

Age of menopause and impact of climacteric symptoms by geographical region

S. Palacios, V. W. Henderson*, N. Siseles†, D. Tan‡ and P. Villaseca**

Palacios Institute of Women's Health, Madrid, Spain; *Departments of Health Research & Policy (Epidemiology) and of Neurology & Neurological Sciences, Stanford University School of Medicine, Stanford, California, USA; †Department of Obstetrics and Gynecology, Hospital de Clinicas, University of Buenos Aires, Argentina; ‡Section of Reproductive Endocrinology and Infertility, Department of Obstetrics and Gynecology, St. Luke's Medical Center, Quezon City, The Philippines; **Department of Endocrinology, Faculty of Medicine, Pontificia Universidad Católica de Chile, Santiago, Chile

Key words: MENOPAUSE, AGE OF MENOPAUSE, CLIMACTERIC SYMPTOMS, VASOMOTOR SYMPTOMS, REGIONAL DIFFERENCES

ABSTRACT

Objective To describe differences in the age of onset of menopause and in the prevalence of climacteric symptoms in different geographical areas.

Design Systematic review of published data on onset of menopause and symptoms in Europe, North America, Latin America and Asia.

Methods We identified publications by searching electronic databases, including MEDLINE (1966–October 2009) and EMBASE (1975–October 2009). Primary search criteria were age of menopause and climacteric symptoms. A sensitive analysis that excluded papers without full data was performed.

Results The median age at menopause in Europe ranges from 50.1 to 52.8 years, in North America from 50.5 to 51.4 years, in Latin America from 43.8 to 53 years, and in Asia from 42.1 to 49.5 years. The frequency of vasomotor symptoms varies widely depending on the geographical region, selection of criteria, and method of symptom identification. The prevalence of such symptoms ranges from 74% of women in Europe, 36–50% in North America, 45–69% in Latin America and 22–63% in Asia, as reported in different, large, epidemiological studies.

Conclusion There are wide geographical differences in the prevalence of menopausal symptomatology and some differences in the age of onset of menopause. Both in Asia and Latin America, women of poorer socioeconomic status have significantly earlier onset of menopause. Within a geographical region, there are ethnic differences in menopause symptoms. Given differences in study methodologies, firm conclusions are not possible. However, regional differences in age at menopause and in climacteric symptoms are important to acknowledge and lay the foundation for an informed approach to the management of menopause and an understanding of its impact on women's health in the different regions of the world.

INTRODUCTION

Climacteric symptoms occur in all regions of the world, although the prevalence of symptoms and demand for treatment differ widely among women of different

ethnic origins and with different cultural backgrounds^{1,2}.

Considering the diversity of variables that influence menopausal symptoms, it is not surprising that their

Correspondence: Dr S. Palacios, Antonio Acuña 9, 28009 Madrid, Spain

actual prevalence differs in each region studied³. This may be due to differences in study design, in the population group selected, sample size, use of dissimilar diagnostic or screening tools, and presence of other confounding factors. The prevalence of symptoms also varies within an ethnic group, depending on their country of residence⁴. Factors such as diet and climate have also been reported to influence the prevalence of menopausal symptoms, but evidence so far is not conclusive⁵. Most symptom studies have been carried out by focusing on women in small geographical areas⁶.

Perception of symptoms and distress caused by the menopausal transition have been shown to relate to women's general health, their employment and socio-economic status and previous life events⁷. Reporting of symptoms and help-seeking is affected by the attitude towards symptoms and treatment, which is further influenced by psychosocial, economic and cultural factors⁸. Identification of the association of climacteric symptoms in a particular setting and among cultural and ethnic groups appears to be critical⁹. The objective of this paper is to review published reports on age of menopause and climacteric symptoms, especially vasomotor symptoms, in relation to different geographical regions.

METHODS

To identify the studies of interest for the review, the following searching terms were used: age of menopause or climacteric symptoms and geographical areas or North America, or Latin America, or Europe, or Asia. The search was conducted in MEDLINE (1966–October 2009) and EMBASE (1975–October 2009). All authors participated in the analysis and interpretation of data, reviewed the article and approved the final version. One reviewer (S.P.) extracted data from the included articles by using a standard protocol to which the study team had agreed. The information on participant characteristics and outcome measures was collected. The primary endpoints were age of menopause and climacteric symptoms. A sensitive analysis that excluded papers without full data was performed.

CLIMACTERIC SYMPTOMS IN EUROPE

In 2009, the population of Europe was estimated to be 830.4 million, according to the United Nations¹⁰. Non-European countries situated in Europe in their entirety¹¹ account for another 94 million. Five transcontinental countries^{12,13} have a total of 240 million people, of which about half reside in Europe proper. Population growth is comparatively slow, and median age is comparatively high in relation to those for the world. Europe accounts for around 12% of the world's population, but, if demographic trends maintain their pace, Europe's share may fall to around 7% by 2050.

Declining birth rates (primarily in Eastern and Roman Catholic Europe) and high life expectancy in most European states mean that the aging and shrinking population will be a problem for many European economies and political and social institutions.

Studies of mitochondrial DNA have suggested a substantial genetic homogeneity of European populations¹⁴, with only a few geographical or linguistic isolates appearing to be genetic isolates as well¹⁵. Nevertheless, analyses of the Y chromosome¹⁶ and of autosomal diversity¹⁷ have shown a general gradient of genetic similarity running from the South-east to the North-west of the continent.

