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Perceived control over menopausal hot flushes in mid-aged women

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Abstract

Background. Hot flushes (HFs) and night sweats are frequent complaints among both peri- and postmenopausal women. Perceived control of this complaint may vary from one population to another.
Objective. To assess perceived control over menopausal HFs and determinant factors among mid-aged Ecuadorian women.
Methods. In this cross-sectional study healthy women aged 40–59 years, seeking healthcare centres of eight main cities of Ecuador with more than 100,000 inhabitants, were assessed with the Menopause Rating Scale (MRS) and those presenting HFs were requested to fill out the Perceived Control Index (PCI) and a questionnaire containing socio-demographic data (female and partner).
Results. A total of 1154 women participated in this study of which 56% presented HFs ($n = 646$). According to the MRS, 29.1% and 9.1% of these HFs were graded as severe and very severe, respectively. Mean age of women presenting HFs was 49.5 ± 5.2 years, with 51.9% having 12 years or less of education, 61.5% being postmenopausal and 47.2% living in high altitude. At the moment of the survey 13.9% were on hormone therapy, 12.8% on phytoestrogens and 7.1% on psychotropic drugs. There was a significant decreasing trend for PCI scores (total and difficulty in control items) from one menopausal stage to the next, with no differences observed for time since menopause onset. Despite this, logistic regression analysis determined that HF severity, as determined with the MRS, was the only single predictive factor related to lower HF perceived control (total PCI score < 38) (OR: 1.83 CI 95% [1.15–2.90], $p < 0.01$).
Conclusion. As determined with the PCI, HF severity was related to a lower perceived control among mid-aged women.

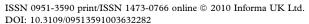**Keywords:** *Hot flushes, severity, Perceived Control Index, Ecuador, menopause, climacteric*

Introduction

Hot flushes (HFs) and/or sweats are among the most frequent symptoms present during both peri- and postmenopausal women. Several factors have been related to the presence and intensity of HFs: reproductive history, the environment, exercise, body mass, stress, ethnics, culture and education [1–7]. Young women may encounter flushes that do not usually last long, with feelings of cold and heat alternating over the course of as short as a few seconds. These flushes tend to occur mainly just before or during menstruation. Vasomotor symptoms gradually occur between ages 45 and 55, but may also occur later in the postmenopausal phase. These

complaints may alter their psychological status, and have been associated to depressive symptoms, sleep disorders and other diseases – including osteoporosis, cardiovascular disease – although night sweats at the menopause were associated to reduced risk of death over the following years [8–14].

Personal well being and satisfaction during the menopause are related to social support and life events. Different studies suggest that stress and HFs are correlated, and that HFs are more severe in women with lower coping capacities [15]. However, self-perceptions, ethno-cultural variables, psychosocial factors and personal health status may be more important predictors of HF coping capacity than severity itself [16–19]. Thus, control over HFs and

quality of life may vary from one population to another, although data are limited. Reynolds [20,21] has proposed the use of the Perceived Control Index (PCI) tool that assesses women's control over HFs. The present investigation aimed to assess perceived control over menopausal HFs and determinant factors in a mid-aged Ecuadorian population using the PCI.

Methods

Participants

From 15 February to 15 June 2009, a cross-sectional study aimed to assess the risk factors for the presence and severity of HFs (The National Ecuadorian Study regarding HFs) among mid-aged women that was carried out in eight main cities of Ecuador with more than 100,000 inhabitants [7]. For this, healthy women aged 40–59 years seeking healthcare or accompanying patients to centres were requested to fill out a general questionnaire containing personal and partner data. Subjects were additionally assessed for HF presence and severity using the Menopause Rating Scale (MRS, item 1). Women excluded from the study were those refusing participation or were incapable of understanding the items included in the questionnaire.

