Comorbid conditions and treatment of low bone mineral density and rheumatoid arthritis in Albanian women

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Abstract

Aim: Our aim was to describe the distribution of comorbid conditions and treatment type in women with rheumatologic conditions (low bone mineral density and/or rheumatoid arthritis) in Tirana, Albania.
Methods: This was a cross-sectional study which was conducted in the period 2012-2013 including a sample of 2198 consecutive women aged 30 years and over who attended the Rheumatology services at primary health care clinics in Tirana municipality (overall response rate: 95%). Low bone mineral density was defined as a bone mineral density T-score less than -1. The diagnosis of rheumatoid arthritis was based on clinical signs, laboratory tests and radiological examination. Information on comorbid conditions, type of treatment, as well as socio-demographic factors was also collected for all study participants. Logistic regression was used to assess the association of drug intake with rheumatologic conditions (low bone mineral density and/or rheumatoid arthritis).
Results: Overall, 136 (6.2%) women were treated with drugs against diabetes; 184 (8.4%) received drugs against hyperthyroidism; 57 (2.6%) received Levothyroxine; 27 (1.2%) had diuretics; 182 (8.3%) had vitamin D; 267 (12.1%) received calcium; 47 (2.1%) had drugs against osteoporosis; and 51 (2.3%) received cortisone. In multivariable-adjusted models (after controlling for all demographic and socioeconomic characteristics, as well as for the presence of comorbid conditions), there was evidence of a positive and statistically significant association between drug intake and rheumatologic conditions (OR=1.87, 95%CI=1.21-2.74).
Conclusion: This is one of the few reports informing about the distribution of drug intake and comorbid conditions among women with rheumatologic conditions (low bone mineral density and/or rheumatoid arthritis) in Albania. Findings of this study may help health professionals and policymakers involved in the control and prevention of rheumatologic conditions in Albania.

Keywords: bone mineral density, comorbidity, drug intake, rheumatoid arthritis, Rheumatology, treatment.

Introduction

Low bone mineral density and rheumatoid arthritis constitute two major conditions in the Rheumatology practice. Low bone mineral density increases considerably the risk of fractures (1) and consists of two progressive stages referred to as osteopenia and osteoporosis (1,2).These two progressive stages of low bone mineral density (namely osteopenia and osteoporosis) are more common among women, particularly after the onset of menopause (7). Risk factors for low bone mineral density include several lifestyle factors such as smoking, excessive alcohol consumption and sedentary behavior (1,4). Conversely, rheumatoid arthritis is regarded as a systemic autoimmune disease which is characterized by inflammation and joint destruction (5). Similar to low bone mineral density, rheumatoid arthritis has a significantly higher frequency in women than in men (5).

As reported previously, the burden of musculoskeletal disorders has increased in Albania during the transition process (6). Thus, the proportion of musculoskeletal disorders constituted only 8.5% of the total burden of disease in Albanian in 1990, whereas in 2010 it increased up to 11.0% (7). This increase was steeper in females than in males (3.7% vs. 2.0%, respectively (6,7). Yet, information on the distribution of comorbid conditions and treatment type among Albanian individuals with low bone mineral density and rheumatoid arthritis is scant. In this context, we aimed to describe the distribution of comorbid conditions and treatment type in women with rheumatologic conditions (low bone mineral density and/or rheumatoid arthritis) in Tirana, Albania, a former communist country in South Eastern Europe which has undergone a significant political and socioeconomic transformation in the past decades (7).

Methods

This was a cross-sectional study which was carried out in Tirana city during the period 2012-2013. In this study there were included 2198 consecutive women aged 30 years and over who attended the Rheumatology services at primary health care clinics in Tirana municipality. Based on initial sample size calculations, the required number was estimated at 1870 women in order to obtain an adequate number of cases with the two main rheumatologic conditions under investigation (namely low bone mineral density and rheumatoid arthritis). However, we decided to include 2500 consecutive women aged $\geq$30 years who attended the Rheumatology services in order to increase the study power and also considering the potential non-response. Of 2500 women targeted for inclusion, 198 women were ineligible (too sick to participate), whereas 104 further women refused to participate. Hence, the final study sample included 2198 eligible women who agreed to participate (overall response rate: 2198/2302=95%).

Bone mineral density was measured in all female participants with a bone ultrasound device which is simple and easy to use for screening of bone mineral density in such studies (8,9). Based on the respective values, low bone mineral density was defined as a bone mineral density T-score less than -1 (that is osteopenia and/or osteoporosis).

Conversely, the diagnosis of rheumatoid arthritis was based on clinical signs and symptoms (presence of pain and morning stiffness), laboratory tests (rheumatoid factor and other antibodies), as well as the radiological examination.

Information on the presence of other comorbid conditions (Paget's disease, chronic liver disease, primary hyperparathyroidism, Cushing syndrome and chronic kidney failure) was also obtained for all study participants.