Age at menopause

Age at menopause was estimated in 5288 women, aged 30–60 years, randomly selected in nine European countries between 1998 and 2002¹⁸. The median age of natural menopause was 54 years. Determinants of earlier menopause were current smoking (hazard ratio (HR) 1.59; 95% confidence interval (CI) 1.27–1.98), body mass index > 30 kg/m² (HR 1.32; 95% CI 1.02–1.70) and low physical activity (HR 1.37; 95% CI 1.12–1.67).

There is a geographical trend of age at menopause, with the lowest age at menopause in the Southern Europe region and the highest in the Northern European region. In prior international comparisons, Northern countries, such as Sweden or Finland, have been shown to have the highest median age at menopause¹⁹. Additionally, the Italian Climacteric Research Group Study (ICARUS) is an example of the Southern Europe region. ICARUS is a prospective study of the effect of menopause on women's health that has been running in menopause clinics throughout Italy since 1995. A total of 4300 women with spontaneous menopause, aged 55 years or more, and observed for the first time at the participating centers were included and the mean age at menopause in the total population was 50.9 years²⁰.

The heterogeneity of the secular trend suggests some country-specific factors¹⁸, such as the improvement in both early-life nutrition and health, as well as in life-long nutritional status, with higher intake of protein-rich foods in younger women^{21–23}.

Climacteric symptoms

The most important European cross-sectional survey was conducted between December 2004 and January 2005 in seven European countries (Belgium, France, Germany, Netherlands, Spain, Switzerland and the UK)²⁴. A stratified sample of 4200 women (600 per country) aged 45–60 years was interviewed via a standardized computer-assisted telephone interview protocol by a professional independent market research

organization. Women included in the survey had to be postmenopausal and not longer than 5 years beyond menopause. Participation was voluntary, confidential and anonymous. The selection procedure was based on automatic random digit dialling and quotas were used for age, regional distribution and educational level to ensure that the sample was representative of the overall population of women from the seven participating European countries.

Most women included in this survey experienced one or more postmenopausal symptoms, and 63% of them rated these symptoms as being severe. It was noted that more women in the UK reported postmenopausal symptoms (overall and severe symptoms) compared to other European countries. The most frequently reported symptoms were hot flushes (74%), sleeplessness (58%), mood changes (57%), irritability (53%) and reduced sex drive (45%).

Most women indicated that 'hot flushes' was the symptom that most affected their lives (48%), followed by 'sleeplessness' (23%) and 'mood swings' (16%). This is reflected in the symptoms that were given as the reason to seek treatment, hot flushes being the most frequently mentioned reason (62%), followed by sleep problems (20%) and mood swings (17%). Forty-six percent of the respondents felt affected by the menopause (range: 33% in France to 58% in Germany), and 22% (range: 16% in Switzerland to 30% in the UK) reported a decrease in their quality of life. Most women (84%) agreed with the statement that severe postmenopausal symptoms should be treated.

The survey revealed that nearly all women experienced postmenopausal symptoms and that women feel affected by menopause. It should be noted that there were substantial differences between countries in both the prevalence of (severe) symptoms and their impact on daily life. For instance, many more women in North European countries reported menopausal symptoms and significantly more women felt affected by menopause, leading to a larger decrease in their quality of life. In France and Spain, the impact of menopause was significantly lower. Although real differences in symptom prevalence cannot be excluded, the greater part of the observed difference is probably related to cultural diversity in the expectations about menopause and in the perception of symptoms.

CLIMACTERIC SYMPTOMS IN NORTH AMERICA

The geopolitical boundaries of North America are generally considered to encompass Canada, the United States (US), Mexico, the nations of Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama), Greenland, Bermuda, St. Pierre and Miquelon, and the Caribbean island nations. This overview of menopause in North America, however, is

limited to just two countries: Canada and the US. Mexico, the countries of Central America, and the countries of the Caribbean are considered in the discussion of menopause in Latin America. Greenland (part of the Kingdom of Denmark), Bermuda (a British territory), and the French Territorial Collectivity of St. Pierre and Miquelon are, in this respect, perhaps more closely aligned to Europe. Despite important demographic, cultural and political differences between Canada and the US, similarities with respect to menopause symptoms and management far outweigh differences.

Canada has 33 million residents. Eighty percent of the population is urban, and 99% is literate. English and French are spoken as primary languages by 59% and 23% of the population, respectively. A woman's life expectancy at birth is 84 years, and the median age for the female population is 41.5 years. Like that of Canada, the population of the US, which numbers 307 million people, is literate (99%) and largely urban (82%). Federally recognized racial groups include white (80%), black (African-American, 13%), and Asian (4%). About 15% of the population is of Latin American (Hispanic) descent. English is the primary language of 82% of US residents and Spanish of another 11%. For US women, the median life expectancy at birth is 81 years, and the median female age is 38 years. The net migration rate is fairly high in both countries (net increases of 5.6 and 4.3/1000 population/year in Canada and the US, respectively). Total fertility rates are lower among Canadian women (1.6 vs. 2).

Age of menopause

The age at natural menopause has been examined in several North American studies and compared to that reported from other regions of the world. In the US, an important source of information on menopause is the Study of Women's Health Across the Nation (SWAN), a multicenter, multiethnic, community-based observational study of menopausal transition. The mean age of menopause was 51.4 years for 2200 SWAN participants who had experienced natural menopause²⁵. In a population-based cohort of over 22 000 women from three regions of the US, the median age of natural menopause was 50.5 years²⁶. In the Massachusetts Women's Health Study (MWHs) prospective cohort, inception of the menopausal transition occurred at a median age of 47.5 years, suggesting a median duration of just under 4 years²⁷. Interestingly, nearly 10% of the women experienced no menopausal transition at all. As in studies outside North America, current cigarette smoking significantly lowers the age of menopause^{25,27}. In SWAN, other factors linked to earlier menopause include lower education, unemployment, single marital status, no prior use of oral contraceptives, and nulliparity²⁵. Age at menopause was later among Japanese-American women than among women of

other racial or ethnic groups analyzed in the SWAN sample²⁵.

