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## Influence of psycho-social factors on climacteric symptoms

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### Abstract

**Background:** It has been suggested that psycho-social factors may be crucial in the development of climacteric symptoms. **Material and methods:** In order to evaluate the effect of psycho-social and biological factors on menopausal symptoms, Greene (climacteric symptoms), Cooper (psychosomatic symptoms of stress), Smilkstein (family dysfunction), Duke-UNC (social support) and Israel (life events) tests were passed to 300 Chilean women between 40 and 59 years of age. Data were evaluated with ANOVA,  $\chi^2$  and logistic regression using the Epi-info package. **Results:** Perimenopausal women had a significant increase in stress and climacteric symptoms; however comparing with pre and postmenopausal women, tests for life events, family dysfunction or social support did not show any differences. A history of premenstrual syndrome was the main risk predictor for climacteric symptoms (OR: 3.6, IC: 1.5–8.5;  $P < 0.03$ ), followed by perimenopausal state (OR: 2.9, IC: 1.4–6.0;  $P < 0.001$ ) and negative life events (OR: 2.3, IC: 1.0–5.3;  $P < 0.05$ ). The psycho-social factors were predictors for anxiety and depression; on the other hand, perimenopausal state was a risk factor for somatic and vasomotor symptoms. During premenopause, women with regular cycles and vasomotor symptoms have more psychological symptoms and stress. **Conclusion:** Climacteric symptoms that appear in the perimenopause are more intense in those women who have a biological predisposition such as premenstrual syndrome and are modulated by psycho-social factors.

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**Keywords:** Psycho-social factors; Climacteric symptoms; Influence

### 1. Introduction

For many women the cease of menstruations can seem an advantage, but in others this event is believed as the beginning of a deterioration process that affects

their quality of life [1]. Thus, do the psychological and physical symptoms that appears during climacteric have their origin in the decline of the ovarian function or are they consequence of social and behavioural factors? Many studies have suggested that psycho-social, behavioural and general health factors are more significant for the quality of life perception in the climacteric period than the menopause itself [2–6]. In this

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sense, Dennerstein in a well-designed study shown that the well-being of middle-age women was more related to their current health status, psychosocial and lifestyles rather than to menopausal status [3]. Moreover, only vasomotor symptoms has been related to menopausal status; negative mood and reduced sexual interest is better explained by the presence of vasomotor symptoms and by reproductive health and lifestyle variables such as current or previous premenstrual syndrome, dysmenorrhea, smoking and lack of exercise [4]. Other authors have suggested that physical activity and exercise are related to lower prevalence of climacteric symptoms and that the minor schooling the major prevalence of vasomotor symptoms [5,6]. Zichella et al. pointed out the role of healthy lifestyles in the quality of life of climacteric woman [2].

Opposite to these previous studies, we showed earlier that menopause cause a lack of well-being not related to age or other socio-demographic factors [7]. Since the influence of socio-cultural factors in the lack of quality of life could not be discarded in menopausal women we designed the present study to analyze the effect of biological and socio-cultural factors on climacteric symptoms.

## 2. Material and methods

### 2.1. Subjects

The sample was taken from women aging between 40 and 59 years old, who attend the Medical Centre “Carol Urzúa” of the Eastern Metropolitan Health Service in Santiago de Chile, covering an estimated population of 3987 women in 2001 according to the data provided by the Statistical Unit of the Patient Program Department of the East Metropolitan Health Service. Using an statistical software (Epi-info version 6.04) to calculate sample size, for a population size of 3.987 women and an expected frequency of symptoms of minimum 30% (8), a sample size of 299 was selected based on the results of a power analysis. Therefore, a total of 306 women were asked to be interviewed in private by medical students between January and February of 2002 in an office of the Carol Urzúa Medical Center (Service of Health South Subway). Of them, six declined to participate in the interview (refusal rate of 2%). The inclusion criteria were: healthy women

accompanying patients who went to Carol Urzúa Medical Center whose ages were between 40 and 59 years. Exclusion criteria included: HRT and hormonal contraceptives users and women with difficulty to understand the survey. Additionally, women with hysterectomy and/or oophorectomy were also excluded, since the study was focused on the menopause as a natural and biological process that occurs in women mild-life.