Also, data on drug intake (drugs against diabetes, drugs against hyperthyroidism in general, use of Levothyroxine, diuretics, vitamin D, calcium, drugs against osteoporosis, use of Bonviva, Osteofos, cortisone, as well as chemotherapy or radiotherapy) was collected for all women included in this study. In addition, a structured questionnaire was employed in order to assess demographic and socioeconomic characteristics of study participants

[age (which was dichotomized in the analysis into: ≤50 years vs. >50 years), marital status (dichotomized into: married vs. not married), employment status (employed and/or retired vs. unemployed), educational attainment (trichotomized into: low, middle and high)].

Binary logistic regression was used to assess the association of drug intake with rheumatologic diseases (low bone mineral density and/or rheumatoid arthritis). In the beginning, crude (unadjusted) odds ratios (ORs) and their respective 95% confidence intervals (95%CIs) were calculated. After that, age-adjusted models were run. Subsequently, other demographic characteristics and socioeconomic factors (marital status, employment status and educational level) were also introduced into the logistic regression models. At last, presence of comorbid conditions (Paget's disease, chronic liver disease, primary hyperparathyroidism, Cushing syndrome and chronic kidney failure) were also introduced into the models. Multivariable-adjusted ORs and their respective 95%CIs were calculated. A p-value ≤0.05 was considered as statistically significant in all cases. Statistical package for Social Sciences (SPSS, version 15.0) was employed for all the statistical analyses.

Results

Mean age of study participants was 60.2±9.7 years; median age was 60.0 years (interquartile range: 54.0-67.0 years). On the other hand, the age range was 30-92 years.

Table 1 presents the distribution of drug treatment in this female sample of primary health care users seeking care at Rheumatology services in Tirana municipality. Overall, there were 136 (6.2%) women who were treated with drugs against diabetes. Drugs against hyperthyroidism were reported by 184 (8.4%) of the women. Use of Levothyroxine (thyroid hormone) was reported by 57 (2.6%) of the women included in this study. Diuretics were used by 27 (1.2%) of the women. The prevalence of vitamin D usage was 8.3% (N=182), whereas the prevalence of calcium use was 12.1% (N=267). On the whole, drugs against osteoporosis were reported by 47 (2.1%) of the women. However, use of Bonviva (a special drug against osteoporosis) was reported by one woman only. Instead, Fosamax was used by 5 (0.5%) of women, whereas Osteofos was used by 10 (0.5%) of them. The prevalence of cortisone use was 2.3% (N=51). Overall, 13 (0.6%) of the women had undergone chemotherapy, whereas 20% (0.9%) of them had undergone radiotherapy (Table 1).

Table 1. Drug treatment in a sample of female users of Rheumatology services at primary health care level in Tirana, Albania, during 2012-2013

Drug type	Number	Percentage
Drugs against diabetes:		
Yes	136	6.2
No	2062	93.8
Total	*2198*	*100.0*
Drugs against hyperthyroidism:		
Yes	184	8.4
No	2014	91.6
Levothyroxine:		
Yes	57	2.6
No	2141	97.4
Diuretics:		
Yes	27	1.2
No	2171	98.8

Drug type	Number	Percentage
Vitamin D:		
Yes	182	8.3
No	2016	91.7
Calcium:		
Yes	267	12.1
No	1931	87.9
Drugs against osteoporosis:		
Yes	47	2.1
No	2151	97.9
Bonviva:		
Yes	1	0.05
No	2197	99.95
Fosamax:		
Yes	10	0.5
No	2188	99.5
Osteofos:		
Yes	10	0.5
No	2188	99.5
Cortisone:		
Yes	51	2.3
No	2147	97.7
Chemotherapy:		
Yes	13	0.6
No	2185	99.4
Radiotherapy:		
Yes	20	0.9
No	2178	99.1

Table 2 presents the distribution of comorbid conditions in the sample of women included in this study. Paget's disease was present in one woman only. Chronic liver disease was present in 16 (0.7%) of the women. Primary hyperparathyroidism and Cushing syndrome were each present in 3 (0.1%) women. On the other hand, chronic kidney failure was present in 22 (1.0%) of the women included in this study.

Table 3 presents the association of drug intake with rheumatologic conditions (low bone mineral density and/or rheumatoid arthritis). In crude (unadjusted) models (model 1), drug intake was strongly and positively related to rheumatologic conditions (OR=3.28, 95%CI=2.19-4.12, P<0.001). In age-adjusted models (model 2), the association was attenuated (OR=2.61, 95%CI=1.91-3.14, P<0.001). Additional adjustment for the other socio-demographic characteristics (marital status, employment status and educational level–model 3) attenuated only slightly the strength of the association (OR=2.43, 95%CI =1.84-2.93, P=0.001). In multivariable-adjusted models (after controlling for all demographic and socioeconomic characteristics, as well as for the presence of other diseases/conditions), there was still evidence of a positive and statistically significant association between drug intake and rheumatologic conditions (OR=1.87, 95%CI=1.21-2.74, P=0.002) (Table 3 – model 4).