Induced menopause, usually as the result of bilateral oophorectomy, occurs, logically, at an earlier age than when natural menopause would have otherwise taken place. Approximately 600 000 hysterectomies are performed annually in the US²⁸, and about one-tenth this total in Canada. The most common indications in the US are uterine leiomyoma, endometriosis and uterine prolapse; overall rates of hysterectomy are higher among women aged 40–44 years. In Canada, leiomyoma is also the most common indication, but menstrual pain and bleeding are the second most common²⁹. By age 44 years, 18% of US women have undergone this common surgical procedure; by age 54 the prevalence is 28%³⁰. Hysterectomy rates are somewhat lower in Canada (about 4.5 per 1000 women³¹) than in the US (about 5.4 per 1000 women³²), and rates vary substantially by geographical region in both countries^{29,32}. Bilateral oophorectomy is performed at the time of hysterectomy somewhat more than half the time³³ and is infrequently performed in its absence. It can be estimated that a quarter million Canadian women reach menopause each year (natural or surgical) and that approximately 5.6 million women are now postmenopausal. Within the US, about 2.3 million women reach menopause each year, and approximately 49 million women are now postmenopausal. In both countries, a woman will spend on average one-half of her adult life (and somewhat over one-third of her entire life) in the postmenopausal reproductive stage.

Climacteric symptoms

In MWHs, the peak reporting frequency for vasomotor symptoms within the past 2 weeks increased during the perimenopause and peaked at about 50% just after the final menstrual period²⁷. Women with a shorter menopausal transition were less likely to report vasomotor symptoms. About half the women with hot flushes also reported sweats²⁷. A comparison between MWHs participants and women in the Canadian province of Manitoba suggested that almost identical proportions of women aged 45–55 years were ‘bothered’ by hot flushes or night sweats during the preceding 2 weeks (38% in the US, 36% in Canada)³⁴. Findings from SWAN indicate that menopausal symptoms in the US vary by race and ethnicity^{35–37}. For women aged 42–52 years and premenopausal or in the early menopausal transition at the time of SWAN enrolment, vasomotor symptoms within the past 2 weeks were more prevalent among African-American (46.5%) and Hispanic (49%) women and less prevalent among Japanese-American (34%) and Chinese-American (29%) women than among white women (37%)³⁵. Vaginal dryness was most common among US Hispanics³⁶. Aboriginal (Native American) women may experience fewer

vasomotor symptoms³⁸. In SWAN, lower education, increased body mass index, smoking and baseline symptoms of anxiety or depression were associated with vasomotor symptoms³⁷. Among Hispanics, symptoms vary by country of origin, and acculturation appears to play a complex role in the expression and reporting of menopausal symptoms³⁶.

CLIMACTERIC SYMPTOMS IN LATIN AMERICA

Latin America has approximately 570 million inhabitants and, although there are cultural similarities among the different countries, there are also great differences, both in indexes of poverty and of human development, as well as in health outcomes³⁹. Moreover, there are striking differences in health risks between the richest and poorest within each country⁴⁰.

The population in Latin America is mostly juvenile (less than 25 years old), but it is gradually aging⁴¹. In fact, in Argentina, Chile, Cuba and Uruguay, the adult population is already predominant over the juvenile population³⁹. Women’s life expectancy at birth is 70–80 years in most of the countries, although in some it is still 60–65 years³⁹.

There is special socioeconomical concern regarding aging in Latin America, because the population is getting old faster in this region than it historically did in the developed countries, with the aggravating circumstances of unequal access to efficient health care and prevention (sometimes even for basic health needs) and weak social protection systems⁴¹. Concerns are not only related to the risks of osteoporosis and cardiovascular disease, but also to the troubled expectation of maintaining a good quality of life in an inclusive society.

Age at menopause

The Collaborative Group for Research of the Climacteric in Latin America (REDLINC) performed a cross-sectional study, based on interviews, to determine the age of menopause in different countries in the region: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Honduras, Mexico, Panama, Paraguay, Peru, the Dominican Republic and Uruguay⁴². The interviews were performed in 17 150 healthy women, 40–59 years of age, who were accompanying patients at health centers, in diverse urban areas of their respective countries. The median age at menopause was 48.6 years, ranging from 43.8 to 53 years in the different study centers. Analysis of the data showed that women living in poorer countries, those with a lower educational level, and women living at high altitude (more than 2000 meters above sea level) were significantly more prone to an earlier menopause age. The latter observation confirms both previous findings in Chile⁴³ and in Peru⁴⁴, as well as in other regions of the world (Tibet, US). There was no relation

between menopause onset and cigarette smoking as has been described in several publications.

In a number of participating centers, the median onset of menopause was below the limits defined by the World Health Organization; the authors speculate that this might be due to the high altitude of many of the cities evaluated. Published studies on this association hypothesize that the hypoxia related to high altitude may influence follicle development, making women more prone to an earlier onset of menopause⁴⁵.

A study in a rural farming population of native-Bolivian Movima women ($n = 125$) describes a lower age at onset of natural menopause in this minority group: 42.3 ± 6.17 years⁴⁶. Most of these women (84%) had a high parity rate (> 4) and, although not living in high altitude, they had a low socioeconomic and cultural status, being mostly housewives and farmers, and only 1.5% of them hired workers.

