ORIGINAL RESEARCH

Urban-rural differences in Spanish menopausal women

JA Martinez[1], S Palacios[2], F Chavida[3], M Pérez[4]

[1]*Primary Health Centre Guadalajara-Sur, Guadalajara, Spain*
[2]*Palacios Institute of Women's Health and Medicine, Madrid, Spain*
[3]*Primary Health Centre Cervantes, Guadalajara, Spain*
[4]*Almirall Pharmaceuticals, Medical Department, Barcelona, Spain*

A B S T R A C T

Introduction: Most women spend one-third to half of their lifespan in the postmenopausal phase. As menopause involves biological and psychosocial changes that may significantly impair quality of life, the objectives of this study were to: (1) evaluate the prevalence of risk factors for osteoporosis and cardiovascular disease and the prevalence and severity of the appearance of menopausal symptoms among rural and urban Spanish menopausal women; (2) identify the main factors responsible for severity of symptoms; and (3) detect symptom differences between rural and urban women.

Methods: This cross-sectional descriptive study included 10 514 random-sampled women aged 45-65 years from Spain. Sociodemographic information, medical history and lifestyle data were assessed by survey. The Kupperman scale was used to assess severity of menopausal symptoms.

Results: Urban women had a higher prevalence of cardiovascular and osteoporosis risk factors than rural women, although this was not statistically significant. There was a greater frequency of menopausal symptoms in urban women although rural women experienced more hot flushes ($p<0.05$), depression, joint pain and tingling. In rural women menopausal symptoms were less severe ($p<0.01$).

Conclusions: A high prevalence of risk factors for osteoporosis, and cardiovascular disease in particular, was observed. There were statistically significant differences between urban and rural women for some cardiovascular risk factors, frequency of hot flushes and severity of menopausal symptoms.

Key words: cardiovascular disease, menopause, osteoporosis, risk factors, Spain, urban-rural differences, women's health.

Introduction

Menopause is caused by the depletion of ovarian function in women, followed by the cessation of menstruation. Most women spend one-third to half of their lifetime in postmenopause. The increasing length of postmenopausal life emphasises the importance of the effects of menopause[1], which include biological and psychosocial changes.

Menopause may be associated with vasomotor symptoms, bone loss, urogenital atrophy, urinary tract infections and incontinence, increased cardiovascular risk, somatic symptoms, sexual dysfunction and decreased libido. These symptoms may lead to social impairment and work related difficulties that significantly decrease overall quality of life.

Cross-cultural research on menopause suggests that the symptoms of and attitudes to menopause vary considerably according to environment, health status and cultural paradigms around women's health[2]. Thus, evaluating these aspects may be helpful in gauging the effects of menopausal symptoms. Demographic characteristics, and psychosocial and lifestyle factors are important determinants of postmenopausal symptoms.

This observational study was designed to: (i) evaluate the prevalence of risk factors for osteoporosis and cardiovascular disease and the prevalence and severity of the appearance of menopausal symptoms among rural and urban Spanish menopausal women; (ii) identify the main factors responsible for severity of symptoms; and (iii) detect symptom differences between rural and urban women.

Methods

Subject design and sampling

The FASEM is a Spanish scientific forum that studies menopausal women. The FASEM study is a 2006 cross-sectional study that was conducted throughout Spain on women aged 45-65 years attending general practice clinics.

The present study, part of a set of studies called FASEM, focused on rural-urban differences among the women of the FASEM study. The two-stage sampling was the same for both the larger and the present study. The first stage involved a stratified random sample (for provinces and home environment) of 1401 Spanish GPs, one in seven active Spanish GPs. The overall response rate was 87.1% (1221 GPs in 329 areas in 50 Spanish provinces). The second stage involved a random sample of all women aged 45-65 years who were on the health registers of participating GPs (all women living in his/her area). A systematic sampling technique was used to select every fifth woman. Each GP then personally invited the selected women from his or her practice to take part in the study.

The questionnaire used had been designed and pre-tested specifically for the study, although it was not validated. Informed consent was obtained for every woman who agreed to enter the study.

Women were excluded for the following reasons: gynaecological cancer, bilateral oopherectomy, dementia, organic brain syndrome or Alzheimer's disease, missing data for menopausal status or symptoms, or under 55 years with a history of hysterectomy.

