Maturitas 112 (2018) 12–17

Contents lists available at ScienceDirect

Maturitas

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

Vegans report less bothersome vasomotor and physical menopausal symptoms than omnivores

Bonnie Beezhold[a,*], Cynthia Radnitz[b], Robert E. McGrath[b], Arielle Feldman[b]

[a] Benedictine University, Lisle, IL, United States
[b] Fairleigh Dickinson University, Teaneck, NJ, United States

ARTICLE INFO

Keywords:
Menopause
Perimenopause
Menopausal symptoms
Vasomotor symptoms
Vegan diet
Omnivore diet

ABSTRACT

Objectives: Lifestyle modifications that may reduce menopausal symptoms have generated much interest. The vegetarian diet has been associated with a lower risk of chronic disease as well as a more healthy hormonal milieu. Our objective in this cross-sectional study was to survey peri- and postmenopausal women to investigate menopausal symptoms and dietary pattern.

Study design: Survey distribution in 2015–2016 was aimed at female vegans, vegetarians, and omnivores between the ages of 45 and 80 years, who were active on senior and vegetarian social networking websites and at vegan restaurants and events. Main outcome measures: We investigated vasomotor and physical symptoms as measured by the Menopause-specific Quality of Life Questionnaire (MENQOL) and dietary pattern classified by animal protein intakes reported in response to food frequency questions.

Results: Out of 754 participants who completed the survey, 604 reported they were perimenopausal (n = 121) or postmenopausal (n = 483), of whom 539 also completed the food frequency questions. We compared vasomotor and physical symptoms in omnivores (n = 304, consumed meat and/or poultry at least monthly) and vegans (n = 125, abstained from all animal proteins) using general linear models; covariates included age, exercise, hormone replacement therapy, presence of reproductive organs, and age at menopause. Among perimenopausal women, vegans reported less bothersome vasomotor ($p < 0.01$) and physical symptoms ($p < 0.01$) than omnivores. For both symptom types, more vegetables and less flesh food were associated with less bothersome symptoms (p values < 0.05).

Conclusion: Eating a plant-based diet may be helpful for women in menopausal transition who prefer a natural means to manage their symptoms.

1. Introduction

Most women in peri- or postmenopause report symptoms that negatively affect their quality of life. The Study of Women's Health Across the Nation (SWAN) followed mid-life changes occurring in women from various ethnic backgrounds over ten years. The study found vasomotor symptoms, or hot flashes and night sweats, are more strongly related to menopause than are other symptoms, with 60–80% prevalence [1,2]. Physical symptoms such as joint pain, fatigue, and sleep problems are also commonly experienced during this period [3,4]. While hormone replacement therapy effectively manages symptoms, risks and side effects have generated increasing demand for non-hormonal therapies [5].

Non-hormonal therapies for menopausal symptoms include lifestyle practices such as exercise regimens or use of herbal supplements such as black cohosh. However, efficacy of these therapies is generally insufficient or inconclusive [6]. There has also been much interest in single dietary factors that may be therapeutic, particularly plant foods containing phytoestrogens like isoflavones that can metabolize to estrogenic metabolites. One of the most widely used therapies for symptom management has been soy foods, based on the assumption that the high content of isoflavones would be as effective but safer than hormonal therapy [7]. Many primary studies have investigated the efficacy of phytoestrogens in reducing menopausal symptoms. While results have been conflicting [8], a recent systematic review and meta-analysis concluded that soy isoflavones were associated with modest reductions in hot flashes (but not night sweats) and vaginal dryness [9]. Because foods are rarely consumed alone and potentially therapeutic foods like soy may not be acceptable, analyzing diet patterns is a preferred strategy, as studies have demonstrated the positive impact of healthy diet patterns [10]. Although defined differently across studies, healthy diet patterns often are associated with vegetarian, vegan and

* Corresponding author.
E-mail address: bbeezhold@ben.edu (B. Beezhold).

https://doi.org/10.1016/j.maturitas.2018.03.009
Received 9 January 2018; Received in revised form 24 February 2018; Accepted 12 March 2018

plant based diets, which include high fiber and low fat content, large amounts of fruits, vegetables, whole grains, and legumes, and little or no animal foods [11].

Numerous studies comparing the health effects of Seventh Day Adventists who followed a vegetarian versus a non-vegetarian diet have consistently demonstrated that vegetarian diets are associated with lower body mass index and lower risk of chronic diseases such as coronary heart disease, type 2 diabetes, and cancer [12]. In fact, vegan diets which avoid all animal foods may actually confer additional disease protection for major chronic disease. Based on our literature review, no studies have explored the link between the vegan diet pattern and vasomotor or physical menopausal symptoms. Our objective was to recruit a large sample of vegan women in menopausal transition, capturing omnivores for comparison. The rationale for choosing vegans instead of vegetarians was to study a self-defined group following a diet rich in foods associated with reduced menopausal symptoms (e.g. soy, fruits, vegetables) and devoid of foods that might increase symptoms (e.g. animal fat). Animals foods consumed by vegetarians possibly decrease the proportion of plant foods consumed, making this diet less likely to correlate with symptom reduction. We hypothesized that participants on a vegan diet would report less severe vasomotor and physical menopausal symptoms than would omnivores. Our secondary aim was to investigate the relationship of specific food group consumption to menopausal symptoms.