There are no large studies published showing the prevalence of surgical menopause in Latin America. A small study in a Chilean city reports surgical menopause at 15.4% in a group of 250 postmenopausal women, and it occurred at a significantly earlier age than would natural menopause in this population (average 40.3 vs. 47.0 years, respectively)⁴⁷.

Climacteric symptoms

REDLINC carried out a multicenter study evaluating quality of life in middle-aged women, as assessed by the Menopause Rating Scale (MRS)⁴⁸. In this cross-sectional study, 8373 women, aged 40–59 years, were interviewed in 12 Latin American countries. The prevalence of impaired quality of life was high. More than 50% of the population surveyed in each country had moderate to severe MRS scores, the main risk factors being age, history of psychiatric consultations/use of psychotropic drugs, and male sexual dysfunction. On the other hand, hormone therapy, as well as engaging in healthy lifestyles, decreased the risk of presenting severe menopausal symptoms (odds ratio (OR) 0.65, 95% CI 0.56–0.76, $p = 0.0001$, and OR 0.59, 95% CI 0.50–0.69, $p = 0.0001$, respectively). A surprising aspect of this study was the finding that low socioeconomic status and lower education did not correlate with poor quality of life.

The Ecuadorian group of REDLINC recently confirmed similar findings on quality-of-life aspects in 409 middle-aged women. They also describe the most prevalent symptoms in the MRS score: hot flushes 68.9%, sleeping disturbances 68.4%, depressive mood 55.2%, and irritability 51.6%⁴⁹. In another study, they describe muscle and joint pain as a highly prevalent physical symptom (77%)⁵⁰.

The most recent in the series of studies published by REDLINC analyzes sexual dysfunction by measuring the Female Sexual Function Index (FSFI) in 7243

women aged 40–59 years⁵¹. This index assesses sexual function within diverse domains: desire, arousal, orgasm, pain, lubrication, and satisfaction. Sexual dysfunction was highly prevalent (56.8%) and varied widely in different populations in a range from 21% to 98.5%. The most important risk factor was vaginal dryness (OR 3.86, 95% CI 3.37–4.43). Another important risk factor, among others, was erectile and/or ejaculatory dysfunction in the partner (OR 1.89, 95% CI 1.61–2.09). It is worthy of notice that these risk factors are modifiable. On the other hand, a relationship with a faithful partner was a significantly protective factor (OR 0.66, 95% CI 0.59–0.73).

The main menopausal complaints in the rural farming native-Bolivian Movima women were loss of libido occurring in 51% of them, hot flushes (45%), and symptoms of urogenital atrophy: genital itching (40.8%) and dyspareunia (40%)⁴⁶. In this procreation-minded society, menopause is seen in a negative way because of the association with the end of fertility and the end of youth.

Latin American women are more prone to an earlier onset of menopause, with a highly negative impact on both their quality of life, as expressed by physical and psychological symptoms, as well as by a high prevalence of sexual dysfunction. These facts are of special concern, because of the unequal access to health care and the weak social protection systems in the countries in Latin America.

CLIMACTERIC SYMPTOMS IN ASIA

Asia, home to 60% of the world's population⁵², is a huge tapestry of cultural diversity made more diverse by major geographical differences, serious economic disparities and wide population gaps between countries. As a consequence, it is not possible to define a singularly 'Asian' perspective of menopause. Studies to date on the epidemiology of the climacteric in Asia provide only regional or country-specific data. These studies have demonstrated significant differences in the experience and symptomatology of menopause among different ethnic groups of women in Asia.

Age at menopause

In a regional survey of approximately 400 women from each of seven South-east Asian countries (Hong Kong, Indonesia, Korea, Malaysia, the Philippines, Singapore and Taiwan), the median age at menopause was 51.1 years². This median age at menopause appeared to be within the ranges observed in western countries.

Data from individual Asian countries demonstrated slightly lower ages at menopause. In Singapore, the mean age of natural menopause was 49.0 years in a mixed population of 1000 Chinese, Malay and Indian women⁵³. In a cross-sectional study of 9939 Chinese

women in the Guangdong province in southern China, the mean age of natural menopause was 48.9 years⁵⁴. Similarly, in 1497 Chinese women on the islet of Kinmen, Taiwan, the mean age at menopause was 48 years⁵⁵. Among women in Bangkok, Thailand, the average age at menopause was 49.5 years in one study of 2354 women⁵⁶ and 50.1 years in another study of 268 women⁵⁷. In a survey of 500 Filipino women, residing mostly in Metropolitan Manila, the average age of menopause was estimated at 48 years⁵⁸.

A much lower age at menopause was reported in the Haridwar district of Uttarakhand, a state located in northern India, where the recalled mean age at menopause was 45 years and the age at menopause computed by probit analysis was 46.8 years⁵⁹. In this setting, socioeconomic status and lifestyle significantly affected the age at the onset of menopause. Women who belonged to middle-class families had a later onset of menopause at 45.5 years compared to women of poor socioeconomic status who had onset of menopause at 42.1 years ($p < 0.05$).

Climacteric symptoms

Studies on the prevalence and severity of the core symptoms of estrogen deficiency, namely vasomotor symptoms and symptoms due to urogenital atrophy, among women in Asia have shown lower and considerably variable, but not negligible, rates compared to documented rates in women in Western countries.

