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The relationship between nutritional status, anthropometric measurements and hemogram parameters in preobese and obese women before and after menopause

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ABSTRACT

Objective: The nutritional status of pre-obese and obese women in the premenopausal and postmenopausal period is thought to be associated with anemia. In this study, we aimed to reveal the extent to which they meet their daily energy and nutrient needs and the relationship with the development of anemia by examining the food consumption records of women in the premenopausal and postmenopausal periods.

Material and Method: Women who applied to the Ataşehir District Health Directorate Healthy Nutrition and Active Life Unit for "Nutrition and Diet Consultancy" between May-July 2019 were included in the study. Women were divided into two groups as premenopause (36-45 years old) and postmenopause (46-73 years old) and their anthropometric measurements and nutritional status were evaluated. Serum glucose, blood urea nitrogen (BUN), creatinine, total-cholesterol, triglyceride, HDL, LDL, AST, ALT, iron, iron binding capacity, ferritin, vitamin B12, TSH, free T4, vitamin D and hemogram parameters of all participants were recorded.

Results: The waist circumference of 67.5% of the women in the premenopause group and 75% of the women in the postmenopausal group were above 88 cm. The blood BUN and HDL levels of premenopausal women were found to be lower than those in the postmenopausal period (BUN: 10.6±3.51 versus 15.06±4.96 and HDL: 54.1±9.1 versus 59, respectively. 3±13.5; $p < 0.05$). Premenopausal women had lower blood ferritin levels and higher iron binding capacity (WBC) compared to postmenopausal women (Ferritin: 15.8±11.5 versus 33.5±25.4 and DBT: 311.12±61.7 vs 287.50±41.93; $p < 0.05$). One of the important results of the study was the higher levels for vitamin D, AST and ALT in women in the post-menopausal period ($p < 0.05$).

Conclusion: It was determined that women in the premenopausal period did not receive enough iron and vitamin D to meet their needs. For this reason, daily food consumption should be adjusted accordingly, and lifestyle changes should be made to acquire healthy eating habits.

Keywords: Anemia, anthropometric measurements, nutrition, hemogram, menopause

INTRODUCTION

While deprivation and malnutrition are the main causes of disease and death in developing countries, eating disorders and obesity are more dominant problems in developed countries (1). Becoming overweight or pathological weight loss is inevitable when adequate and balanced nutrition cannot be achieved. Excessive weight gain is described as obesity, while excessive weight loss is defined as cachexia.

Body mass index (BMI), recommended by the World Health Organization, is still used in calculating obesity today. Different methods are also used for obesity classification, including waist circumference (WC) and central-peripheral fat mass. Recent data show that the incidence of obesity is rapidly increasing. This situation has made obesity a worldwide public health problem because excessive weight gain poses a high risk for many

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diseases, especially cardiovascular diseases, diabetes and cancers (2). Weight gain in the menopausal period is particularly striking. It was determined that women in the menopausal period gain approximately 0.7 kilograms per year, regardless of their racial-ethnic origin (3-5).

Menopause is characterized by low serum estradiol levels and high follicle stimulating hormone (FSH) levels due to complete or partial depletion of the follicles in the ovaries (6). Generally, between the ages of 45 and 55, there is a transition period to menopause (pre-menopausal period lasting 3 to 8 years). Since there is no monthly blood loss after menopause, the need for iron is less than in the pre-menopausal period (7,8).

In this study, the aim was to conduct a retrospective study to reveal iron deficiency anemia, which is thought to be related to nutritional status, by comparing the anthropometric measurements and blood parameters of pre-obese and obese women in the premenopausal and postmenopausal periods.