The study had two secondary aims to be carried out among women presenting HFs: *the first* to assess beliefs regarding HFs and *the second* perceived HF control. In order to fulfil the latter aim women were additionally requested to fill out the PCI. The present document only provides information of those who presented HFs and filled out the PCI. Findings of the National Ecuadorian Study (Primary Research Branch) are presented elsewhere [7]. Research protocol (Primary and secondary branches) of the study was reviewed and approved by the Bioethics Committee of the Medical Faculty of the Universidad Católica, Guayaquil, Ecuador. All participants were informed about the research and its purposes and written consent obtained.

Sample size calculation was focused on the aim of the Primary Branch of the study: determining risk factors for HF presence and severity. Hence, using EPI-INFO 6.04 statistical software a minimal sample of 94 women per centre was calculated, considering that each one covers an estimated population of 5000 women between 40 and 59 years and assuming that, as previously reported [22,23] at least 50% would present HFs with a 10% acceptable error and a 95% confidence interval.

Variables included in the questionnaire

Female. Female data included: age (years), parity, menopausal status (pre-, peri- or postmenopausal),

marital status, educational level (in years), accessed health system (free or paid), smoking status (non-smoker, current, sometime), partner status, church attendance, geographical altitude location, history of sexual abuse, psychiatric consultation, and the use of drugs (psychotropic, hormone therapy [HT] or phytoestrogens). High altitude was considered if women lived 2000 m or more above sea level. Women were asked about how they perceived their health status and that of their partners. Those (men or women) capable of performing daily routine activities were defined as healthy. Sedentarism was considered if subjects carried out less than 15 min of physical activity twice a week [24].

Partner. Partner data were provided by women and included: age (years), educational level (total years), healthiness, faithfulness, presence of alcoholism and sexual dysfunction (erectile dysfunction or premature ejaculation). Alcoholism was defined as a behavioural disorder manifested by repeated and excessive alcohol consumption that interferes with health and economic or social relationships. Criteria used to define male sexual dysfunction (erectile and ejaculatory) has been previously reported [23,25]. For surveyed women and their partners 12 or less years of schooling was considered as low [26].

Assessment instruments

The Menopause Rating Scale (MRS): hot flush assessment. This instrument was used to assess HF presence and severity. The MRS is a menopause specific health-related quality of life instrument composed of 11 items divided into three subscales: somatic, psychological and urogenital. For the purpose of this research item one of the somatic sub-scale was used, which was graded by the subject from 0 (not present) to 4 (1 = mild; 2 = moderate; 3 = severe; 4 = very severe) [27].

Perceived Control Index: hot flush perceived control assessment. The PCI tool was developed by Reynolds [20,28] as an adaptation from the standardised Arthritis Helplessness Index (AHI) [29]. The tool includes 15 items which were reworded to refer to menopausal HFs, with nine items referring to positive control over flushing and six referring to difficulties in control. Participants rate the extent to which they agree with each statement on a 4-point Likert scale ('strongly disagree' to 'strongly agree'). Scoring was reversed for those items referring to difficulties in control so that higher scores reflect greater perceived control. A total score is obtained by summing all responses and may range from 15 to 60, with higher scores indicating greater perceived control. Additionally, a total score for positive control items and difficulty control items is presented.

For the purpose of this research, a Spanish translation of the PCI instrument was validated among 50 women before delivery to all participating centres.

Menopausal status definition

The following definitions were used: premenopausal, women having regular menses; perimenopausal, those presenting irregularities >7 days from their normal cycle and postmenopausal, no more menses in the last 12 months [30]. Those with bilateral oophorectomy were considered as postmenopausal. For statistical purposes, hysterectomised women were considered as a separate group.