Two regional surveys in Asia disclosed wide differences in the prevalence of vasomotor symptoms among women from different countries or ethnic groups. In the survey of women from seven South-east Asian countries, hot flushes and sweating were reported by 22.1% of menopausal women. Individual countries within the survey, however, show significant variations in the prevalence of symptoms. Women in South Korea (38.5%), Malaysia (30%), and the Philippines (30.2%) were found to have a higher prevalence of hot flushes than women in Hong Kong (10.2%), Indonesia (9.8%), Singapore (14.5%) and Taiwan (21.4%)².

In another survey of 1028 postmenopausal South-east Asian and South Asian women from 11 ethnic groups (Chinese, Filipino, Indian, Indonesian, Korean, Malay, Pakistani, Punjabi, Taiwanese, Thai and Vietnamese), 63.1% reported experiencing hot flushes, varying from mild to severe in degree. The mean baseline hot flush frequency was 1.6 flushes per day and only 15.2% of women exhibited a mean of ≥ 3 flushes per day⁶⁰. The percentage of symptomatic women ranged from 5% in Indonesian women to 100% in Vietnamese women. But even accounting for disparity in assessments at different trial sites in different countries, it was concluded that the large variation in the prevalence of hot flushes reflects genuine differences among the groups⁶⁰.

Reports from individual countries confirm the wide discrepancy in the prevalence of vasomotor symptoms among Asian women. In Singapore, the prevalence of significant hot flushes in the general study population was low (3.9%). Women of Chinese origin experienced a lower risk of menopausal symptoms when compared to those of either Malay and Indian ethnic groups ($p < 0.05$)⁵³.

Among Chinese women, vasomotor symptoms appear to be more frequently reported in Taiwan than in China and Hong Kong. In Taiwan, among 161 urban postmenopausal women, hot flushes were reported in 38% and night sweating in 18%⁶¹. Taiwanese women appear to have a much higher percentage of awareness of the menopause than do other Asian women. In southern China, hot flushes were experienced by 17.5% of 9939 perimenopausal women⁵⁴. In Hong Kong, two studies of perimenopausal women showed 10% and 23.3% prevalence of hot flushes and 5% and 15.4% prevalence of cold sweats or night sweating, respectively^{62,63}.

A relatively higher prevalence of vasomotor symptoms was reported among Indian and Sri Lankan women. Among 50 perimenopausal Indian women living in Delhi, 32% reported hot flushes and 24% reported night sweats⁶⁴. Two studies in Sri Lanka demonstrated similar incidences of hot flushes: 40.2% and 39.1% in 403 and 683 perimenopausal subjects, respectively. Night sweats were reported by 55.6% of women^{65,66}. Among Filipino perimenopausal women seen in a hospital-based menopause clinic in Manila, 56.7% complained of hot flushes⁶⁷. The other common symptoms were irritability (49.8%), nervousness (47.3%) and palpitations (46.8%). Thai women are reported to have the highest prevalence of hot flushes. Among Thai women in the Bangkok Metropolitan area, 82% of 683 symptomatic women reported having hot flushes⁶⁸.

Among Japanese women, the prevalence of vasomotor symptoms is reported to have increased over the past 20 years, but at a rate still lower than in most Western populations⁶⁹. Among healthy perimenopausal Japanese women living in Kyoto and Fukushima prefectures, the prevalence of vasomotor symptoms was 25.7%, but peaked at 52.6% among late perimenopausal women. The prevalence of hot flushes varies according to the hot flush term (kaa, nobose, and hoteri) used in describing the symptom. These terms differ in their physical location, characteristics and cultural salience. The prevalence of hot flushes ranged from 3% (hotto furasshu) to 17.1% (hoteri), depending on the individual term used, and was 22.1% when all hot flush terms were combined. Japanese women's language, including self-assessed kōnenki (climacteric) stage and hot flush terminology, seems to be more fine-grained than are Western biomedical terms of menopause status and hot flush, and may offer insight into subtle differences in

experiences and underlying physiology of menopause⁶⁹. Chilliness (hieshō) appears to be a significant vasomotor symptom among Japanese perimenopausal women. It was reported by 29.3% of generally healthy women⁷⁰.

The prevalence of symptoms due to urogenital atrophy in peri- and postmenopausal Asian women was reported in only a few studies. In 500 urban Filipino perimenopausal women, the reported rates were 36% for dyspareunia and 16% for urinary stress incontinence⁵⁸. In an older group of postmenopausal Filipino women with a mean age of 60 years, the prevalence of atrophic vaginitis was 54%, manifested in the form of vaginal pruritus (61%), vaginal dryness (58%), dyspareunia (56%), vaginal discharge (56%), dysuria (22%), burning or soreness (16%) and urinary tract infection (35%)⁷¹. Loss of bladder control was reported by 16% of 386 postmenopausal women in Taiwan⁶¹. Vaginal dryness was reported by 7.3% of 50 peri- and postmenopausal Indian women in Delhi⁶⁴.

The most common symptoms related to menopause reported by Asian women are symptoms that are not directly estrogen-dependent. Muscle and joint aches/pains appear to be the predominant symptom among peri- and postmenopausal women in Asia. In the regional survey involving South-east and South Asian women, the most common menopausal symptom reported was body aches/joint pains (86.3%), ranging from 76% in South Korean women to 96% in Vietnamese women⁷². This was followed by decline in memory in 80.1%, nervousness/irritability in 71.0%, and insomnia in 68.7% of women.

In Singapore, muscle and joint ache was the most commonly reported symptom (52.6%) in a mixed population of Chinese, Malay and Indian women⁵³.