Measurements

The questionnaire contained 21 questions addressing sociodemographic factors, medical history and lifestyle factors. Sociodemographic factors included age, marital status, urban or rural living environment (the majority of its active population was involved in agricultural production or services related to local life), educational level and social level. Marital status was categorised as married, unmarried (woman not living with partner), widowed or divorced or separated. Participants' educational levels were divided into four levels: lower than primary education, primary education

(school attendance up to age 10 years), secondary education (school attendance up to age 17 years) and university education. Social level was estimated by assessing financial income and employment status. The scale used was proposed by the Spanish Society of Epidemiology[3] and the results were grouped into three categories: low, intermediate and high.

Medical history questions related to: (a) personal and family background – family history of osteoporosis, personal history of fracture, medication use predisposing to osteoporosis (including oral glucocorticoids, anticonvulsants and anti-thyroids) used for at least 90 days, and diseases at risk for osteoporosis (eg chronic hepatopathy, hyperthyroidism and hyperparathyroidism); (b) gynaecological data – gynaecological history and menopausal symptoms; and (c) physical data – BMI, blood pressure, blood glucose and lipid levels.

Body mass index was categorised as normal weight (BMI 18.5-24.9), overweight (BMI 25-29.9), obesity I (BMI 30-34.9), obesity II (BMI 35-39.9) and obesity III (BMI ≥40). A positive family history was recorded when the women had a first degree female relative who had sustained a fracture of the hip or wrist as a result of osteoporosis. The systolic and diastolic blood pressure values used in the analysis as outcomes were averages of the second and third readings (2 min apart). Hypertension was defined as systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥ 90 mmHg or currently on treatment with antihypertensive medication. Hypercholesterolemia was defined as total serum cholesterol ≥230 mg/dL and diabetes as total serum glucose ≥126 mg/dL.

Lifestyle factors were alcohol intake, smoking status, consumption of dairy products and degree of exercise. Tobacco use was categorised as non-smoker, 1-10 cigarettes per day, 11-20 cigarettes per day and >20 cigarettes per day. Alcohol use was categorised as no alcohol, 1-5 drinks per day (moderate drinkers) and >6 drinks per day (heavy drinkers). A diet with poor dairy product content (and therefore low in calcium) was recorded if <500 mL milk per day was consumed, with cheese, yoghurt, ice cream or milk pudding

taken once a week or less. Two questions were used to assess exercise on the questionnaire. Moderate exercise was defined as 'exercise or work lasting 30 min or more without stopping'. Weight-bearing exercise was defined as 'exercise where your legs bear your body weight, such as walking, jogging, dancing, or weight training'. Exercise was categorised as never, less than once per week, 1-2 times per week and at least 3 times per week.

Women were classified as peri- or postmenopausal, according to the Straw (Stages of Reproductive Aging Workshop) definitions[4]. Thus, perimenopause was defined as the time around menopause during which menstrual cycle and endocrine changes are occurring but 12 months of amenorrhea has not yet occurred. Post-menopause begins at the time of the last menstrual period, although it is not recognised until after 12 months of amenorrhea.

A cumulative symptom score, the Kupperman index[5], was used to classify the severity and intensity of menopausal symptoms, using 11 dimensions (hot flushes/night sweats, paraesthesia, insomnia/sleep disturbances, depression, irritability, dizziness, tiredness/weakness, arthralgia/myalgia, headache, palpitations and tingling). The scores range from 0 to 3 (none, mild, moderate and severe). Each complaint was scored individually and multiplied by its rate of importance: hot flushes (4), paraesthesia (2), insomnia (2), irritability (2), and all other symptoms (1). The sum of these scores presents an estimation of overall severity from menopause (none: 0-14 points; mild: 15-20; moderate 21-35 and severe: >35).

Statistical analysis

Data were analysed using the SPSS (www.spss.com). Quantitative variables are expressed as mean and standard deviation (SD) and qualitative variables as percentages with 95% confidence intervals (CI). Categorical variables were compared using $\chi 2$ test (with Yates correction when necessary) or Fisher's exact test. A logistic regression analysis was carried out with the presence of severity of the menopausal symptoms as a dependent variable and

progressive elimination of independent variables (sociodemographic, medical history and lifestyle factors). A p-value <0.05 was considered significant.

Ethics approval

This study was approved by the institutional ethical review committee of the Guadalajara Health Area (#12/05).