MATERIAL AND METHOD

The study is an analytical study and retrospective observational (case-control) study. For the research, permission was obtained from the Ethics Committee of the Health Sciences University Hamidiye Non-Interventional Ethics Committee (Date: 29.03.2019, Session No: 2019/3, Decision No: 19/33). This study was conducted with the approval (Date: 26/06/2019 6028, Decision No: 16867222-604-01-01) of the Republic of Turkey Ministry of Health Research Platform. Permission was obtained from the Istanbul Provincial Health Directorate for the participants to be included in the study. All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Study Design

A questionnaire was applied, and anthropometric measurements were performed for to voluntary preobese and obese women who applied to the Ataşehir District Health Directorate Healthy Nutrition and Active Life Unit for "Nutrition and Diet Consultancy". Women were grouped according to their age as premenopause and postmenopause. A total of 80 preobese or obese participants, with 40 people between the ages of 35-44 and a postmenopausal group of 40 people between the ages of 45-72 were included in the study. Those who had any acute or chronic disease that may cause iron deficiency anemia (hyperthyroidism, hypothyroidism, diabetes mellitus, infection, bleeding, hemorrhoids, cancer and hematological diseases, etc.), regular medication users (excluding vitamins and minerals), those who received iron replacement therapy in the last 6 months, those who had gynecological surgery, who had any metabolic disease, and any hormone replacement therapy (HRT) were excluded from the study.

Research Plan

First of all, the "Informed Consent Form" was read to the women participating in the study voluntarily and their consent was obtained. Survey questions were answered during face-to-face interviews. In the first part, there were questions determining the demographic characteristics of the participants. The second part included the "24-Hour Nutrition Form" including nutritional status evaluations of the individuals. Anthropometric measurements were height, body weight, waist circumference and body fat ratio measurements.

Anthropometric Measurements

Body weight and height were measured by using Tanita brand SC240MA model bioelectric impedance device with a sensitivity of 100 grams. In order to secure accurate measurements, all measurements were made in bare and dry feet after ensuring the of conditions such as three hours after getting out of bed, after going to the toilet, three hours after exercising, and approximately three hours after meals and excessive fluid intake. The same scale was used for all measurements.

Height was measured with feet side by side, head on the Frankfurt plane (eye triangle and auricle parallel to the ground) with a 0.01 cm sensitive height measuring device. Waist circumference was measured with a non-stretch tape measure. Again, the body fat ratio was automatically measured by the device during body weight measurements.

Determination of Food Consumption Status

Food consumption was determined by asking the participants face-to-face using the 24-hour reminder method. While recording food consumption, the volunteer participant was asked to indicate the amount of food consumed by hand and finger measurements and/or kitchen measurements.

Food consumption quantities were calculated according to references included in the located in Turkish Nutrition Guide "standard portion sizes and quantities of foods according to food group in Turkey" (9). In these definitions, food consumption was recorded by questioning the volunteer participants in detail using kitchen measurements (bowl, tablespoon, ladle, water glass, cup, dinner plate) and hand and finger measurements (fist and palm). Following the determination of the nutrient consumption amounts, volunteers' daily energy, water, fiber, polyunsaturated fat, cholesterol, macro (protein, fat, carbohydrate) and micro (A, E, B1, B2, B6 and C vitamins, carotene, folate, sodium, potassium, calcium, magnesium, phosphorus, zinc) nutrient consumption and the amount of iron they received from foods were calculated using the

Nutrition Information Systems Package Program (BEBIS) version 7.2. Consumption amounts were compared with the recommended adequate intake in the Turkish Nutrition Guide (9). Energy and nutrient supply ratios of 66% were classified as under consumption and ≥133% as excess consumption (10).

Biochemical Analysis

After the blood samples were centrifuged, they were sent to the Public Health Laboratory by couriers and measurements were made under the supervision of laboratory experts with appropriate kits. Glucose, blood urea nitrogen (BUN), creatinine, total cholesterol, triglyceride, high-density lipoprotein (HDL), low-density lipoprotein (LDL), aspartate transaminase (AST), alanine transaminase (ALT), iron, total iron-binding capacity (TBIC), ferritin, vitamin B12, thyroid stimulating hormone (TSH), free T4, 25-hydroxy vitamin D and hemogram parameters were tested. Moreover, all participants in the study were asked to bring any biochemical analyses which were performed by the Family Medicine Unit in the last six months with them.

