Age at menopause, motives for consultation and symptoms reported by 40–59-year-old Mexican women

D. Legorreta, J. A. Montaño, I. Hernández†, C. Salinas‡ and J. A. Hernández-Bueno** on behalf of the AMEC Research Committee*

General Coordinator of the Research Committee of AMEC and private practice, Mexico City; *President of AMEC and General Hospital, Climacteric Clinic, Mexico City; †Adjunct Secretary of AMEC and Hospital Juárez, Mexico City; ‡Angeles Hospital, Puebla; **Clinic for Woman's Integral Medical Attention, AC, Naucalpan de Juárez, Mexico

Key words: AGE AT NATURAL MENOPAUSE, MEXICAN CLIMACTERIC WOMEN, MRS SYMPTOMS

ABSTRACT

Objectives To assess the mean age at natural menopause, primary initial motives for consultation, symptoms and factors related to a more severe symptom profile using the Menopause Rating Scale (MRS) in a nationwide sample of middle-aged women in gynecological clinics in Mexico.

Methods A total of 4548 women, 40–59 years old were surveyed in gynecological clinics throughout all regions in Mexico.

Results The mean age at natural menopause was 47.9 ± 3.82 years. The primary initial motive for consultation was a preventive examination (40.3%). Significant differences (p values by ANOVA) were observed for the mean total and subscale MRS scores, with the exception of urogenital symptoms, between women in the sub-samples from different Mexican regions. The highest mean MRS total scores were observed for women living in the South (9.08 ± 8.20) and the Center-East (8.55 ± 6.74) regions. The national mean MRS total score was 8.19 ± 6.82. An MRS total score ≥ 17, which is considered severe, was observed for 5.2% of women with a regular cycle, 10.5% with more than 7 days of irregularity, 22.6% with more than two absent cycles, 13.1% that had undergone natural menopause, 16% with a hysterectomy, and 21.2% with a bilateral oophorectomy. The five most frequently reported symptoms were: physical and mental exhaustion (61%), irritability (54.2%), depressive mood (54.2%), sleeping problems (53.3%), joint and muscular discomfort (52.8%).

Conclusions Differences in the prevalence and severity of MRS symptoms were observed for women from different Mexican regions. MRS symptoms were more frequent and severe in women who had undergone a bilateral oophorectomy or with more than two absent cycles.

INTRODUCTION

The transitional stage during the mid-life of women characterized by passage from the reproductive to non-reproductive stage, i.e. the climacteric, is a different experience for each woman depending on biological and social factors, such as genetics, cultural beliefs and attitudes, lifestyle habits, educational level, marital status, and the type of community where the woman lives as well as altitude or climate. In recent cross-cultural and national studies conducted by the Collaborative Group of Research of the Climacteric in Latin America (REDLINC), these combined factors were found to influence the climacteric experience, including symptom prevalence and menopausal age[1,2]. These studies included Mexico, which was represented by an urban sample from Mexico City[1,3]. Other previous studies on the menopausal transition in Mexican women were based on samples from either public[4] or private[5] medical centers, although other studies have focused on comparing urban and rural populations with small samples from specific communities[6–8].

Mexico is the fifth largest country in America, with a 1 964 375 km^2 territory[2]. Regional demographic, ethnic and

Correspondence: Dr D. Legorreta, LPA, Newton 54-4, Polanco, Mexico City, 11560 Mexico

ORIGINAL ARTICLE

DOI: 10.3109/13697137.2012.696288

Received 20-01-2012
Revised 07-05-2012
Accepted 19-05-2012

economic differences that may impact lifestyle, eating habits, educational opportunities and health services are significant in Mexico. All of these factors may impact the climacteric experience, as has been observed in other Latin-American countries[9]. According to the 2010 Mexican National census[10], women in this country compose 51.2% of the total population (112 337 million). They exclusively support 24.6% of all households and compose approximately 40% of the entire workforce. Of special medical interest is that 24.6% of all handicapped Mexicans are women 60–84 years old compared with only 4.6% of 30–59-year-olds. Therefore, mid-life should be considered as a critical window of opportunity to preserve the future health and quality of life of Mexican women. However, basic information concerning the climacteric transition, based on a nationwide sample of women who consult gynecologists, has never been assessed.

These arguments were the basis for a national survey to explore the experience and general health profile during this stage of life using a representative sample comprising 40–59-year-old women from all regions, types of communities, marital statuses, occupations and educational levels who consult gynecological medical services. This survey was selected as the first research project for the 2010–2011 Mexican Association for the Study of the Climacteric (AMEC from its Spanish initials) Research Committee (RC).

The purpose of this study was to assess the clinical characteristics of the mean age at natural menopause, the primary initial motives for climacteric consultation, and the most frequent symptoms in climacteric Mexican women using the Menopause Rating Scale (MRS) as a validated instrument which has been widely used in the Latin-American region.

METHODS

This was an exploratory, multi-center, cross-sectional study with national coverage. The sampling strategy for the 2010–2011 ENACLIM-AMEC Survey (National Climacteric Survey of the Mexican Association for the Study of the Climacteric; in Spanish: Encuesta Nacional de Climaterio-Asociación Mexicana para el Estudio del Climaterio) was similar to that established for the Mexican National Health and Nutrition Survey 2006[11] and was based on the following criteria. Four regions were established.

Region 1: Center-East Of the entire Mexican population, 33.84% live in this region, which includes the Federal District (Mexico City), State of Mexico, Hidalgo, Morelos, Puebla, Queretaro and Tlaxcala. Climate and orographic conditions vary, but the weather is mild most of the year. The two cities located at the highest altitudes, Toluca and Mexico City, are in this region.

