

OBESITY- AN IMPORTANT ASPECT IN THE MANAGEMENT OF RHEUMATOID ARTHRITIS

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ABSTRACT

OBESITY HAS BECOME A WORLDWIDE PUBLIC HEALTH PROBLEM, BEING RECOGNIZED BY WORLD HEALTH ORGANIZATION (WHO) IN 1995 AS A GLOBAL EPIDEMIC. IT'S IMPACT IS WIDELY RECOGNIZED DUE TO IT'S ASSOCIATION WITH METABOLIC AND/OR CARDIOVASCULAR DISORDERS.

RHEUMATOID ARTHRITIS (RA) IS AN INFLAMMATORY DISEASE CHARACTERIZED BY JOINT DESTRUCTION AND WHICH BY ITS AUTOIMMUNE CHARACTER PRESENTS ALSO A SYSTEMIC AFFECTION WITH A STRONG IMPACT ON QUALITY OF LIFE ⁸

MANY SPECIALTY LITERATURE DATA INDICATE THAT THE PREVALENCE OF OBESITY IS HIGHER IN PATIENTS DIAGNOSED WITH RHEUMATOID ARTHRITIS THAN IN GENERAL POPULATION. ALSO OBESITY HAS BEEN OBSERVED TO BE ASSOCIATED WITH GREATER SUBJECTIVE MEASURES OF DISEASE ACTIVITY AND POOR TREATMENT RESPONSE, BUT ALSO WITH A DECREASED RISK OF JOINT DAMAGE AND LOWER MORTALITY.⁹

KEY WORDS: OBESITY, RHEUMATOID ARTHRITIS, JOINT DAMAGE, ADIPOSITY

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⁹ Michael D. George1 and Joshua F. Baker1 "The Obesity Epidemic and Consequences for Rheumatoid Arthritis Care" Curr Rheumatol Rep. 2016 Jan; 18(1): 6.

INTRODUCTION

With the increasingly prevalence of obesity worldwide, specialty literature has began to study it's impact in various other disorders. It is widely known that obesity has been associated with metabolic and/or cardiovascular disorders but recent years, numerous specialty studies have been made to establish if there is any possible connection between patients with RA and obesity in order to better understand the physiopathology of RA and to be able to reach a better treatment response, altogether with a purpose of a better quality of life and nonetheless with a lower mortality in RA patients.

THE AIM OF THE STUDY

The aim of this study was to establish the prevalence of obesity among RA patients treated in the CF Clinical Hospital of Craiova and to compare it with the prevalence of obesity in general population. Also we wanted to establish the correlation between the control of the disease and the value of BMI.

MATERIAL AND METHHOD

This presented study is a observational, descriptive study that was conducted over a period of 1 year between August 2017 – September 2018. The conducted study included 74 patients previously diagnosed with RA undergoing Disease-modifying antirheumatic drugs (DMARDs) treatment and a control group of 74 patients without RA.

RA diagnosis was according to the 2010 American College of Rheumatology (ACR)/ European League Against Rheumatism (EULAR) classification criteria.

Obesity was assessed based on Body Mass Index (BMI) (weight divided by height squared) . According to WHO guidelines, individuals with a BMI of 30kg/m² or more are classified as obese¹⁰. A distinct category that must be mentioned is that of those with a BMI of 25-30 kg/m² that are characterized as overweight.

BMI CLASSIFICATION	
Class of weight	BMI (kg/m ²)
Underweight	<18.5
Normal range	18.5 – 24.9
Overweight	25 – 30
Obese class I	30 – 34
Obese class II	35 – 39
Obese class III (morbidly obese)	≥ 40

Table 1. BMI classification according to WHO

For all the patients included in this study, demographic data were collected and blood samples were taken from which erythrocyte sedimentation rate (ESR), rheumatoid factor (RF), C-reactive protein (CRP), and anti cyclic citrullinated peptide (anti-CCP) were tested.

¹⁰ World Health Organisation Obesity: preventing and managing the global epidemic. Report of a WHO Consultation, World Health Organ Tech Rep Ser , 2000, vol. 894:i–xii (pg. 1-253)

Further, we correlated the control of the disease by using both DAS28(CRP) and DAS28(ESR) with the value of BMI.