Statistical Analysis

Microsoft excel was used for all graphical representations and IBM Statistical Package for Social Sciences version 25 (SPSS) Chicago, IL, USA software was used for statistical analysis. Unpaired t test was used for parametric data in comparison of premenopause and postmenopausal groups and the Mann-Whitney U test was used for the analysis of nonparametric data. Pearson correlation analyses were performed for the analysis of non-parametric data of all variables of the study, and Spearman correlation was used for the analysis of parametric data.

RESULTS

When **Table 1** is examined, the difference between the ages in the premenopause and postmenopausal groups was statistically significant as expected (p<0.001). While the difference in favor of women in the premenopausal group in terms of mean height was statistically significant (p<0.05), there was no significant difference between mean weight (p> 0.05). The mean BMI of both groups were found to be statistically close to each other (p> 0.05).

Looking at **Table 2**, 12.5% of the participants in the premenopause group and 37.5% of the participants in the postmenopausal group had at least one chronic disease and the difference was statistically significant (p<0.05). There was also a difference in terms of anemia status against women in the premenopausal group (p<0.05). Of those in the premenopause group with chronic diseases, 40% stated that they had asthma and 40% had coronary heart disease. In the postmenopausal group, 73.3% of those with chronic diseases stated that they had hypertension and 20% had asthma.

Table 1. Some demographic and anthropometric data of the participants in the premenopausal and postmenopausal groups

	Premenopausal group	Postmenopausal group	P value
N	40	40	-
Age, year	41.4±3.0	54.7±6.6	a<0.0001
Height, cm	160.0±5.2	156.2±5.5	a<0.0022
Weight, kg	81.28±17.13	77,16±11.20	a0.2068
BMI, kg/m2	31.74±6.47	31,74±5.19	a0.9970
Waist circumference, cm	95.20±13.23	96.65±11.20	a0.5983
Body fat percentage, %	38.76±6.34	39.36±4.88	a0.6394

a Unpaired t test, p<0.05 is statistically significant.
N: Number of the patients BMI: Body Mass Index

Table 2. Statement of anemia and chronic disease status of the participants in the premenopausal and postmenopausal groups

	Premenopausal group	Postmenopausal group	P value
N	40	40	-
Anemia condition			
Yes, n (%) No, n (%)	12 (%30) 28 (%70)	3 (%7.5) 37 (%92.5)	b0.0442
Chronic disease status			
Yes, n (%) No, n (%)	5 (%12.5) 35 (%87.5)	15 (%37.5) 25 (%62.5)	b0.0491

b Mann-Whitney Test.
N: Number of the patients

BUN, HDL, AST and ALT levels of women in the premenopausal period were found to be lower than the postmenopausal group (p<0.05) (**Table 3**). Compared to the postmenopausal group, women in the premenopausal group had lower blood ferritin levels, whereas iron binding capacity values were higher (p<0.05). In addition, 25-OH Vitamin D levels of women in the premenopausal group were lower than postmenopausal group (p<0.05). Hgb levels were lower in premenopausal women than in the postmenopausal group (p<0.05). However, it was found that HCT, MCV and RDW values did not accompany this decrease (p>0.05).

Macro and micronutrient consumption rates in the diets of women in the premenopause and postmenopausal groups are shown in **Tables 4** and **Table 5**. There was no statistically significant difference between the women in the premenopausal and postmenopausal groups in terms of daily energy, water, protein, fat, carbohydrate, fiber, and polyunsaturated fat intake in their diets (p>0.05). This means that both groups are similar in terms of energy, water, protein, fat, carbohydrate, fiber, and polyunsaturated fat intake. However, daily cholesterol intake was found to be statistically higher in the premenopausal group compared to the postmenopausal group (p<0.05).