Region 2: Center This region includes 22.92% of the Mexican population that lives in the following states: Aguascalientes, Colima, Durango, Guanajuato, Jalisco, Michoacán, Nayarit, San Luis Potosi and Zacatecas. The weather is mild most of the year.

Region 3: North This region comprises 20.17% of the Mexican population and includes Baja California, Baja California Sur, Chihuahua, Coahuila, Nuevo Leon, Sinaloa, Sonora and Tamaulipas. This region shares its frontier with the USA and is highly influenced by that country's culture and lifestyle. The third largest city, Monterrey, is located in this region, but the North also includes very isolated rural communities in the desert and mountain areas. Most of this region has very dry and extreme weather conditions.

Region 4: South Of the Mexican population, 23% lives in this region, which includes Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz and Yucatan. The weather is tropical and therefore warm and humid. Most of this region's main cities are located at sea level.

Three types of communities were considered: urban ($\geq$ 100 000 inhabitants), suburban (2500–99 999 inhabitants), and rural ($<$ 2500 inhabitants).

Two types of health services are provided in Mexico: public and private. Users of both types were included in this sample.

Participants

The participants were 40–59-year-old women who consulted any of the participating gynecological clinics throughout the country during the last 2010 semester and the first 2011 semester. All women within the age range who attended the clinic for any reason during the survey dates were asked to participate, and the women who gave their written consent were included. Exclusion criteria included any significant mental or physical impediment and a woman's refusal to participate in the survey. The sample size calculation was based on the latest valid and official demographic data available when this project was initiated, which was the 2005 National Census. In the 40–59-year age range, Mexico has 9.4 million women and, according to the same official document, only 50% of all Mexican communities had access to either public or private health service providers[12]. A minimum sample size of 0.005% of the 40–59-year-old population of women living in each region was considered representative of the middle-aged women who consulted gynecological services in that area. Demographic regional distribution was considered to include a balanced sample of each region's urban, suburban and rural populations. Further, care was taken to include a proportional number of participants surveyed in either public or private health-care institutions in accordance with the availability of such services in each community. To ensure an evenly distributed sample, one last sample criterion was inclusion of 25% of women from each of the following age ranges: 40–44, 45–49, 50–54 and 55–59 years.

Variables included

The 2010–2011 ENACLIM-AMEC Survey questionnaire variables were selected by AMEC-RC members based on relevant

health-profile information for climacteric women. A preliminary questionnaire was tested through a pilot application given to 200 women in different urban and rural communities of Mexico. Based on these results, a final questionnaire was developed and included the following variables.

General data included region and state, type of community, type of medical service, age, marital status, educational level and occupation.

*The reproductive stage*s were defined as: (1) late reproductive, regular menstrual cycles; (2) transitional early, menstrual cycle irregularities >7 days; (3) transitional late, more than two absent cycles; (4) natural menopause; (5) hysterectomy; or (6) bilateral oophorectomy. The age (year) during their last menstrual period was recorded for women that had undergone natural menopause, a hysterectomy or a bilateral oophorectomy.

Women were asked to indicate their *primary concern or reason* for the gynecological consultation. Only the most important concern or reason was registered.

To allow for cross-cultural comparisons with the previously quoted REDLINC Latin-American studies, the Menopause Rating Scale (MRS, Spanish version) was used to record the symptoms reported by the women participating in this study because it had already been validated with Latin-American populations, including an urban Mexican sample. The MRS is divided into three subscales: *somatic* (hot flushes or vasomotor symptoms (VMS), heart discomfort, sleeping problems as well as muscle and joint problems); *psychological* (depressive mood, irritability, anxiety as well as physical and mental exhaustion); *urogenital* (sexual problems, bladder problems and vaginal dryness). Each symptom is rated by the subject on a scale from 0 to 4: 0, not present; 1, mild; 2, moderate; 3, severe; 4, very severe. The total MRS score is generated from the sum of scores in each subscale. A total MRS score ≥ 17 is considered indicative of a severe symptomatic profile[13,14].

Based on experts' clinical experience and the pilot test, four additional symptoms were assessed that are not included in the MRS but are often reported by Mexican middle-aged women during gynecological consultation. These symptoms are as follows: headaches, skin and hair dryness or changes, breast pain, and breast texture changes. Previous or current premenstrual psychological dysphoric symptoms such as mood swings, depressive mood, irritability or feeling unfocused were also recorded for an analysis separate from the MRS symptoms.

Current treatments for climacteric symptoms were recorded as none, hormonal or non-hormonal. Each woman was asked to mention all *other medications* that she was consuming at the time of the interview.

Women were asked about the following *lifestyle risk factors*: the presence or absence of tobacco, coffee, alcohol or illegal drug consumption as well as physical activity pattern, including sedentary and exercise activities during the week. Recent accidents, domestic violence and basic diet structure were also included in this survey.

As *risk factors related to relevant diseases*, the following were recorded: blood pressure, weight, height, waist circumference, bone fractures and densitometry results when available.

This first sub-study focused exclusively on age at natural menopause, the primary initial concern expressed by women during their first climacteric consultation, MRS symptoms and the use of hormonal or alternative treatments for climacteric complaints. Future studies will address other medical treatments, lifestyle risk factors, and risk factors related to relevant diseases.

Procedure

Each participant was informed about the purpose and general content of the 2010–2011 ENACLIM-AMEC Survey; written consent was requested, and the interview was conducted by a trained health professional who acted as a voluntary *pro bono* surveyor. The standardized questionnaire, including the items listed above, was filled out by the surveyor with the answers provided by the woman interviewed. As computers were not available to all surveyors, they were given the alternative to either fill out the questionnaire directly online or use a printed version. Printed questionnaires were recorded using the same online link by either the regional coordinators or AMEC personnel. The Surveymonkey program was the initial internet tool used to record the data, which was then converted into a working database after eliminating the invalid questionnaires.