### 2.2. Design of the study

In this study, middle-aged women were evaluated for as given further.

*Climacteric symptoms:* were self-evaluated in function of their intensity ((1) minor, (2) moderate and (3) severe) using the Greene scale validated in Spanish (scale reliability coefficient: 0.8321) (21 questions grouped in to 5 dominions: anxiety, depression, somatic and vasomotor symptoms and sexuality) [9,10].

*Psycho-social factors:* with the Cooper Questionnaire [11,12] to assess psychosomatic symptoms of stress (22 questions with scores from 0 to 44), the Smilkstein’s Family Apgar Test [13,14] for family dysfunction (5 items), the Duke-UNC Questionnaire [15,16] to evaluate social support (11 questions) and finally, life events were assessed by the Vital Events Scale, a questionnaire adapted from a battery developed by Israel [17] including 13 items. All these tests have been validated in Spanish (Cooper’s Scale reliability coefficient: 0.9036, Smilkstein’s Family Apgar Test reliability coefficient: 0.7076, Duke-UNC Questionnaire reliability coefficient: 0.8756, Vital Events Scale reliability coefficient: 0.6687) [10,12,14,16].

*Reproductive health:* to define the status of reproductive age: premenopause (regular menses), perimenopause (irregularities > 7 days from their normal cycle) and postmenopause (amenorrhea > 12 months) the Stage of Reproductive Aging Workshop (STRAW) classification was used [18]. Additionally, premenstrual syndrome was evaluated according to the questions of the *menstrual cycle problems:* Self-Care Flowcharts of the American Academy of Family Physicians (<http://familydoctor.org/flowcharts/538.html>) which consideres dysmenorrhoea, emotional problems, oedema, mood swings, changes in mental alertness or ability to concentrate, tiredness and sleep disturbance in the premenstrual period.

*Others:* health status was defined in the manner used by the National Center for Health Statistics into the study Hormone Replacement Therapy. Knowledge and Uses in the United States [19] as a condition compatible with the performance of routine activities and no clinical history. Finally, age, marital status, level of education, work and state or private health assistance were also recorded.

### 2.3. Statistical analyses

Data were expressed as mean  $\pm$  standard deviation and analyzed with the program Epi-info, version 6.04. (Centers for Disease Control, Atlanta, GA, USA; OMS, Basel, Swiss). Differences were evaluated with ANOVA or Student's *t* test. Percentage differences were evaluated using  $\chi^2$ . A value of  $P < 0.05$  was considered statistically significant.

Logistic regression was used to assess the simultaneous influence of different variables on the risk of suffering climacteric symptoms or stress; both were considered as a dependent variable, and history of family dysfunction, life events, poor social support, premenstrual syndrome and perimenopausal status as independent variables. Variables were punctuated using the original cut point, thus for stress a score superior to 19 in Cooper's test, for family dysfunction

a score lower than 7 in Smilkstein's test; for poor social support a score lower than 29 in Duke's test; and, for Vital Events a score higher than 4 in Israel test. Climacteric symptoms were considered when scores in Greene scale were equal or superior to the mean. Entrance of variables into the model was considered with a 20% significance level, and the stepwise procedure was applied.

### 3. Results

A total of 300 women between 40 and 59 years old (mean  $48.1 \pm 5.9$  years) were included in this study. Of them, 118 (39.4%) have middle (12 years) or high education, 227 (75.6%) are married or live with their partner, 205 (68.3%) have their own house and 178 (59.3%) are beneficiaries of the National Health System (Table 1).

Perimenopausal women had higher stress scores and climacteric symptoms (Table 2), although the frequency of negative life events, family dysfunction or badly social support did not increase in this period of life.

The influence of psycho-social and menopausal status is recorded in Table 3. A history of premenstrual syndrome increased 3.6 folds the risk of climacteric

Table 1  
Socio-demographic characteristics of the women included in this study allocated in periods of 5 years

Age		Study level		Marital status		Work		Health system	
Group	<i>N</i>	Level	<i>N</i>	State	<i>N</i>	Activity	<i>N</i>		<i>N</i>
40–44	101	Basic	182	Single	45	Worker	95	NHS	178
45–49	77	Medium	100	Separated	6	Housewife	205	Private	30
50–54	67		15	Married/living with partner	227				
55–59	55	High	3	Widows	22			Don't have	80

NHS: National Health Service.

