean age at the onset of the joint disease had been almost equal in the two groups: 50.07±10.8 years in RA group, respectively 51.27±10.67 years in PsA group, mentioning that the onset of the skin disease in the PsA group was earlier at a mean age of 37±13.8 years, the mean age value being 41 years. The mean duration of the joint disease in PsA group was 4.2±4.08 years and in RA group was 10.39±8.36 years, the first group having a mean duration of skin disease about 18.22±14.47 years.

From the total number of 91 patients enrolled in study, 46 patients had MS according to IDF-AHA consensus definition, 27 patients from the PsA group and 19 patients from the RA group (Table III). In the PsA group, MS was defined by 3 components in 35% cases, by 4 components in 17.5% cases, respectively 15% having 5 components present. In contrast to PsA, in RA the MS had lower proportions: 3 components in 21.56% cases, 4 components in 11.76% cases and 3.92% cases had all 5 components (Table IV). In RA with MS the number of patients with high blood pressure and low HDL-cholesterol was higher these patients presented a greater inflammation, higher

Table III. Prevalence of metabolic syndrome depending on the definition criteria used on evaluation.

Metabolic syndrome according with defining criteria	Psoriatic arthritis (N=40)	Rheumatoid arthritis (N=51)	p value
NCEP/ATP III 2001	25 (62.5%)	12 (23%)	0.0002
IDF	25 (62.5%)	18 (35.2%)	0.01
AHA/NHLBI	27 (67.5%)	14 (27.4%)	0.0003
Consensus IDF-AHA/NHLBI 2009	27 (67.5%)	19 (37.2%)	0.005

Table IV. The number of components that defined metabolic syndrome in the group of psoriatic arthritis and rheumatoid arthritis.

Number of components	Psoriatic arthritis	Rheumatoid arthritis
3	14 (35%)	11 (21.56%)
4	7 (17,5%)	6 (11.76%)
5	6 (15%)	2 (3.92%)

Table V. The characteristics of patients with psoriatic arthritis and rheumatoid arthritis in the presence of the metabolic syndrome.

	Psoriatic arthritis (N=27)	Rheumatoid arthritis (N=19)	P value
Age, mean value±SD	55.74±8.40	61.105±9.21	0.0465
Duration disease, mean value±SD	3.92±3.88	10.526±8,29	0.0008
Female number (%)	15 (55.55%)	17 (89.47%)	
Male number (%)	11 (40.74%)	2 (10.52%)	
BMI, mean value±SD	32.15±5.07	28.67±4.97	0.0257
Smoker, N (%)	11 (40.74%)	13 (68.42%)	0.0797
Previous cardiovascular disease, N (%)	20 (74%)	18 (94.73%)	0.1152
DAS 28, mean value±SD	4.89±1.04	5.36±1.001	0.1385
ESR (mm/h), mean value ±SD	23.85±12.37	35±22.42	0.0360
CRP positive, N (%)	10 (37.03%)	16 (84%)	0.0023

activity disease (DAS28), and also a higher mean duration of the disease as compared to PsA patients with MS (Table V). Analysing the individual components of MS in these two groups we have found that PsA patients with MS had a higher proportion of abdominal obesity (96.29%), elevated triglyceride values (77.77%) and FBS (66.66%) as compared to RA and MS patients (Table VI). The risk factors for metabolic syndrome in PsA patients and in RA patients are presented in table VII.

Table VI. Prevalence of the metabolic syndrome components according to the consensus IDF-AHA.

Metabolic components	Psoriatic arthritis (N=27)	Rheumatoid arthritis (N=19)
Abdominal obesity N (%)	26 (96.29%)	17 (89.4%)
Tryglicerides, high- N (%)	21 (77.77%)	10 (52.63%)
HDL- cholesterol low N (%)	12 (44.44%)	10 (52.63%)
Fasting blood glucose N (%)	18 (66.66%)	11 (57.89%)
Blood pressure N (%)	23 (85.18%)	17 (89.4%)