Each participant's weight, height, waist circumference and blood pressure were also registered on the day of the survey, and the densitometry results for the women who had previously been tested were included. No laboratory tests to evaluate the hormonal profile of the participants were performed due to the high cost of such procedures. The reproductive stage was established according to the clinical criteria discussed above.

Statistical analysis

Statistical analysis was performed using the SPSS 15 and SYSTAT13 programs for basic and advanced statistics, respectively. Percentages, means $\pm$ standard deviations and medians were generated. χ^2 tests or analyses of variance (ANOVA) were used to compare the categorical and continuous variables, respectively. The logistic binomial stepwise regression model was used to assess the risk factors for severe MRS scoring, with the entry level considered at 0.20 as well as a $p < 0.05$ level of significance, and a goodness-of-fit test was performed for the model. The continuous variables entered in the model were transformed into categorical variables. MRS severe scoring (≥ 17) became the dependent variable, and the factors entered were as follows: climacteric status (from irregularities >7 days through postmenopause); postmenopausal (both natural and surgical); reported previous or current premenstrual dysphoric symptoms; non-user of hormone therapy; age category >50 years old; single; unemployed; rural; education <12 years. The following reference value was selected for the dependent variable: severe menopausal symptoms (MRS total score ≥ 17), no = 1. The following reference values were selected for the factors included in the model:

climacteric status, normal cycles = 1; postmenopausal, no = 1; premenstrual mood symptoms, no = 1; hormone therapy, yes = 1; age, < 50 years old = 1; living with spouse, yes = 1; employed, yes = 1; urban, yes = 1; education, ≥ 12 years, yes = 1. The older age and sociodemographic variables included were selected to test the predictive value of the biological, hormone-related versus age or sociodemographic variables previously discussed as mediating factors in a more severe symptomatic profile during mid-life in Mexican women[4,6,7].

RESULTS

Geographical and sample coverage results

All four regions and 30 of the 32 Mexican states were included in this survey, representing 93.75% of the Mexican population. Of the 6863 original sample estimate, 4869 women were interviewed, which is an 83.12% response rate. Additionally, 321 surveys were eliminated due to incomplete basic data, leaving 4385 valid cases for inclusion in the final database.

Sociodemographic and morphometric profiles

The mean age was 49.50 ± 5.63 years. The habitat distribution for the sample was urban (73.72%), suburban (15.1%) and rural (11.2%). Further, 58.7% were interviewed in public and 41.3% in private health-care institutions. The educational levels, marital statuses and occupational categories were represented in this sample with relevant regional differences in educational level, occupational and marital status between the different areas of Mexico represented (Table 1).

Basic mean body measurements of height, weight and waist circumference produced meaningful regional differences ($p < 0.001$) when compared using the ANOVA test and were consistent with previous national general health surveys and indicative of the different ethnic, eating and lifestyle profiles prevalent in Mexico[10].

Reproductive stages

In this sample, 24.6% of the women had normal menstrual cycles, 11.5% had irregular cycles for more than 7 days, 10.7% had more than two absent cycles, 33.8% were postmenopausal by natural menopause, 17.4% had undergone a hysterectomy, and 1.9% had a bilateral oophorectomy. The mean age at natural menopause was 47.9 ± 3.82 years, with no significant differences between regions (Table 2).

Initial motive for consultation

The primary reason for consultation cited by women in this sample was a preventive gynecological exam for 41.9% of women in an urban community and 35.7% in either suburban or rural areas. This reason for consultation was cited as the

Table 1 Sociodemographic and morphometric profile of sampled women in the four regions and nationally, as defined in the text. Data are given as the mean ± standard deviation or the percentage and number of participants

Characteristic	*Center-East*	*Center*	*North*	*South*	*National*
Age (years)	49.50 ± 5.63	49.22 ± 5.58	49.66 ± 5.50	48.16 ± 5.45	49.32 ± 5.58
Educational level (years)	12.98 ± 4.47	11.23 ± 4.0	11.26 ± 3.88	8.35 ± 5.15	11.64 ± 4.63
Type of community					
Urban	78.1% (1598)	63.3% (562)	84.6% (858)	55.8% (334)	73.7% (3352)
Suburban	13.8% (282)	28.5% (253)	5.3% (54)	16.4% (98)	15.1% (687)
Rural	8.2% (167)	8.2% (73)	10.1% (102)	27.9% (167)	11/.2% (509)
Type of medical service					
Public	48.1% (985)	65.3% (580)	61.4% (623)	79.5% (476)	58.6% (2664)
Private	51.9% (1061)	34.7% (308)	38.6% (391)	20.5% (123)	41.4% (1884)
Marital status					
Single	13.1% (269)	9.6% (85)	10.0% (101)	7.5% (45)	11.0% (500)
Married	63.9% (1308)	62.5% (555)	66.5% (674)	68.3% (409)	64.8% (2946)
Divorced/separated	13.6% (279)	12.7% (113)	11.9% (121)	11.0% (66)	12.7% (579)
Free union	4.7% (97)	7.3% (65)	6.7% (68)	9.0% (54)	6.2% (284)
Widow	4.6% (94)	7.9% (70)	4.9% (50)	4.2% (25)	5.3% (239)
Occupation					
Home	38.6% (791)	43.5% (386)	49.0% (497)	61.3% (367)	44.9% (2041)
Unemployed/retired	5.4% (109)	6.9% (61)	5.7% (58)	3.3% (20)	1.6% (75)
Employed, not professional	27.4% (559)	34.6% (307)	29.2% (296)	20.9% (126)	28.8% (1314)
Employed, professional	56.0% (586)	15.0% (134)	16.1% (163)	14.4% (86)	20.7% (943)
Morphometric data					
Height (cm)	157 ± 6.67	159 ± 6.61	158 ± 6.59	158 ± 6.90	158 ± 6.7
Weight (kg)	65.65 ± 11.02	71.12 ± 11.42	72.09 ± 11.81	68.11 ± 10.21	68.49 ± 11.62
Waist circumference (cm)	85.63 ± 12.63	88.91 ± 13.07	88.61 ± 12.17	86.24 ± 11.91	87.00 ± 12.61
Total valid sample	100% (2047)	100% (888)	100% (1014)	100% (599)	100% (4548)