Table 3. Data on blood biochemistry analysis results of the premenopausal and postmenopausal women

	Premenopausal group	Postmenopausal group	P value
N	40	40	
Glucose, mg/dL	91.2±8.4	97.1±14.2	b0.0697
BUN, mg/dL	10.6±3.51	15.06±4.96	a<0.0001
Creatinine, mg/dL	0.65±0.1	0.68±0.09	a0.2080
Cholesterol, mg/dL	212.7±33.8	227.58±41.22	a0.0826
Triglyceride, mg/dL	123.8±61.1	137.4±68.5	a0.3498
HDL, mg/dL	54.1±9.1	59.3±13.5	a0.0492
LDL, mg/dL	133.3±29.4	141.6±34.9	a0.2540
AST, IU/L	18.3±4.8	22.1±7.2	a0.0069
ALT, U/L	16.9±7.3	23.7±12.3	a0.0034
Iron, µg/dL	66.7±23.2	70.43±21.30	a0.4567
TIBC, µg/dL	311.12±61.7	287.50±41.93	a0.0482
Ferritin, ng/mL	15.8±11.5	33.5±25.4	a0.0001
Vitamin B_{12}, pg/mL	240.7±211.5	261.4±143.3	a0.6106
25-hydroxy vitamin D, ng/mL	16.91±6.14	24.94±19.54	a0.0152
Hgb, g/dL	12.41±1.03	12.87±0.92	a0.0391
WBC, 10^3/µL	7.06±1.38	6.28±1.09	a0.006
RBC, 10^6/µL	4.52±0.29	4.60±0.35	a0.2146
HCT, %	37.89±2.85	39.01±2.52	a0.0654
MCV-fL	82.15±12.74	84.96±4.78	a0.1950
RDW-%	13.97±1.05	13.88±1.13	a0.7120
PLT, 10^3/µL	273.18±67.45	246.03±51.57	a0.0466

a Unpaired t test, b Mann-Whitney Test,
N: Number of patients in the group. BUN: Blood urea nitrogen, HDL: High-density lipoprotein (HDL), LDL: Low-density lipoprotein, AST: Aspartate transaminase, ALT: Alanine transaminase, TIBC: Total iron-binding capacity, Hgb: Hemoglobin, WBC: White blood cell, RBC: Red blood cell, HCT: Hematocrit

Table 4. Macro nutrient and water consumption amounts of the participants in the premenopausal and postmenopausal groups

	Premenopausal group	Postmenopausal group	P value
N	40	40	
Dietary energy, kcal/day	1650±392	1500±309	a0.055
Water, mL/day	2839±792	2625±1059	a0.311
Dietary protein, gr/day	61.4±19.7	56.8±14.2	b0.444
Dietary fat, gr/day	70.5±26.2	62.8±19.1	b0.201
Dietary carbohydrate, gr/day	188.8±46.0	173.3±58.6	b0.064
Dietary fiber, gr/day	23.6±7.9	22.9±7.6	b0.422
Dietary cholesterol, mg/day	362.1±254.1	242.3±147.6	b0.014

a Unpaired t test, b Mann-Whitney Test,
N: Number of the patients

DISCUSSION

Menopause is one of the important periods of a woman's life and is a natural process of normal aging (11,12). Changes occur in blood biochemistry with hormonal changes due to menopause. As a reflection of this, eating habits can change, the tendency to obesity increases, and metabolic and physical changes can also be involved. Therefore, knowing what kind of changes might occur in women in this period will enable them to take precautions in advance and acquire nutritional habits according to the needs.