Among peri- and postmenopausal women in northern India, the most prevalent symptom was muscle and joint pains (55.8%), followed by feeling tired or lack of energy (51.2%) and eye problems (49.6%)⁵⁹. Among Hong Kong Chinese perimenopausal women, musculoskeletal conditions were the top complaints reported by the respondents, followed by headaches and psychological symptoms⁶². In another study, the most common climacteric symptom was muscle and joint pain which was reported in 56.6% of 978 perimenopausal women⁶³.

Three studies in Thai women showed disparate results. In two studies, the symptom that showed the strongest association ($p < 0.001$) with menopausal status⁷, and considered to be the most common and most severe, was muscle and joint aches/pains (84.5%)⁷³. In another study, however, the most striking effect of menopause was a dramatic loss of sexual desire in 86.9% of postmenopausal women⁵⁶.

Among perimenopausal Sri Lankan women, one study reported insomnia (57.8%) and joint pains (55.8%) as the principal symptoms⁶⁵, while another study reported muscular discomfort (74.7%) and physical and mental exhaustion (53.9%) as the most prevalent menopausal symptoms⁶⁶.

Insomnia or troubled sleep is a frequent menopausal symptom. In Guangdong province in southern China, the three most prevalent symptoms reported were insomnia, joint and muscle pain and dizziness (in 37.2%, 35.7%, and 31.5% of the subjects, respectively)⁵⁴. Among Chinese women in Kinmen, Taiwan, the most frequently reported discomforts in women during the menopausal transition were troubled sleep, backaches and joint pain⁵⁵. In another study in urban Taiwan, the most common acute menopausal symptoms

Table 1 Prevalence of hot flushes according to geographic area

Geographic area	Study selected	Number of women	Age (years)	% Hot flushes
Europe	Genazzani <i>et al.</i> , 2006 ²⁴	4200	45–60	74
North America	Gold <i>et al.</i> , 2004 ³⁵	3302	42–52	Symptoms in the last 2 weeks: Hispanic: 49 African-American: 46–45 Caucasian: 37 Japanese-American: 34 Chinese-American: 29
Latin America	Chedraui <i>et al.</i> , 2008 ⁴⁸	409	40–59	68.9
Asia	Lam <i>et al.</i> , 2003 ⁶³	1028	40–65	63.1

Table 2 Median age of menopause in different geographic areas

Geographic area	Study selected	Number of women	Countries	Median age of menopause (years)
Europe	Dratva <i>et al.</i> , 2009 ¹⁸	5 288	9	54
North America	Gold <i>et al.</i> , 2001 ²⁵	2 200	1 (US)	51.4
Latin America	Castelo-Branco <i>et al.</i> , 2006 ⁴²	17 150	15	48.6
Asia	Boulet <i>et al.</i> , 1994 ²	400	7	51.1

in postmenopausal women were insomnia (42%), heart palpitation (34%), and irritability (34%)⁶¹. In Beijing, among generally healthy urban peri- and postmenopausal women, the most frequent symptom was 'experiencing poor memory' (84.1%)⁷⁴. Among 140 mid-life Japanese women, the three most prevalent symptoms were shoulder stiffness, memory loss and stress⁷⁵.

CONCLUSIONS

Much can be learnt from the studies of different cultures about their experience during and after the menopausal transition. It is also important for health-care providers to understand the differences between cultures, so that appropriate advice can be given and treatment can be tailored according to the needs of the community, irrespective of the country. Cross-cultural studies conducted so far have been small and have mostly been restricted to one country or one continent. This paper identifies enormous differences in the experience of menopause among women within the same culture and

across cultures (Tables 1 and 2). Each individual's experience of menopause may be dependent upon many other factors than physiological ones. Climacteric symptoms are a multidimensional phenomenon and reflect a combination of genetic bases, diet, physical changes, use of medications, cultural influences, and individual perceptions and expectations. We need multicenter, international studies using uniform standardized questionnaires to obtain data about women's experiences during climacteric in order to understand the variations in all of the factors that can affect the climacteric symptoms in different cultural groups from different countries.

ACKNOWLEDGEMENT

The authors thank Dr Chui Kin Yuen for his helpful suggestions and comments.

Conflict of interest Nil.

Source of funding Nil.