Table 2 Reproductive stages and age at natural menopause of sampled women in the four regions and nationally, as defined in the text. Data are given as the mean ± standard deviation or the percentage and number of participants

Reproductive stage	*Center-East*	*Center*	*North*	*South*	*National*
Reproductive (regular menstrual cycle)	26.4% (520)	21.8% (187)	20.0% (195)	30.4% (176)	24.6% (1078)
Early transition (irregularities >7 days)	8.9% (175)	14.4% (124)	12.5% (122)	14.7% (85)	11.5% (506)
Late transition (>2 absent cycles)	9.3% (183)	9.4% (81)	11.3% (110)	16.6% (96)	10.7% (470)
Natural menopause	32.7% (644)	37.4% (321)	36.2% (353)	28.7% (166)	33.8% (1484)
With hysterectomy	21.3% (421)	14.8% (127)	16.4% (160)	9.3% (54)	17.4% (762)
With bilateral oophorectomy	1.5% (29)	2.2% (19)	3.6% (35)	0.3% (2)	1.9% (85)
Total valid cases	1972	859	975	579	4385
Age at natural menopause (years)	48.01 ± 4.32	48.01 ± 2.99	47.71 ± 3.45	47.42 ± 3.95	47.9 ± 3.82

primary motivator by 33.4% of all women interviewed in public health-care centers and 49.8% in private institutions. Other concerns cited as the primary motive for consultation were different for women in each transitional stage; VMS or cycle irregularities were the most frequently reasons cited by women in the transitional perimenopausal stages, and VMS or urogenital symptoms were the most frequent reasons cited by postmenopausal women (Table 3).

MRS symptoms by region

Significant differences (*p* values by ANOVA) in the mean total and subscale MRS scores, with the exception of urogenital symptoms, were observed between the sub-samples of women living in the different Mexican regions. The highest mean MRS total scores were observed for women living in the South (9.08 ± 8.20), followed by the Center-East region (8.55 ± 6.74). The national mean MRS total score was 8.19 ± 6.82, which is equivalent to moderate symptomatology according to the MRS scoring criteria (moderate 0–16). The most severe symptoms by regions were physical exhaustion in the Center-East (1.06 ± 1.00) and Center (1.12 ± 1.00) regions as well as VMS in the South (1.18 ± 1.36) and North (0.85 ± 1.01) (Table 4).

MRS symptoms by reproductive stage

The prevalences and mean scores for symptoms reported with any level of severity by women in this sample are reported in Table S1 to be found online at http://www.informahealthcare.com/doi/cmt/10.3109/13697137.2012.696288 according to the menopausal stage. The five most frequently reported symptoms were as follows: physical and mental exhaustion (61%), irritability (54.2%), depressive mood (54.2%), sleeping problems (53.3%), as well as joint and muscular discomfort (52.8%). The same five symptoms were also the most severe, although not in the same order. Physical and mental exhaustion (1.02 ± 1.02) was the most severe, followed by joint and muscular discomfort (0.91 ± 1.06), sleeping problems (0.89 ± 1.03), depressive mood (0.88 ± 1.00), and irritability (0.87 ± 1.00). Interestingly, although cited as the second primary motive for consultation, VMS (hot flushes, sweating) was reported by a lower percentage (48.0%) and as less severe (0.85 ± 1.07) by women in this sample.

Table 5 shows the mean MRS total and subscores for women in each stage. A relevant increase in total MRS mean score is identifiable as soon as the early perimenopausal stage (cycle irregularities for >7 days). The MRS total mean score is 5.22 ± 5.85 for women with regular menstrual periods, 7.43 ± 6.15 for women with irregularities for >7 days, and peaks in women that reported more than two absent cycles (MRS score 10.67 ± 7.57). Interestingly, this mean total score is lower in women that have undergone natural menopause (MRS score 8.87 ± 6.55) or a hysterectomy (MRS score 9.67 ± 6.90) compared with women during the late transitional stage. However, postmenopausal women with a bilateral oophorectomy were the most symptomatic group, with a mean total MRS score of 11.22 ± 7.84. The mean differences between women who reported a regular menstrual cycle and women already in either the climacteric transitional or postmenopausal stages were significant ($p < 0.0001$) for all MRS symptoms. The three most severe symptoms in climacteric women compared with women that reported regular cycles

Table 3 Three primary motives for initial consultation by reproductive stage. Data are given as the percentage of participants

Reproductive stage	*Motive 1*	*Motive 2*	*Motive 3*	*n*
Late reproductive	check-up (57.6%)	VMS (5.4%)	joint & muscular discomfort (5.1%)	1078
Early transition	cycle irregularities (45.2%)	check-up (19.9%)	VMS (6.5%)	506
Late transition	check-up & VMS (25.4%)	cycle irregularities (20.4%)		470
Natural menopause	check-up (39.3%)	VMS (18.8%)	urogenital symptoms (9.0%)	1484
With hysterectomy	check-up (42.5%)	VMS (17.9%)	urogenital symptoms (9.3%)	762
With bilateral oophorectomy	VMS (32.9%)	check-up (27.1%)	urogenital symptoms (11.8%)	85
Total sample	check-up (40.3%)	VMS (15.3%)	cycle irregularities (9.9%)	4385

