Assessment of the incidence and prevalence of rheumatoid arthritis in the District of Elbasan for the period 2011-2021

MD Armida HIDA
European University of Tirana
Corresponding author
E-mail: armida.hida@uet.edu.al

Abstract

Introduction: *Rheumatoid arthritis (RA) is an autoimmune and chronic disease. Worldwide, the annual incidence of RA is 1%. Epidemiological data for Albania are similar to other countries, still some districts might be more affected. There are no previous studies in the population indicating the prevalence or incidence of rheumatoid arthritis in the Elbasan district.*

Objective: *This study aims to estimate the incidence and prevalence of rheumatoid arthritis in Elbasan district during a decade (2011-2021) according to gender, place of residence and age group and to evaluate the trend of ambulatory visits for RA.*

Methodology: *The population in this retrospective study are all patients hospitalized at the Elbasan Regional Hospital with the diagnosis of rheumatoid arthritis during the period January 2011 - December 2021. The study also evaluated the correlation of different genetic, lifestyle and environmental factors in patients with rheumatoid arthritis in this district.*

Results: *During 2011 - 2021, a total of 2554 cases diagnosed with rheumatoid arthritis were identified, out of them 877 (34.3%) cases were new or incident cases and 1677 (65.7%) chronic or existing cases or prevalent cases. Incident cases ranged from 30.2/100,000 to 58.3/100,000 while prevalent cases ranged from 29.7/100,000 to*

201.9/100,000 inhabitants. The incidence of AR according to years in women ranges from 2 to 4 times higher compared to men (p<0.01). The highest incidence is in the age group of 45-54 years, 149.3/10000 and in the age group of 55-64 years, 148/10000, with a significant difference with the other age groups. In addition, the incidence in the rural area is higher than in the urban area, with a significant difference between them.

Conclusions: *This study provides a broad overview of the incidence and prevalence of RA in the district of Elbasan over a relatively long-time span.*

Key words: *Rheumatoid arthritis (RA), Incidence, Prevalence, Elbasan*

Introduction

Rheumatoid arthritis (RA) is an autoimmune, chronic, multisystemic, multifactorial inflammatory disease[1]. Although there are a large number of systemic symptoms, the main characteristic of established rheumatoid arthritis is persistent inflammatory synovitis that usually affects peripheral joints symmetrically[2]. But any joint that has a synovial membrane can be affected by inflammation. In this disease, synovial inflammation has the ability to cause cartilage damage and bone erosions with consequences up to ankylosis and disability[3]. The joints that are most often affected in RA are the metacarpophalangeal, radiocarpal, proximal interphalangeal, knee, and to a lesser extent other joints. The course of RA despite the presence of this synovial inflammation may be different[4]. Some patients may have moderate oligoarticular involvement for a short time with minor joint damage, but most have progressive polyarthritis with significant functional impairment[5]. The purpose of the study is to evaluate the epidemiology of rheumatoid arthritis in the district of Elbasan during the period 2011-2021.

Methods

In this retrospective study to assess the incidence and prevalence of RA in the district of Elbasan, the population included in the study is: All patients hospitalized at the Elbasan Regional Hospital with the diagnosis of rheumatoid arthritis during the period January 2011 - December 2021. The data were obtained in the statistics department of Elbasan Regional Hospital. Patients who were hospitalized from other districts of Elbasan district such as Librazhi, Peqini and Gramshi were excluded from the statistics.

The following data were extracted from the cards:

- Demographic and socio-economic characteristics: age, gender, education level (8 years, secondary, high), employment status (employed, unemployed and retired), economic level (low, secondary, high).
- Lifestyle factors: smoking, alcohol consumption, excessive meat consumption, excessive fat consumption.
- Concomitant conditions: obesity, other comorbidities, arterial hypertension, history of angina pectoris, myocardial infarction or heart disease, diabetes.
- Body mass index (BMI). Calculated according to the formula kg/m2.
- Data for outpatients: In the polyclinic and health centers, the number of visits for AR over the years was extracted. It is worth noting that the statistics were not very correct because we judge that not in all cases the correct diagnosis was RA, but nevertheless the epidemiological situation is evaluated taking this limitation into account.