References

- Freeman EW, Sherif K. Prevalence of hot flushes and night sweats around the world: a systematic review. *Climacteric* 2007;10:197–214
- Boulet MJ, Oddens BJ, Leher P, et al. Climacteric and menopause in seven Southeast Asian countries. *Maturitas* 1994;19:157–76
- Gold EB, Sternfeld B, Kelsey JL, et al. Relation of demographic and lifestyle factors to symptoms in a multi-racial/ethnic population of women 40–55 years of age. *Am J Epidemiol* 2000;152:463–73
- Lock M, Kaufert P. Menopause, local biologies and culture of ageing. *Am J Hum Biol* 2001;13:494–504
- Sievert LL, Flanagan EK. Geographical distribution of hot flash frequencies: considering climatic influences. *Am J Phys Anthropol* 2005;128:437–43
- Dennerstein L, Leher P, Guthrie JR, et al. Modeling women's health during the menopausal transition: a longitudinal analysis. *Menopause* 2007;14:53–62
- Gold EB, Block G, Crawford S, et al. Lifestyle and demographic factors in relation to vasomotor symptoms: baseline results from the Study of Women's Health Across the Nation. *Am J Epidemiol* 2004;159:1189–99
- Obermeyer CM. Menopause across cultures: a review of the evidence. *Menopause* 2000;7(3):184–92
- Castelo-Branco C, Ferrer J, Palacios S, et al. The prescription of hormone replacement therapy in Spain: differences between general practitioners and gynaecologists. *Maturitas* 2006;55:308–16
- World Population Prospects: The 2008 revision. <http://esa.un.org/unpp/>
- European countries, 2009. http://europe.eu/abc/european_countries
- Demographics of Europe, 2009. http://in.Wikipedia.org/wiki/Demographics_of_Europe
- European commission.multilingualism, 2009. http://ec.europa.eu/education/languages/languages-of-europe/index_en.htm
- Torrioni A, Achilli A, Macaulay V, et al. Harvesting the fruit of the human mtDNA tree. *Trends Genet* 2006;22:339–45
- Simoni L, Calafell F, Pettener D, et al. Geographic patterns of mtDNA diversity in Europe. *Am J Hum Genet* 2000;66:262–78
- Roewer L, Croucher PJ, Willuweit S, et al. Signature of recent historical events in the European Y-chromosomal STR haplotype distribution. *Hum Genet* 2005;116:279–91
- Barbujani G, Goldstein DB. Africans and Asians abroad: genetic diversity in Europe. *Annu Rev Genomics Hum Genet* 2004;5:119–50
- Dratva J, Gómez Real F, Schindler C, et al. Is age at menopause increasing across Europe? Results on age at menopause and determinants from two population-based studies. *Menopause* 2009;16:385–94
- Thomas F, Renaud F, Benefice E, et al. International variability of ages at menarche and menopause: patterns and main determinants. *Hum Biol* 2001;73:271–90
- Meschia M, Pansini F, Modena AB, et al. Determinants of age at menopause in Italy: results from a large cross-sectional study. ICARUS Study Group. *Maturitas* 2000;34:119–25
- Nagel G, Altenburg HP, Nieters A, et al. Reproductive and dietary determinants of the age at menopause in EPIC-Heidelberg. *Maturitas* 2005;52:337–47
- Hardy R, Kuh D. Does early growth influence timing of the menopause? Evidence from a British birth cohort. *Hum Reprod* 2002;17:2474–9

23. Kuh D, Butterworth S, Kok H, et al. Childhood cognitive ability and age at menopause: evidence from two cohort studies. *Menopause* 2005;12:475–82
24. Genazzani AR, Schneider HPG, Panay N, et al. The European Menopause Survey 2005: Women's perceptions on menopause and postmenopause hormone therapy. *Gynecol Endocrinol* 2006;22:369–75
25. Gold EB, Bromberger J, Crawford S, et al. Factors associated with age at natural menopause in a multiethnic sample of midlife women. *Am J Epidemiol* 2001;153:865–74
26. Nichols HB, Trentham-Dietz A, Hampton JM, et al. From menarche to menopause: trends among US women born from 1912 to 1969. *Am J Epidemiol* 2006;164:1003–11
27. McKinlay SM, Brambilla DJ, Posner JG. The normal menopause transition. *Maturitas* 2008;61:4–16
28. Keshavarz H, Hillis SD, Kieke BA, et al. Hysterectomy surveillance: United States, 1994–1999. *MMWR CDC Surveill Summ* 2002;51(SS05):1–8
29. Millar WJ. Hysterectomy, 1981/82 to 1996/97. *Health Rep* 2001;12:9–22
30. Merrill RM. Hysterectomy surveillance in the United States, 1997 through 2005. *Med Sci Monit* 2008;14:CR24–31
31. Canadian Institute for Health Information. Health Indicators 2004, no.1
32. Wu JM, Wechter ME, Geller EJ, et al. Hysterectomy rates in the United States, 2003. *Obstet Gynecol* 2007;110:1091–5
33. Whiteman MK, Hillis SD, Jamieson DJ, et al. Inpatient hysterectomy surveillance in the United States, 2000–2004. *Am J Obstet Gynecol* 2008;198:e1–7
34. Avis NE, Kaufert PA, Lock M, et al. The evolution of menopausal symptoms. *Baillieres Clin Endocrinol Metab* 1993;7:17–32
35. Gold EB, Block G, Crawford S, et al. Lifestyle and demographic factors in relation to vasomotor symptoms: baseline results from the Study of Women's Health Across the Nation. *Am J Epidemiol* 2004;159:1189–99
36. Green R, Santoro N. Menopausal symptoms and ethnicity: the Study of Women's Health Across the Nation. *Women's Health (Lond Engl)* 2009;5:127–33
37. Gold EB, Colvin A, Avis N, et al. Longitudinal analysis of the association between vasomotor symptoms and race/ethnicity across the menopausal transition: Study of Women's Health Across the Nation. *Am J Public Health* 2006;96:1226–35
38. Webster RW. Aboriginal women and menopause. *J Obstet Gynaecol Can* 2002;24:938–40
39. UNDP (United Nations Development Programme), Human Development Report 2007/2008.
40. Belizán JM, Cafferata LM, Belizán M, et al. Health inequality in Latin America. *Lancet* 2007;370:1599–600
41. Publication of the United Nations: Envejecimiento, derechos humanos y políticas públicas. Huenchuan S, UN (United Nations), CEPAL (Comisión Económica para América Latina y el Caribe), CELADE (Centro Latinoamericano y Caribeño de Demografía), April 2009
42. Castelo-Branco C, Blumel JE, Chedraui P, et al. Age at menopause in Latin America. *Menopause* 2006;13:706–12
43. Blumel JE, Cubillos M, Brandt A. Relación entre el nivel socioeconómico y la edad de la menopausia. *Cuadernos Médicos Sociales* 1990;31:54–7
44. González G, Villena A. Age at menopause in central Andean Peruvian women. *Menopause* 1997;4:32–8
45. Escudero F, Gonzales GF, Góñez C. Hormone profile during the menstrual cycle at high altitude. *Int J Gynaecol Obstet* 1996;55:49–58
46. Castelo-Branco C, Palacios S, Mostajo D, et al. Menopausal transition in Movima women, a Bolivian native-American. *Maturitas* 2005;51:380–5
47. Quevedo I, Flores M, Castillo M. Reproductive history of women consulting in emergency services in a southern region of Chile. *Rev Méd Chile* 2005;133:929–34
48. Chedraui P, Blumel JE, Baron G, et al. Impaired quality of life among middle aged women: a multicentre Latin American study. *Maturitas* 2008;61:323–9
49. Chedraui P, San Miguel G, Avila C. Quality of life impairment during the female menopausal transition is related to personal and partner factors. *Gynecol Endocrinol* 2009;25:130–5
50. Chedraui P, Aguirre W, Hidalgo L, et al. Assessing menopausal symptoms among healthy middle aged women with the Menopause Rating Scale. *Maturitas* 2007;57:271–8
51. Blümel JE, Chedraui P, Baron G, et al. Collaborative Group for Research of the Climacteric in Latin America (REDLINC). Sexual dysfunction in middle-aged women: a multicenter Latin American study using the Female Sexual Function Index. *Menopause* 2009;16:1139–48
52. 2008 ESCAP Population Data Sheet, United Nations. <http://www.unescap.org>
53. Loh FH, Khin LW, Saw SM, et al. The age of menopause and the menopause transition in a multiracial population: a nation-wide Singapore study. *Maturitas* 2005;52:169–80
54. Yang D, Haines CJ, Pan P, et al. Menopausal symptoms in mid-life women in southern China. *Climacteric* 2008;11:329–36
55. Fuh JL, Wang SJ, Lu SR, et al. The Kinmen women-health investigation (KIWI): a menopausal study of a population aged 40–54. *Maturitas* 2001;39:117–24
56. Chompootweep S, Tankeyoon M, Yamarat K, et al. The menopausal age and climacteric complaints in Thai women in Bangkok. *Maturitas* 1993;17:63–71
57. Punyahotra S, Dennerstein L, Lehert P. Menopausal experiences of Thai women. 1. Symptoms and their correlates. *Maturitas* 1997;26:1–7
58. Ramoso-Jalbuena J. Climacteric Filipino women: a preliminary survey in the Philippines. *Maturitas* 1994;19:183–90
59. Kapur P, Sinha B, Pereira BM. Measuring climacteric symptoms and age at natural menopause in an Indian population using the Greene Climacteric Scale. *Menopause* 2009;16:378–84
60. Tan D, Haines CJ, Limpaphayom KK, et al. Relief of vasomotor symptoms and vaginal atrophy with three doses of conjugated estrogens and medroxyprogesterone acetate in postmenopausal Asian women from 11 countries: The Pan-Asia Menopause (PAM) study. *Maturitas* 2005;52:35–51
61. Pan HA, Wu MH, Hsu CC, et al. The perception of menopause among women in Taiwan. *Maturitas* 2002;41:269–74
62. Ho SC, Chan SG, Yip YB, et al. Menopausal symptoms and symptom clustering in Chinese women. *Maturitas* 1999;33:219–27
63. Lam PM, Leung TN, Haines C, et al. Climacteric symptoms and knowledge about hormone replacement