VMS, vasomotor symptoms

Table 4 Menopause Rating Scale (MRS) symptom scores by region and the total national scores. The reference values for the severe symptoms are as follows: Somatic > 8, Psychological > 6, Urogenital > 3, and Total MRS ≥ 17

Region	*n*	*Somatic**	*Psychological**	*Urogenital*	*MRS total*	*Most severe symptom**
Center-East	1972	3.03 ± 2.63	3.59 ± 3.20	1.94 ± 2.24	8.55 ± 6.74	physical & mental exhaustion, 1.06 ± 1.00
Center	859	2.75 ± 2.42	3.52 ± 3.26	1.84 ± 2.17	7.77 ± 6.48	physical & mental exhaustion, 1.12 ± 1.00
North	975	2.57 ± 2.33	2.66 ± 2.87	2.13 ± 2.33	7.32 ± 6.23	vasomotor symptoms, 0.85 ± 0.94
South	579	3.38 ± 3.06	3.77 ± 3.77	1.98 ± 2.32	9.08 ± 8.20	vasomotor symptoms, 1.18 ± 1.36
p Value		< 0.0001	< 0.0001	< 0.041	< 0.0001	
Total national	4385	2.92 ± 2.60	3.39 ± 3.25	1.97 ± 2.26	8.19 ± 6.82	physical & mental exhaustion, 1.02 ± 1.02

*,The reference values are as follows: 0, not present; 1, mild; 2, moderate; 3, severe; 4, very severe

were as follows: physical and mental exhaustion (1.10 ± 1.03 vs. 0.76 ± 0.95); joint and muscular discomfort (1.00 ± 1.09 vs. 0.63 ± 0.92); and sleeping problems (1.00 ± 1.06 vs. 0.57 ± 0.88) (Table 6).

Other symptoms not included in the MRS

Four additional symptoms were included and rated separately with a scale similar to that used for the MRS symptoms (0, not present; 1, mild; 2, moderate; 3, severe; 4, very severe). The mean results were as follows: breast pain (0.36 ± 0.67); changes in breast texture (0.15 ± 0.47); skin and hair dryness (0.75 ± 0.99); headaches (0.83 ± 0.94). Additionally, 36.5% of all women in this sample reported that they had experienced or were experiencing the following premenstrual dysphoric symptoms while still having a menstrual period: irritability, depressive mood and crying more easily.

Hormonal treatments

In this sample, 67% of the 3307 women in a transitional stage, including the early stage (irregularities > 7 days) and late stage (> two absent cycles), with a hysterectomy or postmenopausal were not taking hormonal therapy for climacteric symptoms. Of all women in the postmenopausal stage, 40.6% (932) were receiving hormonal treatment, and only 4.14% (65) reported that they were using alternative non-hormonal treatments for climacteric symptoms.

Factors associated with a higher risk for severe MRS symptoms

Logistic binomial regression for the risk of severe symptoms (MRS score ≥ 17) showed that climacteric status (odds ratio (OR) 3.15; 95% confidence interval (CI) 2.38–4.18) and premenstrual dysphoric symptoms (OR 1.92; 95% CI 1.64–2.24) are more predictive than age > 50 years (OR 1.65; 95% CI 1.39–1.94) or sociodemographic variables, which include not living with spouse (OR 1.78; 95% CI 1.47–2.15), suburban or rural habitat (OR 1.70; 95% CI 1.47–1.96), unemployment (OR 1.38; 95% CI 1.16–1.63) and education < 12 years (OR 1.35; 95% CI 1.16–1.63). The use of hormone therapy had the lowest predictive value (OR 1.25; 95% CI 1.06–1.49), and the postmenopausal variable was eliminated from the model (score statistic = 0.59; χ^2 significance = 0.44, d.f. = 1.00) (Table 7).

DISCUSSION

The most important limitation of this study was the scarce availability of public institutional research grants or funds in Mexico. An open-population nationwide survey of this dimension would have been unaffordable for a non-profit institution such as the AMEC, and therefore, a survey based on women who attended gynecological clinics was used instead. The higher probability that women who consult specialists will experience more symptoms than women in an open-population study should be considered when these results are analyzed. Further,

Table 5 Menopause Rating Scale (MRS) scores by reproductive stage. The reference values for severe symptoms are as follows: Somatic > 8, Psychological > 6, Urogenital > 3 and Total MRS ≥ 17

Reproductive stage	*Somatic*	*Psychological*	*Urogenital*	*MRS Total*	*n*
Reproductive	1.84 ± 2.32	2.41 ± 2.92	1.02 ± 1.61	5.22 ± 5.85	1078
Early transition	2.63 ± 2.34	3.28 ± 2.96	1.68 ± 2.06	7.43 ± 6.15	506
Late transition	3.79 ± 2.77	4.60 ± 3.68	2.33 ± 2.42	10.67 ± 7.57	470
Natural menopause	3.23 ± 2.50	3.45 ± 3.16	2.32 ± 2.43	8.87 ± 6.55	1484
With hysterectomy	3.40 ± 2.70	3.87 ± 3.29	2.46 ± 2.43	9.67 ± 6.90	762
With bilateral oophorectomy	3.85 ± 2.63	4.40 ± 3.81	3.01 ± 2.70	11.22 ± 7.84	85
p Values by ANOVA	< 0.0001	< 0.0001	< 0.0001	< 0.0001	
Total sample MRS scores	2.92 ± 2.60	3.39 ± 3.25	1.97 ± 2.26	8.19 ± 6.82	4385