Data analysis: The statistical program SPSS 25.0 was used for data analysis. Continuous variables are summarized as the mean ± standard deviation (SD). The percentage of patients in each category was calculated for categorical variables. The $\chi 2$ test was used to compare percentages between categorical variables. The student's t test was used to compare continuous means. The incidence and prevalence of PR are calculated based on the average population of the period 2011-2021 in total and according to gender, residence, and age group. The p value ≤ 0.05 was considered statistically significant. All statistical tests are two-sided.

Results

In total, during the period January 2011 - December 2021, 2554 cases diagnosed with rheumatoid arthritis were identified, out of them 877 (34.3%) cases were new or incident cases and 1677 (65.7%) were chronic or existing cases or prevalent cases. Total AR cases ranged from 114 to 491 with a significant upward trend during the study period ($p<0.01$). In 2020 and 2021, a decrease in hospitalized cases is observed due to the restrictions during the pandemic.

The number of new and prevalent cases by years

Incident cases ranged from 30.2/100,000 to 58.3/100,000 while prevalent cases ranged from 29.7/100,000 to 201.9/100,000 inhabitants.

TABLE 1. Incidence and prevalence of RA in the district of Elbasan

Year	New cases (incidence)	Population of the district	Incidence /100000	Existing cases (prevalence)	Population of the district	Prevalence /100000
2011	65	188662	34.5	75	188662	39.8
2012	57	188662	30.2	92	188662	48.8
2013	73	188662	38.7	134	188662	71.0
2014	71	188662	37.6	96	188662	50.9
2015	58	188662	30.7	56	188662	29.7
2016	74	188662	39.2	110	188662	58.3
2017	82	188662	43.5	149	188662	79.0
2018	86	188662	45.6	254	188662	134.6
2019	110	188662	58.3	381	188662	201.9
2020	99	188662	52.5	169	188662	89.6
2021	102	188662	54.1	161	188662	85.3

The incidence of RA presents a significant increasing trend even during two years of the pandemic.

TABLE 2. Incidence according to years in men and women

Year	New cases MALE	Population: Males	Incidence /100000	New cases FEMALE	Population: Female	Incidence /100000
2011	19	95016	20.0	46	93647	49.1
2012	17	95016	17.9	40	93647	42.7
2013	20	95016	21.0	53	93647	56.6
2014	22	95016	23.2	49	93647	52.3
2015	15	95016	15.8	43	93647	45.9
2016	23	95016	24.2	51	93647	54.5
2017	20	95016	21.0	62	93647	66.2
2018	20	95016	21.0	66	93647	70.5
2019	20	95016	21.0	90	93647	96.1
2020	23	95016	24.2	76	93647	81.2
2021	20	95016	21.0	82	93647	87.6

A significant change in the incidence trend of RA was found between women and men. The incidence of RA according to years in women varies from 2 to 4 times higher compared to men ($p<0.01$).

TABLE 3. Incidence according to years in urban and rural areas

Year	New cases urban area	Population: urban area	Incidence /100000	New cases Rural area	Population : rural area	Incidence /100000
2011	29	93492	31.3	36	95170	37.6
2012	25	93492	27.0	32	95170	33.4
2013	33	93492	35.5	40	95170	41.9
2014	32	93492	33.7	39	95170	41.5
2015	31	93492	33.0	27	95170	28.6
2016	41	93492	43.3	33	95170	35.2
2017	37	93492	39.7	45	95170	47.1
2018	38	93492	40.1	48	95170	50.9
2019	47	93492	50.3	63	95170	66.2
2020	46	93492	49.1	53	95170	55.8
2021	48	93492	51.5	54	95170	56.5

In addition, the incidence in the rural area is higher than in the urban area, with a significant difference between them.

TABLE 4. The incidence of cases according to age groups

Age group, in years	New cases	Population	Incidence /10000
0-1	0	3328	0.0
1-4	1	7433	1.3
5-14	3	23439	1.3
15-24	16	31173	5.1
25-34	19	27425	6.9
35-44	82	21856	37.5
45-54	376	25192	149.3
55-64	353	23853	148.0
>65	27	24963	10.8

The highest incidence is in the age group of 45-54 years, 149.3/10000 and in the age group of 55-64 years, 148/10000, with a significant difference with the other age groups.

