Maturitas 74 (2013) 346–351

Contents lists available at SciVerse ScienceDirect

Maturitas

journal homepage: www.elsevier.com/locate/maturitas

Prevalence of insomnia and related factors in a large mid-aged female Colombian sample

Alvaro Monterrosa-Castro[a], Martha Marrugo-Flórez[b], Ivette Romero-Pérez[c], Peter Chedraui[d], Ana M. Fernández-Alonso[e], Faustino R. Pérez-López[f,*]

[a] Department of Obstetrics and Gynecology, Facultad de Medicina, Universidad de Cartagena, Grupo de Investigación Salud de la Mujer, Cartagena, Colombia
[b] Grupo de Investigación Salud de la Mujer, Barranquilla, Colombia
[c] Grupo de Investigación Salud de la Mujer, Cali, Colombia
[d] Institute of Biomedicine, Facultad de Ciencias Médicas, Universidad Católica de Guayaquil, Guayaquil, Ecuador
[e] Department of Obstetrics and Gynecology, Hospital Torrecárdenas, Almería, Spain
[f] Department of Obstetrics and Gynecology, Facultad de Medicina, Universidad de Zaragoza, Hospital Clínico Lozano Blesa, Zaragoza, Spain

ARTICLE INFO

Article history:
Received 14 November 2012
Received in revised form 3 January 2013
Accepted 7 January 2013

Keywords:
Athens Insomnia Scale
Sleep
Insomnia
Menopause Rating Scale
Colombia
Ethnics

ABSTRACT

Objective: To assess the prevalence of insomnia and related factors in a large cohort of mid-aged Colombian women of different ethnical background.
Methods: This cross-sectional study involved 1325 women aged 40–59 of 3 ethnical groups: Mestizo (70.0%), Black (11.5%) and Zenú indigenous (18.5%), who completed the items of the Athens Insomnia Scale (AIS), the Menopause Rating Scale (MRS) and a general questionnaire containing personal socio-demographic data.
Results: Median [interquartile range] age of the whole sample was 48.0 [10.0] years. A 43.4% were postmenopausal, 51.7% had increased body mass index values, 18.2% had hypertension and 5.1% used hormone therapy. A 27.5% displayed insomnia (AIS total score ≥6). Significant Spearman rho correlations were found between total AIS and MRS scores (total and subscales). Multiple linear regression analysis found that higher total AIS scores (more insomnia) correlated with tobacco consumption and higher MRS psychological and somatic subscale scores (more severe symptoms). Age, ethnicity and partner and menopausal status were excluded from the final regression model.
Conclusions: In this large mid-aged Colombian cohort insomnia was present in nearly one third of cases, related to smoking habit and the severity of somatic and psychological menopausal symptoms and independent of ethnics and menopausal status.

1. Introduction

Low quality of sleep and insomnia are frequent during the menopausal transition [1–5]. Independent of objective sleep assessment [6], insomnia has been defined as a subjective alteration associated to the onset or maintenance of sleep [7–9]. Insomnia may lead to other problems such as daytime sleepiness, work difficulties, memory reduction, risk of accidents, mood changes, increased cardiovascular risk and a state of chronic inflammation [3,10–15].

Prevalence of insomnia may vary considerably in accordance to definition criteria, research study design and methodology [2,3,5,16]. It is more prevalent in women than in men and related to health disorders and demographical, behavioral, and cultural aspects [2,16–18]. Rate may vary from 9 to 56.6% among mid-aged women [2–6,17,19–21]. The influence of ethnics over sleep performance has been studied among mid-aged US Caucasian, Black and immigrant women from different world regions [22,23]. Hispanic immigrant is a heterogeneous denomination for different ethnical backgrounds which have in common the Spanish language. Sleep, ethnics and the menopause have been analyzed among Hispanic immigrant women, with limited information regarding insomnia available from mid-aged Hispanic women living in their original cultural and traditional lifestyle [3,5,19,22,23]. Thus, the aim of the present research was to assess the prevalence of insomnia and related risk factors in a large cohort of mid-aged Colombian women of different ethnical background using the Athens Insomnia Scale (AIS).

* Corresponding author at: Department of Obstetrics and Gynecology, University of Zaragoza Hospital Clínico Lozano Blesa, Domingo Miral s/n, Zaragoza 50009, Spain. Tel.: +34 976 312 836; fax: +34 976 761 735.
E-mail addresses: faustino.perez@unizar.es, gineblog@hotmail.com (F.R. Pérez-López).

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http://dx.doi.org/10.1016/j.maturitas.2013.01.009

2. Methods

2.1. Study design and participants

A cross-sectional study was carried out from February 2009 to March 2011 among Colombian women aged 40–59 years who were requested to fill out the AIS, the Menopause Rating Scale (MRS) and a questionnaire containing personal data. Women were either mestizo (also called Hispanic), indigenous (direct descendants of native Zenú) or black (direct African descendants). Mestizo women were recruited from urban and surrounding peripheral areas (Barranquilla and Cartagena in the Atlantic coast and Cali in the Pacific coast) and from rural regions of the Colombian departments of Bolivar (North) and Valle del Cauca (South). Afro-descendant participants (mother and father black) are natural residents of the Municipio of San Cayetano and nearby areas (Municipio de San Juan Nepomuceno) in the Department of Bolivar, Cartagena, Colombia. San Cayetano Municipio is a small partially isolated village, which is populated by approximately 4000 low-income black individuals who are direct descendents of African slaves who settled in the area during the colonial days. Indigenous Zenú women were from the San Andrés de Sotavento fortress. This fortress was created by the Spanish crown in 1773 and is located on the North Colombian coast (Department of Córdoba). This low socioeconomic population is an ancestral settlement of native indigenous individuals who have not blended with any other race. They are devoted to basic agriculture chores and the manufacturing of textiles and baskets. Despite the fact that all participants are from various Colombian sites and ethnicities they all share a common language and Hispanic cultural background.