Table 6 Menopause Rating Scale (MRS) scores reported by women in late reproductive stage versus climacteric stage. The reference values are as follows: 0, not present; 1, mild; 2, moderate; 3, severe; 4, very severe. Data are given as mean ± standard deviation

MRS symptom	*Climacteric* (n = 3307)*	*Late reproductive† (n = 1078)*	*p Value*
Physical and mental exhaustion	1.10 ± 1.03	0.76 ± 0.95	0.0001
Joint and muscular discomfort	1.00 ± 1.09	0.63 ± 0.92	0.0001
Sleeping problems	1.00 ± 1.06	0.57 ± 0.88	0.0001
Vasomotor symptoms	0.99 ± 1.04	0.41 ± 0.81	0.0001
Depressive mood	0.97 ± 1.02	0.60 ± 0.90	0.0001
Irritability	0.94 ± 1.02	0.66 ± 0.91	0.0001
Sexual problems	0.91 ± 1.14	0.45 ± 0.85	0.0001
Vaginal dryness	0.84 ± 1.06	0.29 ± 0.65	0.0001
Anxiety	0.80 ± 0.99	0.44 ± 0.83	0.0001
Heart discomfort	0.39 ± 0.71	0.26 ± 0.63	0.0001
Bladder problems	0.58 ± 0.89	0.29 ± 0.65	0.0001

*, Early transitional (irregularities > 7 days), late transitional (more than two cycles absent), with hysterectomy, postmenopause after natural menopause or through bilateral oophorectomy; †, regular menstrual cycles

as expected in such a large multicenter study, a certain degree of methodological variations must be assumed. However, to our knowledge, the ENACLIM-AMEC survey is the first study to include Mexican women in the different stages of the climacteric or menopausal transition from all regions in the country, various types of communities and educational levels, all types of occupations and marital statuses, as well as users of both public and private health services. Additionally, due to the sampling strategy followed, age and reproductive stages were evenly distributed, thus ensuring a non-biased sample.

As previously mentioned, according to the 2010 National Census[10], 50% of all rural communities in Mexico do not have access to a health service provider, and the rural population in Mexico is 23.5%. This indicates that 11.75% of all Mexicans living in such communities have no access to health service providers. That 11.2% of the sample included in the 2010–2011 ENACLIM-AMEC Survey was rural and living throughout all regions in the country must be considered as representative of climacteric women living in those communities with medical services available. The inclusion of this portion of the sample was only possible thanks to the professional commitment of the research group members who made a special effort to survey women in the rural areas to include valuable information concerning this underprivileged group and their health needs in this study.

Table 7 Regression model for severe Menopause Rating Scale (MRS) total score

Factor	*Odds ratio*	*Standard error*	*95% confidence interval*
Biological hormone-related			
Climacteric status	3.28	0.48	2.47–4.36
Premenstrual dysphoric symptoms	1.91	0.15	1.63–2.23
Hormone therapy	1.25	0.11	1.06–1.49
Age ≥ 50 years	1.64	0.14	1.39–1.94
Sociodemographic			
Not living with spouse	1.76	0.17	1.45–2.12
Unemployed	1.33	0.12	1.12–1.58
Suburban/rural	1.59	0.13	1.36–1.85
Education < 12 years	1.34	0.12	1.12–1.60

The reference values are as follows: dependent variable, severe menopausal symptoms (MRS total score ≥ 17), no = 1. The factors included are: climacteric status, normal cycles = 1; premenstrual dysphoric symptoms, no = 1; hormone therapy, no = 1; age < 50 years = 1; living with spouse, yes = 1; employed, yes = 1; urban, yes = 1; education level ≥ 12 years, yes = 1.

The mean age for menopause found in this study, 47.9 years old, is slightly lower than the age previously reported by Bassol-Mayagoitia[8], who established 49.6 years as the mean natural menopause age in Mexico. However, it is similar to the age previously reported by Murillo and colleagues (48.1 years)[5], which was based on an urban sample of 1099 participants from a private health institution in Mexico City. The women in our study who lived in the South region had an earlier menopause (47.42 years) compared with the national average. Ethnic, weather or lifestyle factors that might underlie this result should be further explored.

Concerning the initial motive for consultation, the results indicate that preventive examinations were the primary reason why middle-aged women in this sample sought gynecological services from either public or private providers, with no significant differences between users of either type of health service. Throughout the past decade, a number of health awareness programs for middle-aged women involving media campaigns on specific issues such as osteoporosis, breast cancer and cardiovascular health have been conducted in Mexico. These educational efforts to promote periodical preventive exams could underlie this encouraging result, but we acknowledge that it could also be that the questionnaire allowed for only one answer to this question and therefore that other complaints could have been under-represented as relevant concerns that motivate women to seek medical attention.

One of the main goals of this study was to assess the prevalence, severity, regional and reproductive stage distribution of MRS symptoms in Mexico. Interestingly, a total MRS mean score of 9.4 ± 7.7 was previously reported for this country based on an open-population urban sample of 380 participants[1]. However, in this nationwide sample of 4548 women surveyed in health-care centers, the total MRS mean score was lower (8.19 ± 6.82), and there were significant ($p < 0.0001$) mean differences between the four regions studied. The partial mean scores for somatic, psychological and urogenital symptoms were also different from previous reports in the same multinational study and support a need to conduct future open-population and nationwide projects that may accurately portray all climacteric women in such a diverse country as Mexico.

The most relevant results by reproductive stage were related to the higher percentage (22.6% vs. 13.1%) and total MRS mean score (10.67 ± 7.57 vs. 8.87 ± 6.55) for women in the

late perimenopausal stage (>two cycles absent) compared with women that have undergone natural menopause. This result indicates that, during the late transitional stage, participants in this sample were experiencing the most bothersome symptoms.