Table 5. Micronutrient consumption amounts of the participants in the premenopausal and postmenopausal groups

	Premenopausal group	Postmenopausal group	P value
N	40	40	
Dietary vitamin A, µg/day	1153± 741	1380±1859	b0.3552
Dietary carotene, mg/day	4.42±3.98	4.67±4.75	b0.5037
Dietary vitamin E, mg/day	15.6±8.16	14.2±8.17	b0.4945
Dietary vitamin B1, mg/day	0.93±0.29	0.88±0.25	b0,3865
Dietary vitamin B2, mg/day	1.45±1.06	1.16±0.43	b0.1503
Dietary vitamin B6, mg/day	1.25±0.51	1.17±0.38	b0.6580
Dietary folate, µg/day	339.7±172.1	308.6±130.1	b0,2877
Dietary vitamin C, mg/day	142.9±99.5	149.5±106.3	b0.7111
Dietary sodium, mg/day	3497±1296	3395±1075	b0.9962
Dietary potassium, mg/day	2651±821.6	2519±839	b0.3288
Dietary calcium, mg/day	798.9±248.0	775.2±233.7	b0.5605
Dietary magnesium, mg/day	302.5±100.8	284.3±90.7	b0.2834
Dietary phosphorus, mg/day	1051±310.9	983.9±253.5	b0.4162
Dietary iron, mg/day	11.26±4.75	9.66±3.08	b0.1410
Dietary zinc, mg/day	9.96±3.54	8.49±2.33	b0.0767

a Unpaired t test, b Mann-Whitney Test, N: Number of the patients

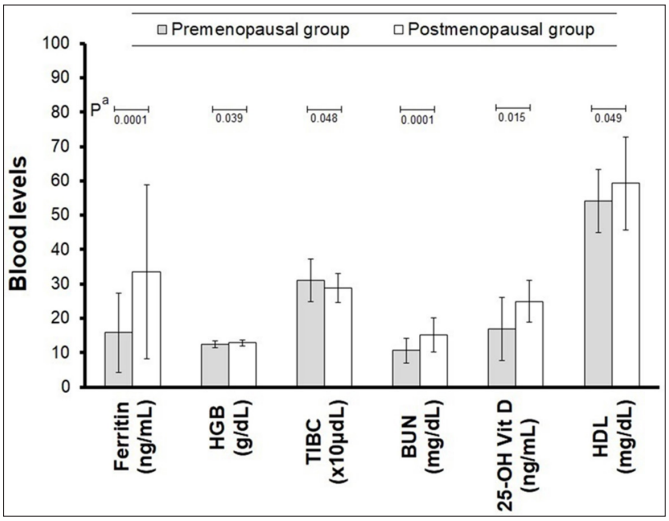

Figure. Ferritin, HGB, TIBC, BUN, 25-OH Vit D and HDL levels of premenopausal and postmenopausal women. The differences between the two groups in terms of parameters are seen clearly in the figure.

The premenopausal women who participated in our study were taller and this finding was parallel to the national data. Furthermore, these findings are consistent with data indicating that Turkey has increased the average height as an indicator of better nutrition in the younger population (13).

When the groups are examined in terms of anemia status in our study, this situation was higher in premenopausal women. The most likely reason for this difference is iron deficiency anemia due to menstrual bleeding in the premenopausal period (14). Nutritional anemia may be associated with prolonged inadequate intake of folate, vitamin B12, iron, protein and vitamin C. Although it was reported that older women after menopause may be at high risk in terms of insufficient micronutrient intake (15), this study shows that losses due to the menstrual cycle are more prominent in women. In addition, the lower levels of ferritin, TIBC and Hgb in premenopausal women also supports our view.

In a study conducted by Schwarz et al. (16) the proportion of premenopausal women with one or more chronic diseases was 29.2% while this rate for postmenopausal women was 13.1%. These rates were found to be 16.6% and 24.2% in premenopausal and postmenopausal women with three or more chronic diseases, respectively. These findings are similar to the results of our study in terms of the presence of more than one chronic disease. The probable reason for this finding is that postmenopausal women have a higher risk of developing chronic diseases due to the adverse metabolic consequences of both aging and menopause (17).