Table 2  
Scores of Greene scale (climacteric symptoms), Cooper Questionnaire (stress symptoms), Smilkstein's Family Apgar Test (family dysfunction), Duke-UNC Questionnaire (social support) and Vital Events Scale (life events) according to women's reproductive status

	Number (%)	Stress symptoms	Climacteric symptoms	Life events	Family dysfunction	Social support
Premenopausal	142 (47.3)	$19.7 \pm 8.8$	$0.90 \pm 0.56$	$2.9 \pm 1.9$	$7.5 \pm 2.7$	$37.4 \pm 11.4$
Perimenopausal	46 (15.3)	$23.4 \pm 9.3$	$1.14 \pm 0.66$	$3.2 \pm 2.4$	$7.6 \pm 2.6$	$35.5 \pm 11.8$
Postmenopausal	112 (37.4)	$19.8 \pm 9.9$	$0.97 \pm 0.62$	$2.9 \pm 2.1$	$7.4 \pm 2.7$	$37.1 \pm 10.0$
<i>F</i>		3.0	2.9	0.3	0.03	0.5
<i>P</i> <		0.05	0.05	ns	ns	ns

Data are given as mean  $\pm$  S.D.

Table 3  
Influence of psycho-social factors and women's reproductive status on the risk of suffering climacteric symptoms

	Anxiety	Depression	Somatic symptoms	Vasomotor symptoms	Sexuality	Total
(a) Univariate analysis						
Life events	7.5*** (2.9–20.5)	7.5*** (2.6–23.4)	2.6** (1.1–6.1)	2.0 <sup>ns</sup> (0.9–4.6)	1.5 <sup>ns</sup> (0.6–3.6)	2.7** (1.2–6.5)
Family dysfunction	1.5 <sup>ns</sup> (0.7–2.9)	3.4*** (1.6–7.3)	1.2 <sup>ns</sup> (0.6–2.4)	1.0 <sup>ns</sup> (0.5–1.9)	2.6** (1.1–5.8)	1.8 <sup>ns</sup> (0.9–3.6)
Poor social support	1.8 <sup>ns</sup> (0.9–3.8)	2.4* (1.1–5.2)	0.7 <sup>ns</sup> (0.4–1.6)	0.7 <sup>ns</sup> (0.3–1.5)	1.2 <sup>ns</sup> (0.6–2.7)	1.2 <sup>ns</sup> (0.6–2.5)
Premenstrual syndrome	2.7* (1.1–6.8)	3.6** (1.5–8.7)	4.7*** (1.8–12.9)	6.2*** (2.1–19.6)	2.4* (1.0–5.4)	3.6*** (1.5–9.0)
Perimenopause	1.5 <sup>ns</sup> (0.7–3.2)	1.7 <sup>ns</sup> (0.8–3.6)	2.6** (1.2–5.5)	2.5** (1.2–5.2)	0.7 <sup>ns</sup> (0.3–1.4)	3.0** (1.4–6.1)
(b) Logistic regression, risk (OR)						
Life events	7.8*** (3.1–19.8)	8.2*** (2.7–24.4)	2.4* (1.1–5.5)	1.8 (0.8–4.4)		2.3* (1.0–5.3)
Family dysfunction		2.7* (1.2–6.1)			2.7** (1.3–5.8)	1.9 (1.0–3.8)
Poor social support	2.3* (1.1–4.9)	2.6* (1.6–6.5)				
Premenstrual syndrome	3.2** (1.3–7.9)	5.7*** (2.2–14.8)	4.5*** (1.8–11.1)	5.9*** (2.1–16.1)	2.6* (1.2–5.6)	3.6* (1.5–8.5)
Perimenopause			2.3* (1.1–4.9)	2.3* (1.1–4.6)		2.9*** (1.4–6.0)

Univariate analysis (a) and logistic regression and (b) (OR: Odds ratio); ns > 0.05.

\*  $P < 0.05$ .

\*\*  $P < 0.01$ .