Results

The sample was 12 068 women, 168 of whom were excluded according to study criteria, and 1386 declined the invitation to participate. The remaining 10 514 women enrolled in the study were divided into two subgroups: 69.7% urban (7327 women) and 30.3% were rural (3187 women). The mean age of the sample was 57.9 (±7.1) years. Their sociodemographic data are presented according to home location (Table 1).

The prevalence of risk factors for cardiovascular disease among the population studied was 74.8% (7864 women). Of these, 3209 (40.8%) presented one risk factor, 2406 (30.6%) two, 1478 (18.8%) three and 771 (9.8%) more than three. Obesity (46.1%), hypercholesterolemia (37.5%) and arterial hypertension (35.5%) were the most common cardiovascular risk factors in the rural population, while in the urban it was obesity (43.5%), arterial hypertension (37.2%) and smoking (33.4%) (Table 2).

Risk factors for osteoporosis were identified in 7107 patients (67.6%), of whom 2754 (38.7%) had one risk factor, 2189 (30.8%) two, 1359 (19.1%) three and 805 (11.3%) more than three. Among risk factors for osteoporosis in the rural women, 46% did no exercise, 43.1% were taking medication that could influence bone metabolism and/or increase risk of fracture and 24.4% had a poor dairy content diet; whereas in the urban women, 56.9% did no exercise, 47.1% were taking at-risk medication and 28.7% smoked (Table 2).

The most common symptoms experienced by urban menopausal women were hot flushes (49.9%), insomnia

(46.9%) and irritability (43.4%); whereas in the rural women these were hot flushes (55%), sleeping problems (42.8%) and depressive mood (41.7%) (Table 3). In general, a significant increasing trend in the rate of menopausal symptoms was observed from peri- to postmenopause in both urban and rural women. The prevalence of joint pain and depressive mood was higher in perimenopausal than in postmenopausal women in both groups although it was not statistically significant (Table 3).

Rural women had the highest frequencies of 4 of the 11 symptoms (hot flushes, depressive mood, joint pain and tingling), whereas urban women had the highest frequency of 7 symptoms. The difference was statistically significant in rural women for hot flushes (Table 4).

Symptoms were severe in 3.3% of the sample, moderate in 27.3%, mild in 24.6% and 44.8% had no symptoms. In the rural women symptoms were severe in 2.7% of the sample, moderate in 27.7%, mild in 24.7% and 44.9% had no symptoms, while in the urban environment they were severe in 3.7%, moderate in 27.6%, mild in 24.9% and 43.8% had no symptoms. Rural women had statistically significantly (p<0.01) fewer symptoms. The distribution of menopausal symptom intensity is shown according to age, marital status, home location, educational level and social status (Table 5).

In the logistic regression analysis, the variables age, BMI, smoking, social status and low consumption of dairy products contributed significantly and independently to the severity of menopausal symptoms (Table 6). The variable home location did not influence this severity.

Discussion

This study forms is part of a more extensive work entitled FASEM, which was carried out across Spain and whose general data have already been published[6]. The authors of this work were concerned with analysing the possible differences between rural and urban peri- and postmenopausal women, bearing in mind that these two populations had different lifestyles, age, marital statuses, educational and economic levels.

Table 1: Sample distribution according to age, marital status, educational level and menopausal status and home location

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Characteristic	Frequency n (%)	Location-n (%)	
		Urban	Rural
Age (years)			
45-50	2383 (22.7)	1792 (24.4)	591 (18.5)
51-54	1023 (9.7)	741 (10.1)	282 (8.8)
55-59	3829 (36.4)	2631 (35.9)	1198 (37.6)
60-65	3279 (31.2)	2163 (29.5)	1116 (35)
Marital status			
Married	7223 (68.7)	4677 (63.8)	2546 (79.9)
Unmarried	854 (8.1)	768 (10.4)	86 (2.7)
Widowed	1526 (14.5)	1091 (14.9)	435 (13.6)
Divorced/ sep	911 (8.7)	791 (10.8)	120 (3.8)
Educational level			
<Primary	1348 (12.8)	673 (9.2)	675 (21.2)
Primary	5451 (51.9)	3239 (44.2)	2212 (69.4)
Secondary	2821 (26.8)	2531 (34.5)	290 (9.1)
University	894 (8.5)	884 (12)	10 (0.3)
Social level			
Low	1641 (15.6)	959 (13.1)	682 (21.3)
Intermediate	7713 (73.3)	5459 (74.5)	2254 (70.7)
High	1160 (11.1)	909 (12.4)	251 (7.9)
Menopausal status			
Peri	3298 (31.4)	2359 (32.2)	939 (29.5)
Post	7216 (68.6)	4968 (67.8)	2248 (70.5)

Sep, Separated.