Although BUN is often used as an indicator of renal function and/or hydration status, it is also known to be an independent predictor of mortality in a large number of clinical settings and patient populations (18). In our study, unlike creatinine levels, postmenopausal women had higher BUN levels compared to the premenopausal group. This finding is thought to arise due to aging. That is, the total number of nephrons in a normal person gradually decreases with aging and diseases. Due to these losses, blood creatinine and BUN levels can be higher in the postmenopausal period (19). In our study, since creatinine levels were similar in both groups, the BUN levels of women in the postmenopausal group were attributed to the use of antihypertensive diuretic drugs rather than nephron loss. The presence of a history of hypertension in a significant portion of women in the postmenopausal group supports this conclusion because like creatinine, urea freely filters through the kidney glomeruli. However, compared to creatinine, urea can undergo substantial tubular reabsorption. This tubular reabsorption of urea may increase due to neurohormonal activation through direct effects on the distal nephron or indirect effects of water reabsorption due to reduced renal blood flow (20,21). Neurohormonal activation induced by some anti-diuretics, such as loop diuretics, will also reduce BUN clearance. This explains why serum BUN levels may be higher in people using diuretics.

Today, HDL is known to increase due to physical activity. Therefore, HDL levels are expected to be low in postmenopausal women, where we expect less physical activity. On the contrary, the fact that HDL levels of postmenopausal women were significantly higher in our study was attributed to the antihyperlipidemic drugs used by postmenopausal women to relieve cardiovascular complications. Moreover, the finding that postmenopausal women are highly hypertensive confirms our claim. Studies reporting that physical activity and HDL levels decrease with aging (22) and the lack of difference in lipid profile in both groups other than HDL also support our claim. In addition, it is reported that estrogen is very effective on blood lipids and decreases LDL while increasing HDL. After menopause, the protective effect of estrogen disappears and causes an increase in LDL and triglyceride levels and this situation negatively affects HDL levels. Moreover, the deterioration of HDL/LDL ratio is an important risk factor for cardiovascular diseases. All this information is evidence that postmenopausal women in our study may have used antihyperlipidemic drugs to reduce their cardiovascular risk. Factors in the development of post-menopausal cardiovascular diseases include not only the estrogen hormone, but also dietary habits of pre-menopausal women, obesity, and smoking (23,24).

The correlation between the development of menopause and impaired lipid metabolism leads to the emergence of obesity-related disorders, including metabolic syndrome. Therefore, in order to protect cellular structures from oxidative stress caused by estrogen deficiency, it is important for women who have entered menopause to eat adequate and balanced nutrition from antioxidative foods (25). In a recent cross-sectional study, postmenopausal women diagnosed with metabolic syndrome had higher plasma HDL cholesterol levels. On the other hand, the proportion of women with low HDL levels was higher in the premenopausal group. Therefore, it is thought that low HDL level may be the main characteristic finding of metabolic syndrome in postmenopausal women (26). In addition, in a study examining the lipid profile of healthy premenopausal and postmenopausal women (27), postmenopausal women had higher levels of total cholesterol, triglyceride, LDL and HDL.

According to data from the Turkish Nutrition and Health Survey (TNHS), mean AST level in women aged 31-50 years was 18.3 IU/L and mean ALT level was 17.5 IU/L. Mean AST level in the 51-64 age group was 21.5 IU/L and mean ALT level was 22,2 IU/L (28). In our study, AST values of the participants in the premenopausal group were lower than those in the postmenopausal group, but were similar to the results of the above study. We attributed the probable reason for the lack of difference

between the groups as being due to the liver function tests of women changing significantly during the transition to menopause. This idea is confirmed by a recent study in which an increase in AST and ALT levels associated with triglyceride was found in postmenopausal women (29). As it is known, sedentary lifestyle and decreased physical activity with aging is characterized by fattening. This fattening is also observed in internal organs such as the liver. Fatty liver usually manifests itself with ALT elevation, and in some cases, elevated AST accompanies this (30).