Concerning the four additional non-MRS symptoms included, while both breast symptoms were not prevalent in this sample, the mean headache (0.83 ± 0.94) and skin/hair dryness (0.75 ± 0.99) scores were more severe than the mean MRS symptoms of anxiety (0.71 ± 0.97), bladder problems (0.51 ± 0.85), vaginal dryness (0.70 ± 1.0) and heart discomfort (0.35 ± 0.70). Based on these results, the development of a valid instrument that may include other symptoms not previously included in a climacteric scale or quality-of-life instrument are worth considering for Mexican populations.

In this study, the five most prevalent and severe symptoms during the climacteric transition were physical and mental exhaustion; joint and muscular discomfort; and sleeping problems, followed by depressive mood and irritability. Physical and mental exhaustion (tiredness) and joint and muscular discomfort were also the most prevalent symptoms in a recent multinational study that included participants from the UK, Japan, Canada, USA and China; only the Japanese sample did not experience tiredness as the most prevalent symptom or joint and muscular discomfort as the second[15]. Though VMS remain the best-known symptoms related to menopause, the results that report exhaustion or tiredness, muscular or joint problems and psychological symptoms as prevalent and severe in so many countries world-wide indicate that they should therefore be recognized as relevant health issues for climacteric women.

Concerning the more severe total MRS scores (≥ 17), the increased three-fold risk once the menopausal transition begins is evidence that the climacteric syndrome begins as early as the stage where the cycle varies for >7 days, and it persists until the postmenopausal years in this 40–59-year-old sample. Age >50 years alone only increases the risk of a severe MRS total score (OR 1.64; 95% CI 1.39–1.94), and previous or present premenstrual dysphoric symptoms reported by women increase the risk almost two-fold (OR 1.91; 95% CI 1.63–2.23). These results are consistent with the hypothesis that biological vulnerability to hormonal changes in certain women may manifest as premenstrual dysphoric syndrome, postnatal depression or climacteric syndrome depending on the reproductive stage[16].

Use of hormone therapy (HT) during the climacteric stage was also related to a slightly higher risk for a MRS total score ≥ 17 (OR 1.25; 95% CI 1.06–1.49). This result must be analyzed, as only 33% of the climacteric women interviewed were current HT users during this study. Further, to enter HT as a categorical variable, different types of HT cited by users were not distinguished and grouped for comparison with non-users. A future differential analysis of HT alternatives and their specific effects on the MRS total scores would be valuable.

To a lesser degree, the sociodemographic factors that influenced the MRS total ≥ 17 in this sample were single relationship status (OR 1.78; 95% CI 1.47–2.15), rural habitat (OR 1.70; 95% CI 1.47–1.96), unemployment (OR 1.38; 95% CI 1.16–1.63) and education <12 years (OR 1.35; 95% CI 1.16–1.63). Being married or living with a partner is the most common marital status in Mexico, where traditional family values are important and the role of mother is considered valuable. Bearing this in mind, negative cultural beliefs concerning being single during the mid-life years may influence symptom perception and experience. This hypothesis should be tested in a future study. Living in a rural area, unemployment and an education level under 12 years are all indirect indicators of an underprivileged socioeconomic status. Even though they were not relevant predictors of a more severe symptom total score, these results indicate the need for a more intense educational effort on menopause, primarily in rural areas of the country to promote better understanding, symptom prevention and attention to women's health during this life stage. Factors that have been previously related to MRS symptoms in other countries, such as ethnicity, body mass index, living at high altitude and weather conditions[1] will be further explored in subsequent studies. Notably, women living in the warmer, low-altitude Mexican region of the South, which also primarily has a rural, poor and indigenous population, had the highest total MRS mean score and the youngest age at natural menopause. This observation should be studied in more depth as a future independent study in the ENACLIM series.

CONCLUSIONS

The mean age for natural menopause in the Mexican women included in this nationwide sample was 47.9 years, which is slightly lower than previously reported by researchers whose results were based on smaller and partial samples of the Mexican population.

The menopausal symptoms included in the MRS were more severe in women during the last transitional stage, which is characterized by more than two absent cycles, and in women who had undergone a bilateral oophorectomy. Regional differences were observed for the severity and prevalence of specific MRS symptoms, but no significant regional differences were observed for the mean age at natural menopause.

To our knowledge, the 2010–2011 ENACLIM-AMEC Survey is the first national effort to explore the general sociodemographic, health and risk profile for Mexican women who consult gynecologists during mid-life with a specific focus on the climacteric transition. The results reported in this study are the first step toward the construction of a reliable database from a nationwide sample of Mexican women that may support the clinical practice of health specialists who work with mid-life women in this country.

ACKNOWLEDGEMENTS

Preliminary results from the 2010–2011 ENACLIM-AMEC Survey were presented during the 13th World Congress on Menopause, 8–11 June, 2011 in Rome. All researchers worked *pro bono*. We thank Ms Itzel Sanchez, the Office Manager of the AMEC, for her assistance during this study.

Conflict of interest The authors report no conflict of interest. The authors alone are responsible for the content and writing of this paper.

Source of funding This study was financed exclusively by the members of the Research Committee of the Mexican Association for the Study of the Climacteric listed as authors.

All authors and researchers worked *pro bono*. Reproduction and delivery of survey materials to researchers were financed by the Research Committee of the Mexican Association for the Study of the Climacteric (AMEC), which is a non-profit organization.