This study found statistically significant differences between urban and rural populations regarding some cardiovascular risk factors, the frequency of hot flushes and the severity of menopausal symptoms. The rural sample was an older population, with lower educational and economic levels and a lower proportion of single, widowed or divorced women (Table 1).

Interpretation of the findings in the light of evidence

Cardiovascular risk factors: A high prevalence of cardiovascular risk factors (74.3%) was found throughout the whole sample studied. A higher percentage of cardiovascular risk factors was observed in the urban environment (74.6%) compared with the rural (73.6%). Although the difference was not statistically significant it should be taken into account given that the rural population was of older average age, as other authors have suggested[7,8].

The most prevalent risk factor in both communities was obesity, followed by hyperglycaemia and high blood pressure in the rural women, and high blood pressure and smoking in urban women. There was a significant difference in favour of the rural women in obesity and hyperlipemia, and in the urban women in diabetes, smoking and alcohol consumption, while the prevalence of high blood pressure was similar in both. These differences may be due to urban women having more westernised lifestyles[9]. Overall, these results are consistent with other studies, finding that these are the most prevalent cardiovascular risk factors in menopausal woman[10-13].

Table 2: Prevalence of risk factors for cardiovascular disease and osteoporosis according to home location

Risk factor	Urban		Rural		p-value*
	n (%)	95% CI	n (%)	95% CI	
Cardiovascular disease					
Arterial hypertension	2726 (37.2)	(36.1-38.3)	1131 (35.5)	(34.6-36.4)	NS
Dyslipidaemia	2111 (28.8)	(27.7-29.9)	1198 (37.5)	(36.3-38.7)	<0.001
Diabetes	1090 (14.8)	(14-15.6)	354 (11.1)	(10.5-11.7)	<0.01
Obesity	3191 (43.5)	(42.3-44.7)	1469 (46.1)	(48.9-47.3)	<0.01
Overweight	2524 (79.1)[a]	(78.2-80)	1075 (73.1)[a]	(72.4-73.8)	<0.01
Obesity I	567 (17.7)[a]	(16.9-18.5)	297 (20.2)[a]	(19.6-20.8)	<0.05
Obesity II	81 (2.5)[a]	(2.2-2.8)	75 (5.1)[a]	(4.8-5.4)	<0.01
Obesity III	22 (0.7)[a]	(0.5-0.9)	19 (1.6)[a]	(1.4-1.8)	<0.05
Smoking status	2447 (33.4)	(32.3-34.5)	577 (19)	(16.1-20.1)	<0.001
0-10	773 (31.6)[b]	(30.8-32.4)	273 (47.3)[b]	(46.5-48.1)	<0.001
10-20	1209 (49.4)[b]	(48.5-50.2)	232 (40.2)[b]	(39.4-50)	<0.001
>20	465 (19)[b]	(18.7-19.3)	72 (12.5)[b]	(12.3-12.7)	<0.001
Alcohol intake	1011 (13.7)	(13.1-14.3)	217 (8.7)	(8.4-9)	<0.01
Moderate	940 (92.9)[c]	(92.3-93.5)	204 (93.9)[c]	(93.4-94.4)	NS
Heavy	71 (7.1)[c]	(6.9-7.3)	13 (6)[c]	(5.8-6.2)	<0.05
Osteoporosis					
Family history Personal history	1678 (22.9)	(22.2-23.6)	768 (24.1)	(23.6-24.6)	NS
No exercise	428 (5.8)	(5.6-6)	188 (5.9)	(5.7-6.1)	NS
Poor dairy intake	4169 (56.9)	(55.7-58.1)	1466 (46)	(41.9-46.9)	<0.001
Alcohol intake	2351 (32.1)	(31.2-33)	814 (25.4)	(24.7-26.1)	<0.01
Smoking status	1011 (13.7)	(13.1-14.3)	217 (8.7)	(8.4-9)	<0.05
Medication use	2447 (33.4)	(32.3-34.5)	577 (19)	(16.1-20.1)	<0.001
Benzodiazepines	3451 (47.1)	(45.9-48.3)	1375 (43.1)	(42-44.2)	<0.01
Oral hypoglycemics	1495 (20.4)	(19.5-21.3)	511 (16)	(15.4-16.6)	<0.01
Thyroid hormones	637 (8.7)	(8.5-8.9)	265 (8.3)	(8.1-8.5)	NS
Risk diseases	277 (3.7)	(3.6-3.8)	124 (3.9)	(3.8-4)	NS
COPD	1605 (21.9)	(21.2-22.6)	640 (20)	(19.4-20.6)	<0.05
Type I diabetes	286 (3.9)	(3.7-4.1)	105 (3.3)	(3.1-3.5)	<0.05
Hyperthyroidism	299 (4.1)	(3.9-4.1)	69 (2.3)	(2.2-2.4)	<0.05
Prolonged immobilization	256 (3.5)	(3.4-3.6)	97 (3)	(2.9-3.1)	<0.05
Observed weight loss	381 (5.2)	(5.1-5.3)	101 (3.2)	(3.1-3.3)	<0.05
>10% in 10 years	754 (10.3)	(10-10.6)	231 (7.2)	(7-7.4)	<0.05