This study was conducted in accordance to the Declaration of Helsinki and local regulations. Ethical approval for the study was obtained from the Local Ethics Committee and also, patients in both groups signed an informed consent.

RESULTS AND DISCUSSIONS

The conducted study show no statistically significant differences regarding the patients ages in both groups. The 74 patients diagnosed with RA included in the study were aged between 34-73 years old with the highest incidence in the 40-50 y.o. group (25 patients – 33.78% from the total number of RA patients) and the lowest incidence in the 30-40 y.o group (7 patients – 9.45% from the total number of patients diagnosed with RA) ; as for the control group, patients were aged between 39-76 years old, with the highest incidence also in the 40-50 y.o. group (23 patients – 31.08% from the total number of patients in the control group) and the lowest incidence in the 30-40 y.o. group(3 patients – 4.05% from the total number of patients in the control group. (Figure 1.)

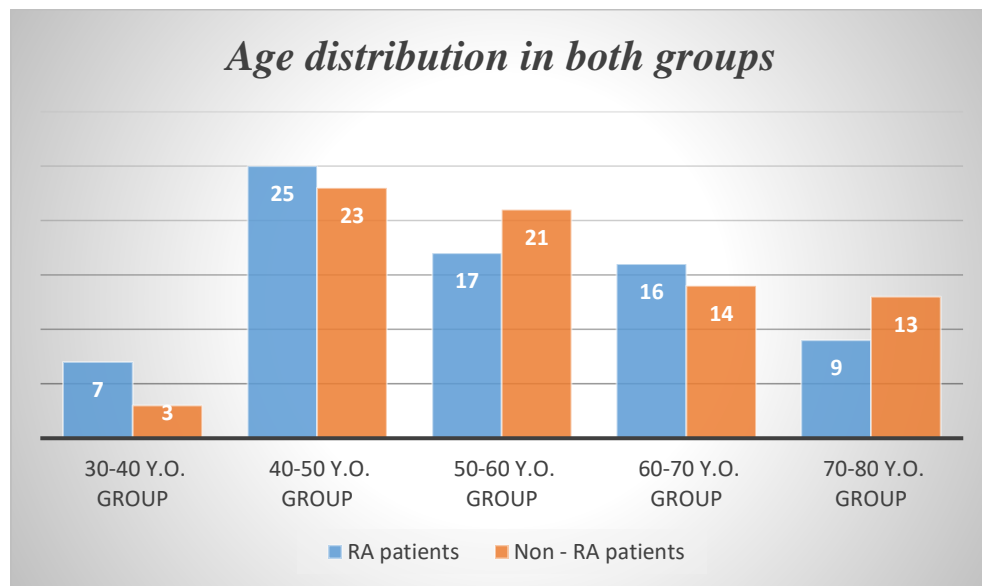


Figure 1. Age distribution in both groups.

Regarding gender distribution, this study show some important differences mainly due to the characteristics of rheumatoid arthritis. It is well known that RA is more prevalent in women with a approximate gender ratio women to men of 3:1. Thus, in the group of patients with RA, 65 (87.83%) were women and 9 (12.16%) were men. As for the control group, 45 patients (60.81%) were women and 29 (39.18%) were men. (Figure 2)