According to TNHS data 28 in women between the ages of 31-50, mean serum iron level was 71.7 µg/dL, serum TIBC was 332.19 µg/dL, mean serum ferritin level was 26.6 ng/mL, blood mean hemoglobin level was 12.7 g/dL and hematocrit value was 38.9%. These values were 76.0 µg/dL, 315.7 µg/dL, 55.9 ng/mL, 13.2 g/dL and 40.3%, respectively, in women between the ages of 51-64. Compared to these results, our ferritin levels were found to be lower in premenopausal women. We think that this finding occurs due to menstrual bleeding in premenopausal women. Moreover, serum iron levels were heavily affected by daily dietary changes. Studies reported that people with iron deficiency develop anemia only in advanced stages and that it can be reflected in hemoglobin and hematocrit levels due to the depletion of ferritin stores (31). In addition, TIBC was found to accompany this tableau in inverse proportion to serum ferritin levels (31). On the other hand, as iron loss will disappear with the end of menstrual bleeding in the postmenopausal period, body iron stores will be filled, and ferritin level will be higher (32,33).

According to the TNSH data, the vitamin D levels of women between the ages of 28, 31-50 and 51-64 years are 15.9 ng/mL and 17.3 ng/mL, respectively. These values were similar to the findings in our study. However, it was higher in postmenopausal women who could benefit less from daylight because they were not in an active life period. However, some researchers (34), contrary to our results, found higher serum vitamin D levels in women in the premenopausal period. They found that vitamin D levels were lower especially in those who had dark skin, were overweight and elderly (35). Therefore, they recommended special diets and vitamin supplements to increase low serum vitamin D levels. The main reason why we found a different result from these researchers may be dietary. In addition, vitamin D level is determined by measuring 25-OH vitamin D, which is a prohormone. Because 25-OH vitamin D is the most stable and abundant form of vitamin D in serum due to its half-life of 3 weeks, using this metabolite is the most reliable method in measurements. For the diagnosis of vitamin D insufficiency, 30 ng /ml value is used as the cut-off value of serum 25-OH vitamin D level (36). In another study, it was revealed that the serum 25-OH vitamin D level should be below 20 ng/mL in order to meet vitamin D deficiency (37). Vitamin D deficiency is a common finding accompanying obesity, increasing age, and unhealthy lifestyle. There are studies that show that adequate vitamin D level can be beneficial for bone, cardiovascular and general health, especially in women in the postmenopausal group (38). In light of the above information and our results, premenopausal women should take supplements for vitamin D.

It was reported that leukocytes decrease due to aging of bone marrow and decreases in its activity (39). Similarly, in our study, the WBC value of postmenopausal women was found to be lower compared to women in the premenopausal group. On the other hand, no difference was found between the daily zinc intake of women in the premenopause and postmenopausal groups. However, all women should be supported in dietary terms for iron and zinc (40).

CONCLUSION

Obese women in premenopause and postmenopausal periods should obtain adequate and balanced nutrition in accordance with their ages and conditions and their physical activity levels should be increased in order to increase their quality of life and protect their health. It should also be considered that the premenopausal group of obese women should take supplements in terms of vitamin D and iron.

ETHICAL DECLARATIONS

Ethics Committee Approval: Approval for the study was granted by the Ethics Committee of the University of Health Sciences Turkey, Hamidiye Scientific Research (Date: 29.03.2019, Session No: 2019/3, Decision No: 19/33). This study was conducted with the approval (Date: 26/06/2019 6028, Decision No: 16867222-604-01-01) of the Republic of Turkey Ministry of Health Research Platform.

Informed Consent: "Informed Volunteer Consent" was obtained from the women participating in the study.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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