Statistical analysis

Analysis was performed using EPI-INFO 2000 statistical package (Centers for Disease Control, Atlanta, Ga., USA; World Health Organization, Geneva, Switzerland). Data are presented as means, standard deviations, medians, percentages, odds ratios (OR) and confidence intervals. Group comparison of continuous data was performed with ANOVA. Logistic regression was used to analyse factors related to lower perceived control over HFs. For this, PCI total score, as a continuous variable, was transformed into a categorical variable, now considered as cases (lower HF control) those achieving total PCI scores <38 (median). Independent variables to be considered in the logistic regression model related to surveyed women were: older age ($\geq$49, median), higher parity ($\geq$3, median), marital status (married or not), low schooling ($\leq$12 years), postmenopausal status, high-altitude residency ($\geq$2000 m over sea level), smoking habit, sedentary lifestyle, health status, access to free health care, drug use (HT, phytoestrogen and/or psychotropic), partner status and if currently receiving psychiatric consultation. Those related to the partner were: age, low schooling, alcoholism, healthiness, faithfulness and sexual dysfunction (premature ejaculation or erectile dysfunction). Entry of variables (female and partner) into the model was considered with a 20% significance level and the back stepwise procedure performed. A p value of <0.05 was considered as statistically significant.

Results

During the study period 1154 women were surveyed at a total of 11 centres from the Ecuadorian coast and highlands. Of the whole cohort, 56% ($n = 646$) presented HFs, which were graded, according to the MRS, in 29.1% and 9.1% as severe and very severe, respectively. Mean age of women presenting HFs was 49.5 $\pm$ 5.2 years (median 49), with an average parity of 3.2 (median 3). General characteristics of women with HFs and their partners are outlined on Table I. Among the main findings were: 51.9% had 12 years or less of education, 61.5 were postmenopausal, 47.2% lived in high altitude, 55.3% were married and 83.1% currently had a partner. A 13.9% were on HT, 12.8% on phytoestrogens and 7.1% on psychotropic drugs. In addition, a 68.1% of them accessed to a free healthcare system, 10.7% were smokers, 43.2% were sedentary and 73.5% reported a positive perception of their health status. As for the partner ($n = 537$), average age was 52.1 $\pm$ 7.2 years (median 52), 43.9% had low schooling, 19.6% abused alcohol and 45.4% had sexual dysfunction (erectile dysfunction: 21.8% and premature ejaculation: 23.6%). According to surveyed women, 68.5% considered their partners as healthy and 51.4% as faithful.

Depicted in Table II, one can observe the obtained scores for the PCI (total and for positive and difficulty in control questions) for all women and according to the menopausal phase and years since menopause onset. There was a significant decreasing trend for PCI scores (total and difficulty in control items) from one menopausal stage to the next, with no differences observed for time since menopause onset. Despite this, logistic regression analysis determined that HF severity, as determined with

Table I. Characteristics of surveyed women ($n = 646$) and their partners ($n = 537$).

	n (%)
Female	
Living in high altitude ($\geq$2000 m over sea level)	305 (47.2)
Married*	357 (55.3)
Premenopausal	100 (15.5)
Perimenopausal	149 (23.1)
Postmenopausal	397 (61.5)
Bilateral oophorectomy	73 (11.3)
Histerectomised	134 (20.7)
Low schooling ($\leq$12 years)	335 (51.9)
Current smoker	656 (10.1)
Sedentary	279 (43.2)
Access to free health care	440 (68.1)
HT use	90 (13.9)
Phytoestrogen use	83 (12.8)
Psychotropic use	46 (7.1)
Psychiatric consultation	79 (12.2)
History of sexual abuse	41 (6.3)
Currently has a partner	537 (83.1)
Healthiness (perceived health status)	475 (73.5)
Church assistance	377 (58.4)
Partner	
Low schooling ($\leq$12 years)	236 (43.9)
Alcoholism	105 (19.6)
Healthy	368 (68.5)
Erectile dysfunction	117 (21.8)
Premature ejaculation	127 (23.6)
Faithful	276 (51.4)

*Those not married were either single (7.0%), divorced (10.2%), widowed (7.1%) or cohabited with partner (20.4%)

Table II. Total scores for the PCI among women with HFs: all and according to menopausal status and years after menopause onset.