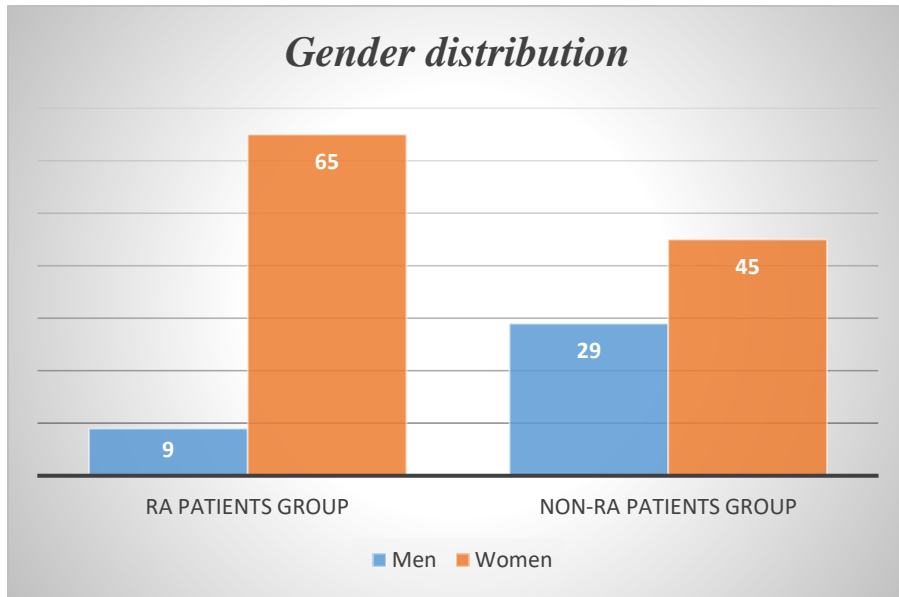


Figure 2. Gender distribution

When we analyzed the residence area distribution, we found that the patients were predominantly from urban areas in both groups. This can be explained by the increased accessibility of patients from urban areas to services medical, but also by a better medical education, which leads them to present themselves to a medical service when the symptoms appear. Thus, 50 patients with RA (67.56%) , and from the control group 56 (75.67%) patients were from urban areas. (Figure 3)

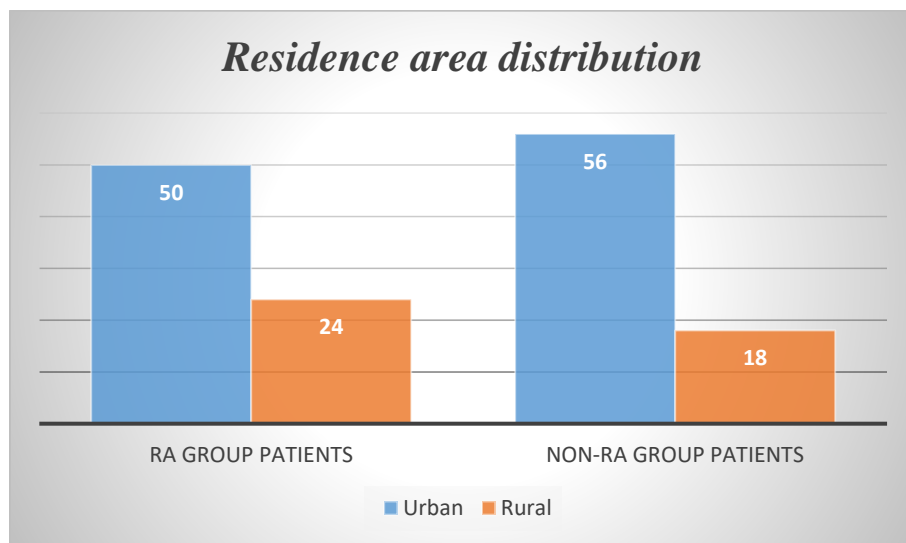


Figure 3. Patients distribution according to residence area

The assessment of obesity was made by calculating the BMI for each patient. The data collected within this study showed a higher prevalence of obesity within the group of patients diagnosed with RA than for the non-RA patients group. Thus, 14 patients with RA (18.91%) had a BMI $>30\text{kg/m}^2$, while in the non-RA patients group, only 8 patients (10.81%) were classified as obese. (Figure 4)

