A randomized controlled clinical trial on the effectiveness of cinnamon tea in reducing menopausal symptoms among perimenopausal women

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Abstract

Introduction Women in the perimenopausal period experience the height of menopausal symptoms due to the fluctuating levels of hormones because of ovarian dysfunction. This study aimed to determine the effect of cinnamon tea on menopausal symptoms among perimenopausal women.

Methods Perimenopausal women from Cainta, Rizal were recruited using cluster sampling and were randomly allocated into cinnamon tea or black tea groups. All participants were instructed to consume one tea bag once a day for 28 days. A response survey was conducted by the researchers using the Menopausal Rating Scale questionnaire every 2 weeks during the 28-day period to assess the number and severity of symptoms associated with perimenopausal stage.

Results The Menopausal Rating Scale scores of both cinnamon and placebo groups showed a statistically significant decrease in the number and severity of symptoms over time within groups. However, there was greater decrease in symptom number and severity among the cinnamon tea group and the difference was significant.

Conclusion Cinnamon tea resulted in a decrease in the severity of perimenopausal symptoms and may be an effective, economical and accessible alternative treatment for perimenopausal symptoms.

Key words: Cinnamon, perimenopausal symptoms

Menopause is a significant concern of most women due to the burdensome physical and psychosocial symptoms they experience. It occurs usually in a constant age, regardless of the race, age at menarche, socio-economic status or number of previous ovulations. However, menopausal symptoms may be experienced years prior the cessation of menstruation; this is also known as the perimenopausal stage. This is caused by fluctuating hormones, marking a shift from normal ovulatory cycles to the end of menstruation.[1,2] Estrogen deficiency associated with decreasing follicular function is the main factor for the major effects of menopause, affecting women both physically and psychologically.[3] During the perimenopausal

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transition, menstrual irregularity increases and many women experience symptoms of menopause, prompting them to seek health care.[4,5]

One of the standard treatments to alleviate the symptoms of menopause is menopausal hormonal therapy (MHT).[5] This includes estrogen, progesterone, or estrogen-progesterone therapy.[6] MHT regulates the intact hypothalamic-pituitary axis during the perimenopausal period, thus alleviating a woman's symptoms of menopause. However, there are undesirable effects related to MHT use, prompting women to seek alternative treatments in the form of "natural therapies" in relieving menopausal symptoms. These include minerals, vitamins, soy herbs, isoflavones, and custom compounded hormones.[7] Cinnamon may be one of these natural remedies for menopausal symptoms.

Cinnamon is a member of the laurel plant family; the dried inner bark of its tree has been used as a spice for thousands of years. Besides being used as a flavoring and scent for cosmetics, food, and liquor, cinnamon's properties are used for health benefits as well. Cinnamon tea has been demonstrated to selectively stimulate the production of progesterone in human adrenocortical cells through its component, cinnamaldehyde. Cinnamaldehyde comprises most of the oils of cinnamon (65-90%) with the other essential oils making up the remaining 1-8%. A different study found levels between 13.1 and 56.9mg of cinnamaldehyde per gram of cinnamon.[8] Another study showed that a dose-dependent increase in progesterone in a culture medium resulted from the exposure to cinnamaldehyde.[9] The consumption of cinnamon which contains cinnamaldehyde can help increase levels of progesterone. Pharmacological studies have been done on cinnamon's effects in treating gynecological problems related to irregular menstruation and menopause.[10] In addition, cinnamon is readily available and affordable. This study aimed to determine the effectiveness of cinnamon tea in reducing the menopausal symptoms of identified perimenopausal women.

Methods

A randomized single-blind, placebo-controlled clinical trial was conducted to determine if cinnamon could effectively reduce the severity of perimenopausal symptoms. Women from Barangay San Juan, Cainta, Rizal were recruited and allocated to receive either cinnamon or black tea for one month. The severity of symptoms was measured using a Filipino translation of the Menopausal Rating Scale. The research was approved for implementation by the UERMMMCI Research Institute for Health Sciences Ethics Review Committee.