COPD, Chronic obstructive pulmonary disease; NS, not significant.

*Pearson's χ^2; a, % between obese; b, % between smokers; c % between alcohol drinkers.

Cardiovascular disease is considered the major cause of mortality in women from industrial western countries, especially from 50 years onwards, coinciding with the onset of the menopause and the metabolic changes that occur peri- and post-menopause. It is fundamental for physicians caring for menopausal women to advise, diagnose and treat all modifiable risk factors, including diabetes[14], with special emphasis on blood pressure, which is considered the most important determinant in morbidity and mortality due to cardiovascular disease in these women[15,16].

Risk factors for osteoporosis: It was found that 67.6% of women from the sample had at least one risk factor for osteoporosis (68.1% urban compared with 66.5% rural), although the difference was not significant, and this is consistent with the literature[17-19]. In both communities the most prevalent risk factor was 'no exercise'. In rural women it was followed by poor dairy intake, while in urban women it was smoking. According to other studies[20,21], these are the most frequent osteoporosis risk factors in menopausal women.

Table 3: Frequency of menopausal symptoms in rural and urban women according to menopause status

Symptom	Frequency n (%)	Menopausal status-n (%)		p-value*
		Peri–	Post–	
Urban	N=7327	n=2359	n=4968	
Hot flushes, sweating	3656 (49.9)	884 (37.5)	2842 (57.2)	<0.001
Paresthesia	2044 (27.9)	517 (21.9)	1527 (30.7)	<0.01
Sleeping problems	3436 (46.9)	882 (37.4)	2554 (51.4)	<0.001
Irritability	3180 (43.4)	828 (35.1)	2352 (47.3)	<0.001
Depressive mood	2788 (38)	941 (39.9)	1847 (37.1)	NS
Dizziness	1824 (24.9)	451 (19.1)	1372 (27.6)	<0.01
Fatigue/weakness	2301 (31.4)	508 (21.5)	1793 (36.1)	<0.001
Joint pains	2802 (38.2)	918 (38.9)	1884 (37.9)	NS
Headaches	2329 (31.7)	701 (29.7)	1628 (32.7)	NS
Heart palpitations	2059 (28.1)	550 (23.3)	1509 (30.3)	<0.01
Tingling	1493 (20.3)	434 (18.4)	1059 (21.3)	NS
Rural	N=3187	n=939	n=2248	
Hot flushes, sweating	1753 (55)	362 (38.5)	1391 (61.9)	<0.001
Paresthesia	823 (25.8)	201 (21.4)	622 (27.7)	<0.01
Sleeping problems	1365 (42.8)	346 (36.9)	1019 (45.3)	<0.01
Irritability	1260 (39.5)	320 (34.1)	940 (41.8)	<0.01
Depressive mood	1329 (41.7)	395 (42.1)	934 (41.5)	NS
Dizziness	718 (22.5)	170 (18.1)	548 (24.3)	<0.01
Fatigue/weakness	886 (27.8)	164 (17.4)	722 (32.1)	<0.001
Joint pains	1313 (41.2)	388 (41.3)	925 (41.1)	NS
Headaches	857 (26.9)	218 (23.2)	639 (28.4)	<0.05
Heart palpitations	767 (24.1)	179 (19.1)	588 (26.2)	<0.01
Tingling	727 (22.8)	184 (19.6)	543 (24.1)	<0.05

NS, not significant.