TABLE 5. The number of ambulatory visits for RA during the period 2011-2021

Year	Number of visits	%
2011	8251	8.7
2012	8322	8.7
2013	8417	8.8
2014	8831	9.3
2015	8113	8.5
2016	8589	9.0
2017	9472	9.9
2018	10469	11.0
2019	11074	11.6
2020	5665	5.9
2021	8134	8.5
Total	95337	100.0

The number of outpatient visits shows an increasing trend over the years, with a decrease only in the two years of the pandemic.

TABLE 6. Sociodemographic characteristics of patients

Variables	Number	%	P
Gender			
Female	658	75.0	<0.01
male	219	25.0	
Age , M (SD)	52.4 (7.5)	[4-83]	
Age group, years			
<25	20	2.3	
25-34	19	2.2	
35-44	82	9.4	<0.01
45-54	376	42.9	
55-64	353	40.3	
>65	27	3.1	
Civil status			
Single	26	3.0	
Married	776	88.5	<0.01
Divorced	37	4.2	
Widow	38	4.3	

Education			
School	278	31.7	<0.01
High school	431	49.1	
University	168	19.2	
Occupation			
Unemployed	111	12.7	
Retiree	381	43.4	0.01
Self employed	143	16.3	
Employed	242	27.6	
Income			
Low Income	404	46.1	<0.01
Average Income	382	43.6	
High Income	91	10.3	
Residence			
Urban	407	46.4	0.03
Rural	470	53.6	

887 patients with RA with a mean age of 52.4 (7.5) years participated in the study, of which 658 (75%) were female and 219 (25%) male. The ratio of women/men is 3 : 1.

Patients in the age group of 45-54 years (42.9%) and patients in the age group of 55-64 years (40.3%) predominate with significant difference with the younger age groups ($p<0.01$). Married patients predominate (88.5%), followed by divorced and widowed with 4.2% each category and singles (3%), with a significant difference between them ($p<0.01$).

Patients with secondary education predominate (49.1%), followed by those with low education (31.7%) and 19.2% of patients have higher education, with a significant difference between them ($p<0.01$). Retired patients predominate (43.4%), followed by employed (27.6%), self-employed (16.3%) and unemployed (12.7%) patients ($p<0.01$). Patients with low income prevail (46.1%), followed by patients with average income (43.6%), while patients with high income are (10.3%), with a significant difference between them ($p<0.01$). Patients from rural areas predominate (53.6%) compared to patients living in urban areas (46.4%), with a significant difference between them ($p=0.03$).

TABLE 7. Distribution of genetic factors and lifestyle factors

Variables		Male (n=219)	Female (n=658)	P
Genetic factors	No	127 (58.0)	296 (45.0)	<0.01
	Yes	92 (42.0)	362 (55.0)	
Smoking	No	149 (68.0)	559 (85.0)	<0.01
	Yes	70 (32.0)	99 (15.0)	
Alcohol consumption	No	153 (69.9)	592 (90.0)	<0.01
	Yes	66 (30.1)	66 (10.0)	
High consumption of meat	No	131 (59.8)	526 (79.9)	<0.01
	Yes	87 (39.7)	132 (20.1)	
High fat consumption	No	164 (74.9)	507 (77.1)	0.5
	Yes	55 (25.1)	151 (22.9)	
Obesity	No	157 (71.7)	395 (60.0)	<0.01
	Yes	62 (28.3)	263 (40.0)	
Arterial hypertension	No	153 (69.9)	447 (67.9)	0.6
	Yes	66 (30.1)	211 (32.1)	
Diabetes	No	186 (84.9)	554 (84.2)	0.8
	Yes	33 (15.1)	104 (15.8)	
Heart dissases	No	175 (79.9)	549 (83.4)	0.2
	Yes	44 (20.1)	109 (16.6)	

Genetic factors prevail among women (55%) compared to men (42%), (p<0.01). Also, smoking (32%) and alcohol (30.1%) predominate among men (p<0.01). Exaggerated meat consumption was much higher in males (39.7%) compared to females (20.1%) with a significant difference (p<0.01). No significant difference was found regarding fat intake between men (25.1%) and women (22.9%) (p=0.5). Overall obesity (BMI>30) was higher in women (40%) compared to men (28.3%), with a significant difference with men (28.3%) (p<0.01). No significant difference

was found between men and women in terms of the frequency of HTA (p=0.6), diabetes (p+0.8) and heart disease (p+0.2).