Healthy perimenopausal Filipino women 39 to 51 years old residing in Barangay San Juan, Cainta, Rizal were selected using cluster random sampling of female residents from the sampling population. A random online generator was used to select one from among 40 sitios in the town. Excluded subjects were those currently on hormonal therapy and those taking medications including oral contraceptives and herbal medicines for menopause. The sample size for each comparison group was calculated using the SD_1 (2.91) and SD_2 (4.33), μ_1 (2.73) and μ_2 (0.026) that were taken from the study on Aphrodit capsule as management for menopausal symptoms. The sample size computed is eight for each group with a confidence interval of 99% and power of 90%.[11]

Subjects included in the study were interviewed to obtain demographic data and menopausal symptoms using the Filipino translation of the Menopausal Rating Scale (MRS) questionnaire, the results of which served as the study's baseline data (MRS 1). Subjects were then randomly allocated into treatment and control groups. The treatment group was given 1g of cinnamon in their tea per day, while the control group were assigned to 1g of placebo per day. Both groups underwent the trial for one month. The placebo used for this study was black tea, made from the leaves of the *Camellia sinensis* plant. The survey was conducted three times: at the start of the trial (MRS 1), after two weeks (MRS 2), and at the end of the month (MRS 3).

The MRS is a scale used to score symptom severity, which is defined by the frequency of occurrence of each menopausal symptom. The MRS questionnaire was translated from English to Filipino and then from Filipino to English by two different Filipino professors. The scale is comprised of 11 core symptoms divided into their three dimensions (subscales) - psychological (depressed, irritable, anxious, exhausted), somato-vegetative (sweating/ flushing, cardiac complaints, sleeping disorders, joint & muscle complaints), and urogenital (sexual problems, urinary complaints, vaginal dryness). The severity of symptoms was measured using a 5-point Likert scale, with each increasing point representing

increasing severity (0 = none, 1 = mild, 2 = moderate, 3 = severe, 4 = very severe). The sum of the scores for each subscale was added and made up the total score, the highest of which is 44.[12] A higher MRS score meant more severe symptoms.

The internal consistency of the MRS scale measured with Cronbach's alpha showed coefficients that varied between 0.6 and 0.9 across countries for the total score and the three sub-scales. The test-retest correlation coefficients (Pearson's correlation) of the total score was 0.9 for all countries, indicating good measure of internal consistency. In a large multinational survey in nine countries, similar factor loadings of the 11 items from the three domains of the MRS scale were observed. This suggests that the MRS scale measures the same phenomenon in different countries and that it can be used as well in clinical studies.[12]

Identical looking marked bags of either cinnamon tea or placebo (black tea), which were unknown to both the researcher and the respondents, were placed in a non-transparent container. The researcher indiscriminately took one bag from the container and gave it to the respondent. After handing out the bag, the researcher checked and identified the mark on the bags that differentiated cinnamon tea from black tea. Group assignment was then noted by the researchers on the first visit. Participants in the experimental group were given cinnamon tea (1g of cinnamon powder served in hot water, once a day), while the control group was given a placebo (1g black tea served in hot water, once a day). Participants took the tea once a day for four weeks.

For the duration of the clinical trial, the participants were contacted via phone call once a week and an SMS was sent to each participant every day to remind them to take the assigned tea. Random visits were also conducted wherein the used and remaining tea bags were checked to ensure the compliance of the participants.

Identification of variables that might influence the findings was analyzed by testing the differences between groups using Chi-square. The significance of the difference in MRS scores across time and between groups was determined using mixed MANOVA and MANOVA, respectively. The analysis of this study was performed using the IBM Statistical Package for the Social Sciences (SPSS).

Results

Forty-two perimenopausal women were included in the study, with 22 assigned to the cinnamon tea group and 20 to the black tea group. Their mean age (45.9 vs 45 years) and age at menarche (12.8 vs 13.3 years) were comparable. Around 90% of the women had their menarche at 15 years or younger. The distribution of the subjects in terms of the other demographic parameters between the cinnamon tea and black tea groups was comparable, as seen in Table 1. There was no significant difference between the baseline MRS scores of the cinnamon tea and black tea groups.