Table 2. Comorbidity among women seeking care at Rheumatology services of primary health care centers in Tirana during 2012-2013

Disease/condition	Number	Percentage
Paget's disease:		
Yes	1	0.05
No	2197	99.95
Total	*2198*	*100.0*
Chronic liver disease:		
Yes	16	0.7
No	2182	99.3
Primary hyperparathyroidism:		
Yes	3	0.1
No	2195	99.9
Cushing syndrome:		
Yes	3	0.1
No	2195	99.9
Chronic kidney failure:		
Yes	22	1.0
No	2176	99.9

Table 3. Association of drug intake with rheumatologic conditions (low bone mineral density and/or rheumatoid arthritis) – odds ratios from binary logistic regression

Model	OR	95%CI	P
Model 1*:			
No arthritis	1.00	reference	<0.001
Arthritis	3.28	2.19-4.12	
Model 2†:			
No arthritis	1.00	reference	<0.001
Arthritis	2.61	1.91-3.14	
Model 3‡:			
No arthritis	1.00	reference	0.001
Arthritis	2.43	1.84-2.93	
Model 4¶:			
No arthritis	1.00	reference	0.002
Arthritis	1.87	1.21-2.74	

*Model 1: crude odds ratios (OR: drug intake vs. no intake), 95% confidence intervals (95%CIs) and p-values from binary logistic regression.
Model 2: adjusted for age.
Model 3: adjusted also for the other demographic and socioeconomic characteristics (marital status, employment status and educational level).
¶Model 4: adjusted additionally for the presence of other diseases/conditions (at least one vs. none).

Discussion

This study provides evidence on the distribution of drug intake and comorbid conditions among Tirana women with rheumatologic conditions (low bone mineral density and/or rheumatoid arthritis) attending primary health services. In this study, there was a strong association between drug intake and these two rheumatologic conditions. The relationship was attenuated upon adjustment for socio-demographic characteristics and the presence of comorbid conditions, but it nevertheless remained statistically significant. Given the fact that

our study sample comprised primary health care users of Rheumatology services, the prevalence of both low bone mineral density and especially rheumatoid arthritis were high significantly higher than the estimates in the general population.

Low bone mineral density and rheumatoid arthritis are two major conditions in Rheumatology practice. Rheumatoid arthritis is a systemic autoimmune disease which leads to synovial hypertrophy and adjacent bone and cartilage destruction causing substantial morbidity and mortality (5). In turn, low bone mineral density increases significantly the risk of fractures (1). Women who experience both of these conditions that is low bone mineral density and rheumatoid arthritis are subject to a significant reduction of the quality of life and experience substantial physical and functional limitations (10,11). These facts should be taken into consideration by general practitioners and particularly rheumatologists in Tirana involved with the control and treatment of chronic patients with these rheumatologic conditions.

In any case, this study may have some limitations which include the sample involved, the possibility of information bias, as well as the study design. Regarding the sample included in this study, we should point out that it may not be representative of the overall women with rheumatologic conditions (low bone mineral density and/or rheumatoid arthritis) in Albania because this study was restricted to Tirana municipality. However, for this district which is the largest in Albania, there is no evidence of a possible selection bias of the sample included in this study because we included all consecutive women who were eligible for participation. By doing so (i.e., selecting consecutive women), we increased the representativeness of the study sample. Yet, findings of this study may be generalized only to female primary health care users who seek care at the Rheumatology services in Tirana city. As for the information bias, we employed a robust assessment of rheumatologic conditions (low bone mineral density and rheumatoid arthritis) in this study. From this point of view, measurement of bone mineral density and diagnosis of rheumatoid arthritis were based on internationally valid instruments which have been widely used in similar studies. Nonetheless, the self-reported data on demographic and socioeconomic characteristics, lifestyle/behavioral factors and drug use may have been subject to information bias. On the face of it though, there is no evidence of differential reporting by women of different backgrounds included in this study. Finally, this was a cross-sectional study and, as such, the associations observed should be treated with caution.

In conclusion, bearing in mind these potential limitations, this is one of the few reports informing about the distribution of drug intake and comorbid conditions among women with rheumatologic conditions (low bone mineral density and/or rheumatoid arthritis) residing in Tirana, the capital city of Albania. Findings of this study will help health professionals involved in the control and prevention of rheumatologic conditions in Albania. In addition, these findings may support evidence-based decision making and rationale policy formulation in Albania in order to control the pace of rheumatologic conditions in a country with limited financial resources. Nevertheless, there is a need for further nationwide studies in Albania in order to provide national estimates of the magnitude and distribution of rheumatologic diseases in the general adult population of this transitional society.

Conflicts of interest: None declared.

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