\*\*\*  $P < 0.001$ .

symptoms (CI: 1.5–9.0;  $P < 0.001$ ). Life events were strong predictors of risk of anxiety (7.5, CI: 2.9–20.5;  $P < 0.001$ ), depression (7.5, CI: 2.6–23.4;  $P < 0.001$ ) and somatic symptoms (2.6, CI: 1.1–6.1;  $P < 0.01$ ). In addition, family dysfunction implied a higher risk of depression (3.4, CI: 1.6–7.3;  $P < 0.001$ ) and sexuality dysfunction (2.6, CI: 1.1–5.8;  $P < 0.01$ ). Finally, poor social support only influenced risk of depression (2.4, CI: 1.1–5.2;  $P < 0.02$ ). The risk of vasomotor and somatic symptoms were also modulated by women's reproductive status. Perimenopause increased these risks by 2.5 (CI: 1.2–5.2;  $P < 0.009$ ) and 2.6 (CI: 1.2–5.5;  $P < 0.007$ ), respectively.

After adjusting for the other variables (logistic regression analysis), premenstrual syndrome was overall the main predictor for climacteric symptoms (Odds

ratio (OR): 3.6, confidence interval (CI): 1.5–8.5;  $P < 0.03$ ), followed by perimenopause (OR: 2.9, CI: 1.4–6.0;  $P < 0.001$ ) and negative life events (OR: 2.3, CI: 1.0–5.3;  $P < 0.05$ ). Negative life events appeared as main predictors for anxiety (OR: 7.8, CI: 3.1–19.8;  $P < 0.001$ ) and depression (OR: 8.2, CI: 2.7–24.4;  $P < 0.001$ ); poor social support increased the risk of anxiety (OR: 2.3, CI: 1.1–4.9;  $P < 0.05$ ) and depression (OR: 2.6, CI: 1.6–6.5;  $P < 0.05$ ); and finally, family dysfunction increased symptoms of depression (OR: 2.7, CI: 1.2–6.1;  $P < 0.05$ ), and sexual dysfunction (OR: 2.7, CI: 1.3–5.8;  $P < 0.001$ ).

Interestingly, in this study an important number of premenopausal women with regular cycles suffer from vasomotor symptoms (64.1%) and these women had higher scores in all dominions of the Greene and Cooper scales (Table 4).

Table 4  
Scores of climacteric symptoms (Greene) and stress (Cooper) in premenopausal women with vasomotor symptoms

Vasomotor symptoms	N	Climacteric Symptoms Dominions (Greene)					Stress (Cooper)
		Anxiety	Depression	Somatic	Vasomotor	Sexuality	
No	51	0.5 ± 0.4	0.7 ± 0.5	0.6 ± 0.4	0.0	0.7 ± 0.8	14.8 ± 8.3
Yes	91	0.9 ± 0.6	1.2 ± 0.7	1.2 ± 0.6	1.2 ± 0.7	1.3 ± 1.0	22.3 ± 8.1
<i>t</i>		4.0	4.1	6.4	11.3	3.6	5.2
<i>P</i> <	142	0.0001	0.0002	0.0001	0.0001	0.0005	0.0001

Data are given as mean ± S.D.

#### 4. Discussion

The main objective of our study was to evaluate the impact of menopause and psycho-social factors on climacteric symptoms. Several authors have suggested that somatic and psychological symptoms in middle age women are related to the cease of the ovarian function [7]. In this way, Kuh observed in English women that the risk for hot flushes increases 2.6 times in the perimenopause and 4.7 times in the postmenopause, for sleep dysfunctions, 1.5 and 3.4 folds, respectively and for sexual dysfunctions, 2.2 and 3.9 [20]. Moreover, in surgical menopause the onset of climacteric symptoms is sharp and often dramatic [21]. Alternatively, other authors have pointed out that previous life events are more important [22], and that menopause has not adverse effects on the well-being of climacteric women [23]. A possible explanation for this disagreement is the fact that climacteric symptoms begin some years before the onset of the menopause and after that they diminish significantly. Moreover, women have their own opinion that differs from experts. In a previous study we found that 87.9% of the women related the menopause to psychological complaints [24]. Another study, in English women of 45 years old, found that most of women experience psychological difficulties in the menopause, opinion that it is also shared by the general practitioners who take care of them [25].