2. Methods and materials

2.1. Study design

In our cross-sectional study, an online survey was delivered via SurveyMonkey® and later Qualtrics® from spring, 2015, through summer, 2016. The survey distribution was aimed at female vegans and omnivores, ages 45–80. The study was approved by the Institutional Review Boards (IRBs) of the collaborating universities.

2.2. Study protocol

Participants were recruited with a digital flyer posted on social networking websites and discussion boards. Gatekeepers of senior and vegan/vegetarian meet-up groups and other online communities, organizations, and events were contacted via email to request survey posting. In greater New York City and Chicago, paper flyers with the survey link were distributed at locations frequented by vegans, (e.g. health food store, restaurants, gyms, and diet-themed public events). Participants consented electronically. The survey took about 25 min. No incentive was provided for survey completion.

2.3. Measures

The Menopause-specific Quality of Life Questionnaire (MENQOL) [13] was embedded within the larger survey, and is a psychometrically sound tool for measuring menopausal symptoms/problems. It consists of 29 symptom questions that are classified into four domains: vasomotor (items 1–3), psychosocial (items 4–10), physical (items 11–26), and sexual (items 27–29). In this study, results for the vasomotor and physical subscales are reported. Vasomotor symptoms include hot flashes/flushes, night sweats, and sweating; physical symptoms include flatulence, muscle and joint aches, fatigue, sleep difficulties, neck/head/back aches, reduced strength/stamina, lethargy, skin changes, weight gain, facial hair, bloating, and frequent/involuntary urination. To reduce participant burden, we changed the format of items from a two-part (yes/no and then a "bothersome" rating) to a one-part 0–6 Likert scale asking respondents how bothersome each symptom was over the past month [13]. In the initial survey launch, three items on the MENQOL physical subscale were omitted due to clerical error; this was addressed statistically through mean substitution.

The MENQOL demonstrated validity and reliability in a postmenopausal female population aged 47–62 years old [13]. Discriminant construct validity of the physical subscale with both the Neugarten and Kraines' Menopause Symptom Checklist and Somatic and Psychosomatic Subscales was reported at 0.69; the coefficient reported for the vasomotor subscale with Somatic Subscales was lower at 0.40, but correlated with intensity of hot flushes at 0.66. Test-retest reliability correlation coefficients for the physical and vasomotor subscales were 0.81 and 0.85, and Cronbach's alpha coefficients were 0.87 to 0.82, respectively. In our study, Cronbach's alpha coefficients were 0.94 for the physical and 0.87 for the vasomotor subscales.

Because physical activity has been linked with menopausal symptom improvement [14], the survey included the Godin-Shephard Leisure-Time Physical Activity Questionnaire [15] which measures time spent over 7 days doing different kinds of exercise. Respondents reported how often they engaged in strenuous, moderate, and mild exercise. The weekly frequencies were multiplied by 9 (strenuous), 5 (moderate), or 3 (mild), and then summed to calculate total weekly activity scores. The questionnaire can accurately classify apparently healthy adults (18–64 yr.) into active and insufficiently active categories [15]. Studies measuring the reliability of the questionnaire in healthy adults found correlation coefficients of 0.75 and 0.62 for weekly activity [16,17].

Respondents answered a question about which animal foods they consumed at least monthly in order to categorize them as vegans (none endorsed) or omnivores (meat and/or poultry endorsed). More specific diet data were collected via a food frequency questionnaire. Foods included were linked to hormonal health, particularly high sources of omega-3 (n-3) fatty acids [18], polyphenol phytochemicals [19], and soy [20]. Participants were asked how frequently, on average, they consumed the food or beverage over the past year. The frequency option format was adapted from the National Institutes of Health Dietary Questionnaire II (https://aghealth.nih.gov/collaboration/qx/dhq.pdf), which consisted of: never or less than once a month, 1–3 times per month, once a week, 2–4 per week, 5–6 per week, once a day, 2–3 per day, 4–5 per day, and 6+ per day. The NIH questionnaire also asks about serving sizes, which improves dietary measurement precision. However, we only queried intake frequency to reduce respondent burden. Participants also reported total intake frequency from the following food groups: vegetables (not potatoes or corn), fruit (including dried, but not juice), flesh foods (meat, poultry, fish, or shellfish), dairy foods, egg dishes, and sweets.

Participants also reported their weight and height, which was used to compute body mass index.

2.4. Statistical analyses

Pearson correlation coefficients were utilized to examine the relationships between continuous and dichotomous variables. Analyses were conducted using general linear modeling (GLM). For both physical and vasomotor symptoms, three models were evaluated. In model 1, symptoms were regressed on to covariates, diet type, menopausal status, and the interaction between the last two variables. Model 2 added six food groups: total intake of vegetables, fruits, flesh food, dairy products, eggs, and sweets. To examine the impact of specific foods containing nutrient and/or phytochemical constituents that may affect menopausal transition, Model 3 added five more specific food elements: berries, cruciferous vegetables, leafy greens, soy, and high plant sources of omega-3 fats. Data were analyzed using SPSS, Version 24.0, and p values < 0.05 were considered significant.

3. Results

We obtained 990 responses; however, 236 volunteers did not complete the survey and were removed, leaving 754 participants who provided consent and met eligibility criteria. To obtain adequate group