Parameter	Total PCI score (mean)	Positive control items	Difficulties in control items
All ($n = 646$)	37.9 ± 5.8	24.0 ± 4.6	13.9 ± 2.9
Menopausal phase			
Premenopausal ($n = 100$)	39.2 ± 4.9	24.7 ± 4.9	14.6 ± 3.1
Perimenopausal ($n = 149$)	37.6 ± 5.1	24.0 ± 4.2	13.6 ± 2.5
Postmenopausal ($n = 397$)	$37.7 \pm 6.1^*$	23.8 ± 4.7	$13.9 \pm 2.9^*$
Postmenopausal stage			
Early (<5 years) ($n = 215$)	37.9 ± 6.1	24.0 ± 4.7	13.9 ± 3.0
Late (≥ 5 years) ($n = 182$)	37.5 ± 6.2	23.6 ± 4.7	13.9 ± 2.8

$^*p < 0.05$ for the whole trend.

the MRS, was the only single predictive factor related to lower HF perceived control (total PCI score <38) (OR 1.83 CI 95% [1.15–2.90], $p < 0.01$).

Discussion

HFs are among the most typical and frequent complaints associated to ovarian insufficiency and the menopausal transition. Close and complex relationships exist between night sweats, sleeping disorders/sleepiness, focusing difficulties and mood swings. HF initiation is unpredictable, although it may be triggered by stressful events, and is suffered with embarrassment and distress due to the negative social issues involved. Coping mechanisms are effective for mild HFs, but when symptoms are frequent and intense it may cause anxiety, fatigue, sleepiness and mood changes. Although several tests and quality of life scales have been designed to measure HF intensity and their emotional consequences, cultural, ethnic, socioeconomic factors and other aspects may influence coping to HFs. Vasomotor symptoms consistently cluster separately from psychological and psychosomatic symptoms [31].

Data regarding perceived control over menopausal HFs are scarce, and studied populations have included small samples of women [20,21]. Bearing this in mind, the present series used Reynolds' PCI which is derived from the AHI self-report instrument described initially to measure perceptions of loss of control in patients with rheumatoid arthritis (RA) [29]. The AHI showed greater helplessness associated to greater age, less education, low self-esteem, anxiety, depression and impairment to carry out usual daily activities. In RA, depression and mood changes may confound self-reports of pain and global status, but it seems to have minimal influence on reported functional disability [32]. Therefore, the AHI was considered to be a reliable tool to measure helplessness in RA. Reynolds [20,21] adapted and reworded the AHI to evaluate the self-reported distress, expecting to determine the perceived control and coping capacity during HFs instead of frequency or intensity since subjective factors may enhance or reduce how each woman suffers HFs. In the original

description those women with higher PCI scores experienced significantly less distress during HFs. Despite this, some caution is needed when questionnaires are used to evaluate biological processes [33]. Symptoms become manageable when women engage in a healthy lifestyle and have social support of family and friends.

The present series aimed to measure perceived control over HFs with Reynolds' validated tool, the PCI, in its Spanish version. Although PCI scores (total and difficulty in control items) significantly decreased from one menopausal stage to the next, our logistic regression model in fact determined that HF severity was the only single predictor of lower PCI scores (lower perceived control). Despite the fact that several described factors may indeed influence coping to HFs, intensity, as found in the present series, seems to be an important one and hence treating HFs becomes an important issue. Our results point out the usefulness of combining the PCI with the MRS in the assessment of women presenting with HFs.

Finally, as for the limitations of this study one can mention its cross-sectional design and not determining female body mass index. Increased weight has been determined as a predictor of HF intensity [34]. Hence to have correlated body mass index with HF intensity and PCI scores, would have rendered interesting information. Despite these limitations one must mention an important strength which is the fact that the number of women included in the present series was far greater than that studied in Reynolds' original reports [20,21], and therefore to best of our knowledge this series may indeed be the largest ever reported using the PCI.

In conclusion, as determined with the PCI, HF severity was related to a lower perceived control among mid-aged women; more research is warranted especially in terms of using the PCI tool in combination with the MRS after clinical intervention.

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