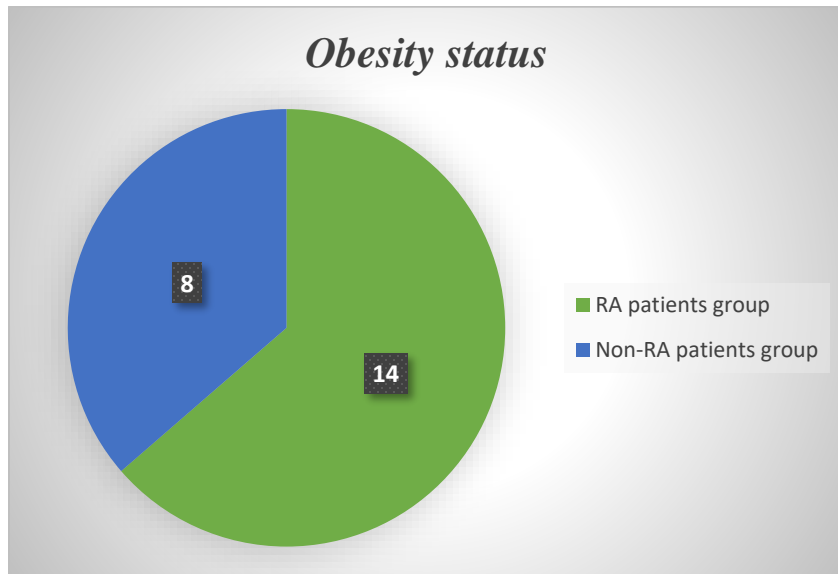


Figure 5. Obesity status in both group

In addition, we need to take into consideration that there were patients in both group with a BMI between 25kg/m^2 and 30kg/m^2 , which are characterized as overweight (Figure 6).

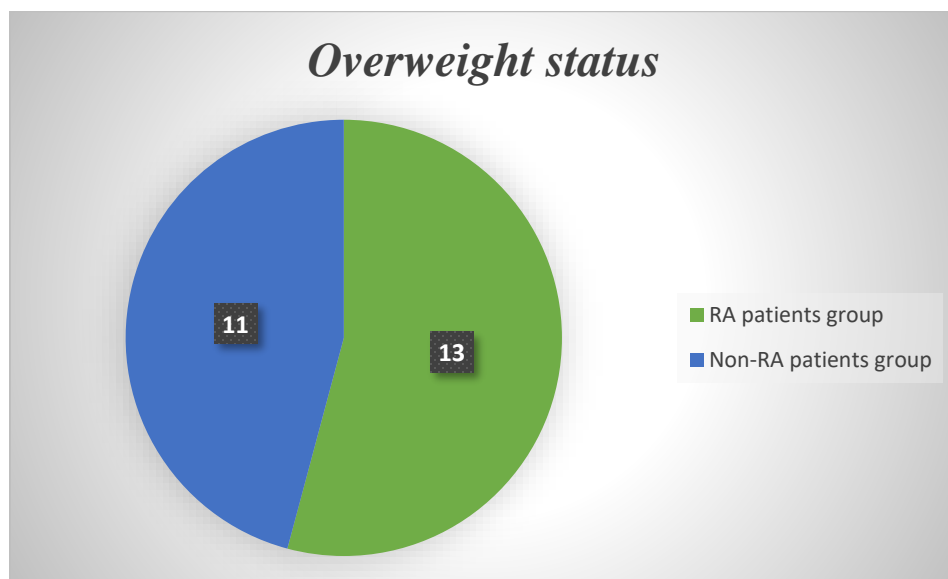


Figure 6. Overweight status in both groups

Further in our study, we focused on the patients diagnosed with RA. We calculated DAS28(ESR) and DAS28(CRP) scores for all the patient in order to assess the control of the disease and to correlate it with the value of BMI.

We observed higher values of DAS28(CRP) and DAS28(ESR) – meaning a poor control of the disease – in almost all of obese patients. (Table 2)

CRT. NO.	BMI value (kg/m ²)	DAS28 (ESR)	DAS28 (CRP)
1	26.34	4.09	4.51
2	19.00	3.15	3.59
3	19.06	4.95	4.98
4	26.57	4.65	5.47
5	19.58	3.13	3.05
6	28.97	4.71	4.98
7	27.75	4.03	5.07
8	21.04	3.67	3.21
9	20.35	3.41	3.06
10	31.5	5.03	4.87
11	25.7	4.62	4.12
12	27.34	3.4	3.98
13	21.74	4.3	3.67
14	21.59	4.87	4.01
15	24.31	2.56	3.56
16	23.19	3.14	3.98
17	36.4	3.79	4.67
18	31.2	4.18	5.08
19	30.7	4.09	3.16
20	26.89	3.20	2.98
21	28.37	4.57	4.24
22	23.47	4.14	5.78
23	24.14	4.56	3.98
24	31.09	3.09	4.27
25	22.24	4.35	4.03
26	20.19	3.87	4.35
27	18.57	3.05	3.05
28	18.98	2.89	3.56
29	26.25	3.75	3.9
30	20.36	4.89	4.21
31	32.84	4.43	5.73
32	21.25	3.89	3.01
33	24.15	4.57	3.37
34	27.15	3.98	4.98
35	22.52	4.26	3.76
36	23.63	3.06	3.57