As shown in Table 2, the cinnamon tea group's baseline scores were lower than the placebo group's (MRS 1) though the difference was not significant ($p = 0.405$). For MRS 2, cinnamon tea group's scores

Table 1. Comparison of the clinic-sociodemographic characteristics of 42 subjects.

Characteristics	Cinnamon tea n (%)	Black tea n (%)	p-value
Frequency	22 (52.4)	20 (47.6)	0.76
Age (yr)			0.38
39-44	7 (16.7)	9 (21.4)	
45-51	15 (35.7)	11 (26.2)	
Age of menarche (yr)			0.25
10-15	21 (50.0)	17 (40.5)	
16-20	1 (2.4)	3 (7.1)	
Religion			0.26
Catholic	18 (42.9)	18 (42.9)	
Christian	4 (9.5)	1 (2.4)	
Muslim	0 (0)	1 (2.4)	
Civil Status			0.23
Single	6 (14.3)	6 (14.3)	
Married	13 (31.0)	14 (33.3)	
Widowed	3 (7.1)	0 (0)	
Education			0.60
Elementary	3 (7.1)	5 (11.9)	
High school	16 (38.1)	14 (33.3)	
College	2 (4.8)	1 (2.4)	
Vocational	1 (2.4)	0 (0)	
Occupation			0.67
None	1 (2.4)	2 (4.8)	
Housewife	9 (21.4)	6 (14.3)	
Skilled worker	5 (11.9)	3 (7.1)	
Government	3 (7.1)	2 (4.8)	
Commerce	4 (9.5)	7 (16.7)	

were lower than placebo's. For MRS 3, cinnamon tea group's scores were lower than placebo's. Table 2 shows a decrease in the MRS scores from baseline to week 4 with the cinnamon tea group showing a larger decrease. Mixed MANOVA shows that the decrease across time is significant ($p < 0.05$). MANOVA shows that the difference in the decrease between the cinnamon tea and black tea groups is significant ($p < 0.05$).

Table 2. Comparison of Menopause Rating Scale (MRS) scores.

	Cinnamon tea	Black tea	p-value
MRS 1	10.09	12.05	0.405
MRS 2	3.82	9.20	0.009
MRS 3	2.86	6.20	0.109
Mixed MANOVA	F (1.41, 53.49) = 34.95		< 0.05
MANOVA	F (1, 38) = 5.35		< 0.05

None of the participants experienced any allergic reaction or adverse events while taking either cinnamon or black tea.

Discussion

In this study, the effectiveness of cinnamon tea in comparison with placebo in perimenopausal women was evaluated. The MRS scores of the cinnamon tea group and the placebo tea group showed a statistically significant decrease in number and severity of symptoms throughout the study. However, there was greater decrease in symptom in the cinnamon tea group.

It is shown that there is a decrease in severity of symptoms in MRS measures within subjects across time. The researchers observed the reduction of symptoms from baseline, up to four weeks after taking the treatment. The results showed that symptoms significantly decreased across time. The symptoms were highest during the baseline measurement, then decreased two weeks after consuming the teas, and were lowest after four weeks. The decreases between the different points are all independently significant. This indicates a general reduction in symptom severity of the participants, weeks after consuming the tea. The MANOVA showed that the consumption of tea significantly reduced the severity of symptoms, however, the type of tea is significant. Particularly, the cinnamon tea group experienced significantly less symptoms than the placebo group.

The results of the study showed that cinnamon tea significantly reduces perimenopausal symptoms. This is consistent with a study on the effect of Aphrodit capsule, consisting of 40 mg of *Tribulus terrestris* fruits, 12.27 mg ginger, 33 mg saffron and 11 mg of cinnamon, on somatic symptoms of postmenopausal women. The study also used the Menopausal Rating Scale as their tool with a four-week duration. They concluded that Aphrodit capsule reduces hot flashes, sleep and musculoskeletal disorders in postmenopausal women.[11] Another study showed a significant decrease in menopausal hot flashes with the use of Gui Zhi Tang, a cinnamon twig decoction with added flavors.[13]

In conclusion, this study shows that the consumption of cinnamon tea demonstrated a decrease in the severity of perimenopausal symptoms and may be an effective, economical and accessible alternative treatment for the reduction of the severity of perimenopausal symptoms.

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