APPENDIX: ENACLIM-AMEC 2010–2011 Research Team

Jorge Casellas, Gynecology and Obstetrics Association, Ciudad Obregon; Luzmila Delgadillo, Gynecology and Obstetrics Association, Cd. Juarez; Agustin Escobar, Women and Children's Hospital, Tijuana; Juan de Dios Maldonado, Private practice, Monterrey; José de Jesús Montoya, Gynecology and Obstetrics Mexican Federation, Mazatlan; Rosa del Carmen Ochoa, Chiapas Health Institute, Tuxtla Gutierrez; Gumercindo G. Vázquez, Star Medica Hospital, Merida; Alfonso Jesús Zarain, Climacteric and Osteoporosis Clinic, Puebla; Alberto Alvarado G., Vice President of AMEC, Mexico City; Héctor M. Alvarez, Private practice, Morelia; Armando Montaño, General Hospital, Climacteric Clinic, Mexico City; Jorge L. Arzate, Private practice, Colima; Armando E. Carrera; Gynecology and Obstetrics Association, Tlaxcala; Manuel Chable, ISSEMYM Hospital, Toluca; Carlos Diaz, IMSS and ISSSTE Hospitals, La Paz; Gabriel Gallo, Private practice, Mexico City; Ma. Dolores Martinez, Autonomous University of the State of Mexico, Toluca; Ma. Lourdes Morato, ABC Hospital, Campus Santa Fe, Mexico City; Alfonso Murillo, Angeles Lomas Hospital, Huixquilucan; Marco A. Muhlia, Private practice, Toluca; Rocío Ortiz, Private Practice, Guadalajara; Imelda Hernández, Hospital Juárez, Mexico City; Daniel Rivera, Gynecology and Obstetrics Association, Ciudad Obregon; Miguel Angel Salceda, CAPPS Climacteric Clinic, Hermosillo; Jorge Rojas, General Hospital, Mexicali; Patricia Samano, ISSEMYM Hospital, Toluca; Fernando Sánchez, Angeles Hospital, Mexico City; J. Roberto Silvestri, National Institute of Perinatology Isidro espinoza de los Reyes, Mexico City; J. Porfirio Soto, Private practice, Acaponeta; José P. Topete, Private practice, Toluca; Alejandro Vázquez A., Clinic for Woman's Integral Medical Attention, AC, Naucalpan de Juárez; Carlos Salinas, Angeles Hospital, Puebla; J. Alberto Hernández-Bueno, Clinic for Woman's Integral Medical Attention, AC, Naucalpan de Juárez; Rosa E. Caballero, Gynecology and Obstetrics Association, Ciudad Obregon; Raquel del R. Ahumada, General Hospital, San Felipe del Progreso; Paloma Acevedo, Private practice, Cancun; Luz Ma. Bravo, Private Practice, Guadalajara.

References

1. Chedraui P, Blümel JE, Baron G, *et al*. Impaired quality of life among middle aged women: a multicentre Latin American study. *Maturitas* 2008;61:323–9
2. Blümel JE, Chedraui P, Baron G, *et al*. A large multinational study of vasomotor symptoms: prevalence, duration, and impact on quality of life in middle-aged women. *Menopause* 2011;18:778–85
3. Castelo-Branco C, Blümel JE, Chedraui P, *et al*. Age at menopause in Latin America. *Menopause* 2006;13:706–12
4. Vladislavovna-Doubova S, Pérez-Cuevas R, Reyes-Morales H. [Self-rated health among climacteric women affiliated with the Instituto Mexicano del Seguro Social]. *Salud Pública Mex* 2008;50:390–6
5. Murillo A, Carranza-Lira S, Martínez-Trejo N, Santos JE. [Epidemiologic variables of postmenopausal women]. *Ginecol Obstet Mex* 1999;67:478–83
6. Malacara JM, Canto de Cetina T, Bassol S, González N, Cacique L, Vera-Ramírez ML. Symptoms at pre- and postmenopause in rural and urban women from three States of Mexico. *Maturitas* 2002;43:11–19
7. Carranza-Lira S, Flores-Miranda MA, Gómez-Brigada I. [Comparison of climacteric syndrome symptoms among perimenopausal women from Mexico City and one Zapotec community of Oaxaca, Mexico]. *Ginecol Obstet Mex* 2010;78:116–20
8. Bassol-Mayagoitia S. [Menopausal age in Mexico]. *Endocr Nutr* 2006;14:133–6
9. Ojeda E, Monterrosa A, Blümel JE, Escobar-López J, Chedraui P. Severe menopausal symptoms in mid-aged Latin American women can be related to their indigenous ethnic component. *Climacteric* 2011;14:157–63
10. INEGI-México. *Censo Nacional de Población 2010* (National Population Census 2010). Available at: http://www.censo2010.org.mx/
11. Instituto Nacional de Salud Pública. *Encuesta Nacional de Salud 2006*. DF, Mexico: INSP, 2007
12. INEGI-México. *Censo Nacional de Población 2005* (National Population Census 2005). Available at: http://www.inegi.org.mx/
13. Heinemann K, Potthoff P, Schneider HP. International versions of the Menopause Rating Scale (MRS) scale. *Health Qual Life Outcomes* 2003;1:28
14. Chedraui P, Aguirre W, Hidalgo I, Fayad I. Assessing menopausal symptoms among healthy middle aged women with the Menopause Rating Scale. *Maturitas* 2007;57:271–8
15. Ward T, Scheid V, Tuffrey V. Women's mid-life health experiences in urban UK: an international comparison. *Climacteric* 2010;13:278–88
16. Flores-Ramos M. [Women's reproductive related disorders: a new proposal for the mental health field]. *Gac Med Mex* 2011;147:33–7

Supplementary material available online

Table S1 to be found online at http://www.informahealthcare.com/doi/cmt/10.3109/13697137.2012.696288