- therapy among Hong Kong Chinese women aged 40–60 years. *Maturitas* 2003;45:99–107
64. Gupta P, Sturdee DW, Hunter MS. Mid-age health in women from the Indian subcontinent (MAHWIS): general health and the experience of menopause in women. *Climacteric* 2006;9:13–22
 65. Goonaratna C, Fonseka P, Wijewardene K. Perimenopausal symptoms in Sri Lankan women. *Ceylon Med J* 1999;44:63–9
 66. Waidyasekera H, Wijewardena K, Lindmark G, et al. Menopausal symptoms and quality of life during the menopausal transition in Sri Lankan women. *Menopause* 2009;16:164–70
 67. Gonzaga FP. Symptoms and treatment of the menopause: urogenital symptoms. In Ratnam SS, Campana A, eds. *First Consensus Meeting on Menopause in the East-Asia Region*, Geneva 26–30 May 1997. Netherlands: Medical Forum International, 1997:40.
 68. Sukwatana P, Meekhangvan J, Tamrongterakul T, et al. Menopausal symptoms among Thai women in Bangkok. *Maturitas* 1991;13:217–28
 69. Melby MK. Vasomotor symptom prevalence and language of menopause in Japan. *Menopause* 2005;12:250–7
 70. Melby MK. Chilliness: a vasomotor symptom in Japan. *Menopause* 2007;14:752–9
 71. Jalbuena JR. Letter to the editor. Atrophic vaginitis in Filipino women. *Climacteric* 2001;4:75.
 72. Haines CJ, Xing SM, Park KH, et al. Prevalence of menopausal symptoms in different ethnic groups of Asian women and responsiveness to therapy with three doses of conjugated estrogens/medroxyprogesterone acetate: the Pan-Asia Menopause (PAM) study. *Maturitas* 2005;52:264–76
 73. Chaopotong P, Titapant V, Boriboonhirunsarn D. Menopausal symptoms and knowledge towards daily life and hormone replacement therapy among menopausal women in Bangkok. *J Med Assoc Thai* 2005;88:1768–74
 74. Chen Y, Lin SQ, Wei Y, et al. Menopause-specific quality of life satisfaction in community-dwelling menopausal women in China. *Gynecol Endocrinol* 2007;23:166–72
 75. Melby MK. Factor analysis of climacteric symptoms in Japan. *Maturitas* 2005;52:205–22