Door-to-door visits were carried out by trained personnel in the cited communities, seeking women meeting the inclusion criteria. Women were informed about the research (purpose and content) and requested to give written consent of participation. Those denying participation, had surgery in the last 6 months, cancer or any other serious illness, did not complete the socio-demographic questionnaire or were incapable of understanding its content were excluded.

The study protocol of this research was approved by the institutional review board of the Cartagena University, Cartagena, Colombia and was carried out in accordance with the principles of the Declaration of Helsinki.

2.2. Survey

Personal data of the questionnaire included age, parity, ethnicity, menopausal and marital and partner status, body mass index (BMI), current use of hormone therapy (HT), educational level, habits (current coffee and tobacco consumption) and the presence of hypertension. Menopause status was defined using criteria of the Stages of Reproductive Aging Workshop: premenopausal (women having regular menses), perimenopausal (irregularities >7 days from their normal cycle), and postmenopausal (no menses in the last 12 months) [24]. Those with bilateral oophorectomy were considered postmenopausal.

BMI was calculated as weight in kilograms divided by squared height in meters. BMI values were categorized as low ($<18.50\,kg/m^2$), normal ($18.50–24.99\,kg/m^2$), or increased ($\geq 25.00\,kg/m^2$). Increased BMI values were further used to define women as being overweight ($25.00–29.99\,kg/m^2$) or obese (≥ 30.00) [25]. Women declaring to be on anti-hypertensive medication were considered as hypertense [26].

2.3. The Athens Insomnia Scale (AIS)

The AIS is a self-administered psychometric instrument designed for the quantification of sleep difficulties [27,28] based on the International Classification of Diseases (ICD-10) [7]. It consists of eight items: the first four pertain to sleep quantitative variables, including sleep induction, night awakenings, early morning awakenings, and total sleep duration. The fifth item relates to overall sleep quality, and the last three refer to the impact of insomnia over day time performance. Items can be rated from 0 (no problem) to 3 (very serious problem) with higher scores denoting more impaired sleep or insomnia. Total AIS scores (sum of all rated items) may range from 0 to 24 with totals scores of 6 or more used to define insomnia [27,28]. The present research used the Spanish language validated AIS [29,30].

2.4. The Menopause Rating Scale

The MRS assesses the presence and severity of menopausal symptoms through 11 items grouped into three subscales: somatic (4 items), psychological (4 items) and urogenital (3 items). Women may grade each item from 0 (not present) to 4 (1 = mild; 2 = moderate; 3 = severe; 4 = very severe). Graded items within each subscale are summed up to provide a total subscale score. The sum of each obtained subscale score provides a total MRS score. Total MRS scores equal to or above 17 were defined as severe (severe menopausal symptoms) [31,32].

2.5. Sample size calculation

A minimal sample size of 1037 participants was calculated assuming a 50% prevalence of insomnia [3,5,19] with a 4% desired precision and a 99% confidence level.

2.6. Statistical analysis

Statistical analysis was performed using the SPSS version 19 (IBM, Armonk, NY, USA). Data are presented as medians, interquartile ranges (IQR), percentiles (25–75), means, standard deviations, percentages, β-coefficients and confidence intervals. Internal consistency of the instruments (AIS and MRS) was assessed by computing Cronbach's alpha coefficient values.

The Kolmogorov–Smirnov test was used to determine the normality of data distribution. According to this, non-parametric continuous data were compared using the Mann–Whitney *U* test (two independent samples) or the Kruskal–Wallis test (various independent samples). ANOVA was used to compare parametric data (various independent samples) and the chi-square test used to compare percentages. Spearman Rho coefficients were calculated to determine correlations between total AIS scores and various numeric variables (bivariate analysis).

Multiple linear regression analysis was performed to assess variables related to higher total AIS scores and, therefore, insomnia. The dependent variable was the total AIS score. The model was constructed from independent variables achieving $p \leq 0.10$ during bivariate analysis. Independent variables tested during bivariate analysis included: age, parity, menopause status, race/ethnicity, MRS subscale values, BMI, smoking habit, coffee consumption, educational level, HT use, and partner status (no/yes). Entry of variables into the model was performed using a backward/forward stepwise procedure. A p value less than 0.05 was considered statistically significant.

3. Results

During the study period, a total of 1412 women were asked to participate, 0.06% provided incomplete data, leaving 1325 surveys for final analysis. For the whole sample median [IQR] age and educational level was 48 [10] and 11 [6] years, respectively. The majority of women were mestizo (70.0%), 67.4% consumed coffee,