*Pearson χ^2-Significant difference between peri- and postmenopausal women.

Table 4: Menopausal symptom differences between rural and urban women

Menopausal symptom	Location – n (%)		p-value*
	Rural	Urban	
Hot flushes, sweating	1753 (55)	3656 (49.9)	<0.01
Paresthesia	823 (25.8)	2044 (27.9)	NS
Sleeping problems	1365 (42.8)	3436 (46.9)	<0.05
Irritability	1260 (34.1)	3180 (43.4)	<0.001
Depressive mood	1329 (41.7)	2788 (38)	NS
Dizziness	718 (22.5)	1824 (24.9)	NS
Fatigue/weakness	886 (27.8)	2301 (31.4)	<0.05
Joint pains	1313 (41.2)	2802 (38.2)	NS
Headaches	857 (26.9)	2329 (31.7)	<0.05
Heart palpitations	767 (24.1)	2059 (28.1)	NS
Tingling	727 (22.8)	1493 (20.3)	NS

NS, not significant.

*Pearson χ^2 significant difference between rural and urban women.

Table 5: Distribution of Kupperman index according to age, marital status, educational level, social class and home location

Characteristic	Kuppermann index – n (%)			
	None	**Mild**	**Moderate**	**Severe**
Age (years)				
45-50	1218 (51.1)*	539 (22.6)	567 (23.8)	59 (2.4)
51-54	409 (39.9)	254 (24.8)	288 (28.2)	72 (7)*
55-59	1529 (39.9)	968 (25.3)	1175 (30.6)*	157 (4.1)
60-65	1554 (47.3)	825 (25.1)	841 (25.6)	59 (1.8)
Marital status				
Married	3234 (44.8)	1822 (25.2)	1939 (26.8)	228 (3.2)
Unmarried	436 (51.1)**	186 (21.8)	212 (24.8)	20 (2.3)
Widowed	653 (42.8)	360 (23.6)	446 (29.2)	67 (4.4)
Divorced/ separated	387 (42.5)	218 (23.9)	274 (30.1)*	32 (3.5)
Educational level				
<Primary	590 (43.8)	316 (23.4)	389 (28.8)	53 (3.9)
Primary	2346 (43)	1393 (25.6)	1517 (27.8)	195 (3.6)
Secondary	1325 (47)	672 (23.8)	742 (26.3)	82 (2.9)
University	449 (50.2)*	205 (22.9)	223 (24.9)	17 (1.9)
Social level				
Low	799 (48.7)	372 (22.7)	383 (23.3)	87 (5.3)*
Intermediate	3323 (43.1)	1919 (24.9)	2218 (28.7)**	253 (3.2)
High	588 (50.7)	295 (25.4)	270 (23.7)	7 (0.6)
Home location				
Urban	3249 (44.3)	1822 (24.9)	1998 (27.3)	258 (3.5)
Rural	1461 (45.8)	764 (24)	873 (27.4)	89 (2.8)

Pearson χ^2: *$p<0.01$; **$p<0.001$.

Table 6: Significant variables associated with the severity of menopausal symptoms

Variable	Coefficient[†]	Odds ratio	CI 95%
Constant	-0.0121	0.06	(0.02-0.10)
Age	0.2898	2.12	(1.84-2.40)
BMI	0.0221	3.64	(2.96-4.32)
Smoking	0.1814	1.92	(1.21-2.63)
Social class	0.5426	1.41	(1.28-1.54)
Low consumption dairy products	-0.5426	2.13	(2.04-2.21)

[†]Coefficients of the multivariate analysis.
Estimation technique: logistic regression (logit binomial model); contrast method: indicator; Cox and Snell R^2=0.210; Nagelkerke R^2=0.328.

Cardiovascular disease is considered the major cause of mortality in women from industrial western countries, especially from 50 years onwards, coinciding with the onset of the menopause and the metabolic changes that occur peri- and post-menopause. It is fundamental for physicians caring for menopausal women to advise, diagnose and treat all modifiable risk factors, including diabetes[14], with special emphasis on blood pressure, which is considered the most important determinant in morbidity and mortality due to cardiovascular disease in these women[15,16].

Risk factors for osteoporosis: It was found that 67.6% of women from the sample had at least one risk factor for osteoporosis (68.1% urban compared with 66.5% rural), although the difference was not significant, and this is consistent with the literature[17-19]. In both communities the most prevalent risk factor was 'no exercise'. In rural women it was followed by poor dairy intake, while in urban women it was smoking. According to other studies[20,21], these are the most frequent osteoporosis risk factors in menopausal women.