In the present study, we confirm that climacteric symptoms and stress increased significantly during perimenopause and afterward fall to premenopausal values. We did not observe in the menopausal transition an increase of negative life events, family dysfunction or poor social support; conversely, we cannot explain the increase in climacteric symptoms during perimenopause by an increase of negative life events in this stage of life. These results disagree with data suggesting the importance of the environment in the psychological stress throughout climacteric period. Thus, Grant reported that negative events were strongly correlated with psychological symptoms [26]. Moreover, it has been considered that a good social support can moderate the negative effect of the life events and it can also influence on psychological distress of middle age women [27]. We have not observed; however, a deterioration in the social support during the period of highest symptoms neither an increase of prevalence environmental risk factors. A possible explana-

tion for this disagreement is the fact that climacteric symptoms begin some years before the onset of the menopause and after that they diminish significantly. In concordance with this hypothesis we found that the prevalence of irritability in premenopausal women was 27%, increasing up to 48% in perimenopause and decreasing to 29% after 5 years menopause [8]. In addition, Brown observed that migraine prevalence, joint complaints, weariness and insomnia predominated in the perimenopause and diminished later on [28].

After adjusting for the influence of psycho-social factors, premenstrual syndrome and women's reproductive status on climacteric symptoms, we observed that biological factors have a higher impact than the psycho-social ones (logistic regression). The main predictor of risk and the only factor that appears influencing all the areas of climacteric symptoms was a history of premenstrual syndrome. The American College of Obstetricians and Gynecologists described that between 20 and 40% of women in their reproductive years suffer from premenstrual syndrome [29]. The premenstrual syndrome responds to therapy with serotonergic antidepressants suggesting a biological etiology [30]. Hunter has pointed out that emotional and premenstrual complaints are excellent predictors of risk for climacteric symptoms in the menopausal transition [31]. Additionally, women with psychological disorders at age of 36 report more vasomotor symptoms (hot flushes or night sweats), sexual difficulties (vaginal dryness or difficulties with intercourse) and trouble sleeping at 47 years old [20].

The association found in this study between symptoms and menstrual irregularities supports a biological base for climacteric symptoms. However, when the Greene scale dominions were analyzed, only vasomotor and physical symptoms appeared related to perimenopause and premenstrual syndrome; whereas psychological symptoms appeared more influenced by the psycho-social factors mainly by negative life events. These facts are in agreement with published data suggesting that vasomotor symptoms are more strongly related to the menopause, whereas the psychological symptoms are related mainly to the psycho-social environment [32]. Porter reported in middle age women that climacteric syndrome was related only to vasomotor and somatic symptoms and not with psychological symptoms [33]. In addition, Olofsson attributed only vasomotor symptoms

and joint complaints to the climacteric syndrome concluding that the other symptoms were related to psycho-social and socio-cultural factors [34] and Vanwesenbeeck considered that only vasomotor symptoms should be included in the climacteric syndrome [35]. Summarizing, vasomotor symptoms are related to the menopause and the psychological symptoms to the life events. Nevertheless, the importance of the life events is not generally accepted; several authors consider that the negative life events are more frequently observed in women with previous psychological symptoms and not vice versa. Grant found a relation between psychological symptoms and preceding life events [36] and Amiel-Lebigre et al. showed that a higher frequency of negative life events was related to previous psychological conduct [37].

Our results demonstrated that life events, family dysfunction and poor social support are important as modulators of climacteric symptoms. Similarly, a Japanese study comparing symptomatic and non symptomatic menopausal women, showed that the frequency of negative life events was similar in both groups, but the severity of the climacteric symptoms was correlated to the way of facing problems, suggesting that the vulnerability to stress contributes to worsening the climacteric symptoms [38].

Finally, one must keep in mind that this study was done in a population with an important Spaniard genetic and cultural background, but also with a significant indigenous component [39]. Since it is well known that the cultural factor is a variable that may have a major influence in climacteric symptoms [40] our results cannot be extrapolated toward other populations.

In conclusion, climacteric symptoms are linked to the menopausal transition and appear mainly in women with biological predisposition, and finally, Psycho-social factors, mainly negative life events, are modulators of symptoms caused by the cease of ovarian function.

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