37	31.4		4.37	3.98
38	23.58		2.76	3.09
39	29.3		4.79	4.05
40	20.81		4.22	3.07
41	19.51		4.25	5.73
42	22.45		3.53	4.98
43	21.09		3.09	2.78
44	30.1			3.09
45	20.05		3.25	3.45
46	19.14		5.45	4.03
47	31.6		4.02	4.51
48	29.35		3.24	3.08
49	21.25		4.68	3.66
50	22.58		5.36	4.36
51	21.53		4.09	4.14
52	30.27		4.01	4.58
53	19.51		3.57	3.08
54	18.74		3.01	3.63
55	20.3		4.34	5.89
56	19.45		4.57	5.26
57	33.01		3.57	4.09
58	23.6		3.84	3.12
59	19.39		4.04	3.27
60	23.41		3.89	4.75
61	31.46		3.24	3.85
62	22.04		4.78	4.09
63	20.18		3.01	3.22
64	26.74		2.98	4.09
65	19.46		4.36	4.02
66	18.01		3.64	3.07
67	17.09		4.46	4.16
68	24.01		4.76	5.39
69	24.16		3.56	2..16
70	32.01		4.66	5.44
71	19.26		4.13	5.89
72	21.54		4.19	4.32
73	30.59		3.16	3.58
74	21.29		4.19	5.12

Table 2. DAS28(ESR) and DAS28(CRP) correlated with BMI value

It is important to discuss about obesity in the context of rheumatoid arthritis merely when it comes about the treatment of RA because nowadays obesity is a pro-inflammatory state; Nevertheless it is widely known that adipose tissue is not a storage depot but more an active “organ”- an endocrine/paracrine organ- that secretes a number of bioactive molecules called

adipokines¹¹ which can be synthesized at other sites and participate in functions unrelated to the adipose tissue¹², mostly in the regulation of inflammation.

The importance of BMI lies in its association with cardiovascular risk and overall mortality: overweight individuals have a 20-40%, while obese a 2- to 3 – fold increased mortality rate compared with normal-weight individuals.

CONCLUSIONS

In the group of patients diagnosed with rheumatoid arthritis, there was a higher prevalence of obese patients. This can be explained because of the characteristics of RA that the patient experiences : swollen and tender joints, fatigue, disability, depression - , characteristics that can push the patient towards a more sedentary lifestyle with unhealthy eating.

The disease activity scores had high values – meaning a poor control of the disease – in patients with obesity, demonstrating once again that pro-inflammatory states like obesity must be taken in consideration in the management of rheumatoid arthritis.

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¹¹ Mohamed-Ali V, Pinkney JH, Coppack SW. Adipose tissue as an endocrine and paracrine organ, *Int J Obes Relat Metab Disord* , 1998, vol. 22 (pg. 1145-58

¹² Fantuzzi G. Adipose tissue, adipokines, and inflammation, *J Allergy Clin Immunol* , 2005, vol. 115 (pg. 911-9; quiz 920

REFERENCES

1. **ENE C.G., ROSU A., GHEORMAN V., CALBOREAN V., TENEA COJAN T.S., ROGOVEANU O. C., VLADU M. I., RADU L.** “Incidence of Osteoporosis and the Risk of Fracture in Patients with Rheumatoid Arthritis Undergoing Corticosteroid Treatment”, *Rev. Chim. (Bucharest)*, 69, No.7, 2018, p1851-1854
2. **Michael D. George¹ and Joshua F. Baker¹** “The Obesity Epidemic and Consequences for Rheumatoid Arthritis Care” *Curr Rheumatol Rep.* 2016 Jan; **18(1): 6.**
3. World Health Organisation Obesity: preventing and managing the global epidemic. Report of a WHO Consultation, World Health Organ Tech Rep Ser , 2000, vol. 894:i–xii (pg. 1-253)
4. **Mohamed-Ali V, Pinkney JH, Coppack SW.** Adipose tissue as an endocrine and paracrine organ, *Int J Obes Relat Metab Disord* , 1998, vol. 22 (pg. 1145-58)
5. **Fantuzzi G.** Adipose tissue, adipokines, and inflammation, *J Allergy Clin Immunol* , 2005, vol. 115 (pg. 911-9; quiz 920)