It is surprising that 45.9% of women in the sample (47.1% in the urban environment and 43.1% in the rural environment) were taking medication that increased their risk of osteoporosis, and this is a higher percentage than in another study[22]. With close to one in two of the women studied taking medication that might alter bone metabolism, and not all these being used to treat menopausal symptoms, this might indicate over-treatment of some menopausal women.

During perimenopause, both the quantity and quality of bone reduces, causing an increased risk of bone fracture in postmenopausal women. Although many of the factors associated with osteoporosis fractures are well-known, measures to identify and treat women at risk are not used routinely in clinical practice, leading to a diagnosis of osteoporosis only after a fracture[9]. It is therefore important to identify menopausal women at risk, especially those who undergo early menopause, who may benefit from early intervention r to maintain or increase their bone mass.

Prevalence of menopausal symptoms: The prevalence of menopausal symptoms in the sample was higher in urban (89.6%) than rural women (87.6%), although not significantly so, in agreement with other studies[23]. However, other authors in central Spain found the opposite[24], although their study population was smaller, closely associated with a specific geographic location and contained a larger number of variables.

In both urban and rural women there were high rates of hot flushes and insomnia; however, the groups differed according to the third most prevalent symptom: irritability in urban and depression in rural women. Compared with urban women, rural women had a higher frequency of hot flushes, depression, joint pain and tingling symptoms. This disparity, especially in the frequency of hot flushes where the difference was statistically different, suggests that home location has an impact. However, it is not easy to explain this with social, economic and demographic diversities because other factors must also play an important role, such as structural differences in the two environments[24]. The importance of correctly addressing these symptoms is highlighted, for insomnia, tiredness and irritability may affect daily activities, as well as family and social relationships.

Symptom differences between peri- and postmenopausal women: In the main sample, perimenopausal women had a higher (not significant) frequency of two of the listed symptoms (joint pains and depression), while postmenopausal women suffered from the nine remaining symptoms, eight of which were statistically significant. These results were reproduced in the present study, although there was a greater proportion of perimenopausal rural women (not statistically significant) with depression and joint pains.

In line with other studies[23,25], it was observed that joint pains were a major problem for perimenopausal women, affecting their quality of life. The present study also found that depression affected perimenopausal women more, which suggests the importance of the period prior to the menopause in its effect on women.

Severity of menopausal symptoms: According to other authors, the factors most related to an increase in suffering from severe menopausal symptoms are smoking, maternal history, a history of premenstrual pain, high body temperature, little physical activity and low socioeconomic status[26,27].

Other studies agreed that obesity[28,29] and smoking[28,30] play an important role in an increased risk of hot flushes; however, a correlation between menopausal symptoms and low

socioeconomic status has also been considered[31]. Unlike some studies[32,33], the present study found no statistically significant association between performing physical exercise and alcohol intake with greater severity of menopausal symptoms, consistent with other studies[34,35].

Although rural women had significantly less severe menopausal symptoms, rural or urban home location did not contribute significantly or independently to the severity of symptoms.

Strengths and limitations

Regarding the methodology of the study, the authors consider that the sample to be adequately representative of the population visiting their GP in Spain. However, it should be noted that its strength is the lack of a self-selection bias by GPs, guaranteed by the random sampling procedure. Moreover, the selection of GPs was made uniformly and can therefore be regarded as representative of Spain as a whole.

Regarding limitations, as the group of interviewees was large, the classification criteria of some variables may not have been uniformly applied throughout the study. Furthermore, some data may be biased by under-reporting (eg substance abuse such as smoking and alcohol intake), although in such a large sample this had no significant effect on the final results. The Kupperman Index is not validated according to psychometric standards[36,37]; however, it is still in use in medical practice to monitor menopausal symptoms and is widely accepted. Another limitation is that only the population attending clinical practice was studied, so the sample cannot be considered representative of the entire general population. However, the authors believe this point is nominal as more than 90% of the Spanish population attends clinical practice and therefore the results obtained should be quite similar to those in the general population.

Conclusions

The observational study revealed certain differences between urban and rural population with respect to some cardiovascular risk factors, frequency of hot flushes and severity of menopausal symptoms that may be explained by the complex interaction among biological, ecological and behavioural factors. The results of the present study should be confirmed by future research.

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