Discussion

Worldwide, the annual incidence of RA is approximately 3 cases per 10,000 population and the prevalence rate is approximately 1%, increasing with age and peaking between 35 and 50 years of age. In population-based studies in developed countries, it has been reported by most serious literature sources that the frequency of rheumatoid arthritis ranges from 0.5%-1.0% of the adult population[6] . International literature also reports that rheumatoid arthritis is a disease that affects women three times more than men[7] . In our study, in the contingent of users of primary health services, there was also evidence of a gender gradient, where the proportion of cases with rheumatoid arthritis in women was 2 to 4 times higher compared to men.

The literature data are comparable to this study regarding incidence, age of onset and gender. According to contemporary literature, the prevalence of rheumatoid arthritis is increasing among individuals in both sexes. In our study, we obtained an evidence similar to the reports of the world literature on this point and evidenced a greater proportion of elderly cases with rheumatoid arthritis in both genders[8] .

In fact, until now there are no data based on studies in the population on the prevalence or incidence of rheumatoid arthritis in the Elbasan district. From this point of view, the present study is a novelty for our country. This is because studies based directly on the population are very difficult to carry out and the fact is that data on the incidence or prevalence of rheumatoid arthritis are missing for most of the populations of the countries of our region. International literature, mainly that of industrialized or developed countries, estimates that the frequency of rheumatoid arthritis varies/changes according to the methods used to determine the presence of this disease. The prevalence of rheumatoid arthritis has significant geographic variation[9] .

This disease is more frequent in Northern European and North American countries compared to many developing and/or transitioning countries and regions, such as rural areas in West Africa[10] .It has been suggested that these geographic changes may be related to different genetic predispositions, but also to environmental factors that expose different individuals to different levels of risk for the development of rheumatoid arthritis in different areas and regions of the world[11] . The data of the study are similar to other studies also in terms of lifestyle factors[12] .

Regarding the other risk factors for the development of rheumatoid arthritis, smoking and excessive alcohol consumption were more frequent etiological factors in the contingent of male patients compared to females[13,14] , this fact is present in the literature as well.

Conclusion

The results of this study shed light on a new and very important evidence on the incidence and prevalence of RA in the district of Elbasan. This paper specifically provides a detailed overview of the incidence and distribution of RA in the rural and urban area of this district. It identifies some of the risk factors for the development of RA in this population. The study examines in detail the impact and specific role of lifestyle factors such as smoking, excessive alcohol consumption, meat and fat consumption in the etiology of RA. The influence and association of RA with other chronic diseases such as cardiovascular diseases (arterial hypertension, angina pectoris, myocardial infarction), diabetes, etc.

Recommendations

Although a large number of environmental and hormonal factors have been implicated in the etiology of rheumatoid arthritis, conflicting results are reported with most of them, making necessary the development of other more significant studies. However, smoking is confirmed as an important risk factor in the etiology of rheumatoid arthritis. Therefore, it is necessary to work in the fight against smoking with patients in medical clinics but also with the population as a whole, not only for the prevention of rheumatoid arthritis but, at the same time, for the prevention of a large number of other diseases caused by smoking (including cardiovascular disease and bronchial cancer).

The strategy in the fight against smoking would be very fruitful and effective, especially for individuals who have a genetic predisposition for the development of rheumatoid arthritis, and smoking in these subjects is an explosive factor of this disease. The current study emphasizes that understanding which environmental factor may influence the initial immune processes that drive the development of disease, chronicity, and co-morbidities (other diseases) that accompany rheumatoid arthritis is of fundamental importance for any effort to the prevention of rheumatoid arthritis and all the consequences of this disease. This paper proves and documents the fact that, currently, on a global scale, little progress has been made on the impact of environmental factors on the initial immune processes

that promote the development of rheumatoid arthritis, since there are very few resources in this field of Rheumatology, including the countries or societies most advanced Western.

Therefore, there is a natural need to invest in scientific research. Innovations and technologies related especially to prevention, but also to early diagnosis and cost-effective treatment of rheumatoid arthritis in the population.

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