Discussions

The high prevalence of MS in the general population and the high cardiovascular risk makes from MS one of the major health problems. In this study we observed a significantly higher prevalence of the MS in patients with PsA compared to RA patients independently of which definition criteria were used (IDF, AHA/NHLIB, NCEP/ATP III- National Cholesterol Education Program Adult Treatment Panel III, consensus IDF-AHA/NHLIB) (Table III). In our study the prevalence of MS in PsA is significantly increased, over 60%, independently of the definition criteria. Similar data were obtained in Raychauhuri et al study (2010), the prevalence of metabolic syndrome in psoriatic arthritis being 58.1% in accordance with AHA/NHLBI criteria [7]. In RA the obtained MS prevalence was between 23% and 37.2% with a maximum value reached by Consensus IDF-AHA definition, the MS prevalence varying depending on definition criteria applied. This prevalence is similar to that revealed in other studies, being between 20-40% [8,9,10]. In Mok's study [11], the MS prevalence in PsA group was only about 38%, but significantly higher than the prevalence obtained in RA patients, which is 20%. Our study supports the Mok's observations that MS has a higher prevalence in PsA then RA. In our study the prevalence of MS was much higher comparing to other studies [11], probably due to racial factors and definition. According to the ROMES study (Romanian Multicentric Study of the Prevalence of Metabolic Syndrome) in a cohort of romanian healthy population, the MS prevalence is higher according to NCEP- ATP III definition (40.6%), similarly to IDF definition (44.2%), the prevalence of MS being higher in female gender [12]. Although there are studies that demonstrate a higher prevalence of MS in RA compared to healthy controls [11], the prevalence of RA obtained in our study was lower then the one obtained in the ROMES study. Increased abdominal obesity is the most proeminent component of MS that we found in PsA group (96.28%), also high triglycerides levels are very often met (85.18%). In RA the abdominal obesity and high blood pressure had high prevalence (89.4%) too. In our study the prevalence of the metabolic syndrome is higher in men with PsA (55.55%) compared to RA. It was also found that patients with PsA and MS were older and had

Table VII. Risk factors for metabolic syndrome in psoriatic arthritis and rheumatoid arthritis patients.

		PsA with MS	PsA without MS	P value	RA with MS	RA without MS	P value
Age, mean±SD		52.18±9.2	49.38±14.3	0.44	61.1±9.2	59.5±10.3	0.601
Duration, mean±SD		3.92±3.8	4.76±4.5	0.54	10.5±8.2	10.3±8.5	0.930
DAS 28±SD		4.88±1.1	4.55±0.87	0.34	5.36±1.0	5.11±0.98	0.402
ESR±SD		23.85±12.3	16.46±9.3	0.064	36.89±25.1	29.7±12.5	0.218
BMI ±SD		32.15±5.07	27.57±5.02	0.01	28.6±4.9	25.1±5.7	0.032
gender	Men – N	14	8	0.73	2	5	0.69
	Women – N	13	5		17	27	
Smoking N (%)		11(40.7%)	4(30.7%)	0.73	13(68.4%)	9(28.1%)	0.0082

a higher disease activity and inflammation then patients with PsA without MS. The same findings were obtained in RA with MS versus RA without MS. We did not observe any correlation between the presence of MS and age, disease duration, disease activity, inflamation and smoking habit in PsA patients. In contrast to our finding, in a study about PsA it has been showed that MS duration correlates well with the duration of the disease [13,14]. In another study, Sahebary et al [15] did not obtain any correlation between the disease severity and the presence of MS. In our study BMI was correlated with the MS presence in PsA (p=0.0107) and in RA (p=0.0328), in the same time identifying a correlation with the smoking habit in the second group (p=0.0082). When we compared the two groups of patients, we noticed that the patients with PsA and MS had lower age (p=0.0465), shorter disease duration, lower disease severity and inflammation then patients with RA and MS, togethre with a higher prevalence of the male gender (p=0.0048). In opposition with our results, in anotehr study the presence of MS in RA patients was correlated with the activity disease and inflammation [16] and the prevalence was higher in patients with longer disease duration (42%) [17]. In other studies [11,18] the presence of MS was correlated with disease activity and older age, and had a prevalence similar with that we have obtained in our study, about 20% patients with PsA having a higher weight as compared with those with RA. That makes us believe that the adiposity may contribute to the cardiovascular morbidity in psoriatic arthritis in contrast to RA patients that have a BMI inversely correlated with cardiovascular mortality [19].

The limits of our study were: the small number of patiens included in the study and the lack of sex, age and duration of the disease adjustment. In order to obtain relevant data larger studies are required.

Conclusions

The metabolic syndrome prevalence in psoriatic arthritis is higher then in rheumatoid arthritis probably due to the presence of abdominal obesity, higher level of triglycerides and of fasting blood glucose. All the patients with psoriatic arthritis should be screened permanently for the appearance of the metabolic syndrome elements and cardiovascular risk factors, despite the duration and activity of the disease. They will need adequate treatment in case of the appearance of any abnormal component. Metabolic syndrome in psoriatic arthritis is not influenced by the age, disease duration and severity.

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