The Effect of Hormone Replacement Therapy (HRT) on Body Mass Index Who Women Taking Therapy For The First 6 Months

Hormon Replasman Tedavisinin İlk Altı Ayda Kadınların Beden Kitle İndeksi Üzerine Etkisi

(Araştırma)

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ABSTRACT

Aim: To examine the effect of HRT on Body Mass Index (BMI) who women taking therapy for the first 6 months.
Method: The sample were composed 238 women who attend a menopause clinic. The data were collected at the beginning and in the 3rd and 6th months of therapy. Data were analysed using chi-square test and variance analysis in repeated measures.
Results: 19.3%of women were illiterate, 60.5%were literate/primary school graduates, and 20.2%were middle school or higher graduates. The mean BMI values of the women were 30.46 ±4.77 ($p > 0.05$) at the beginning of the therapy. The 3rd month follow-up was completed with 217 and the 6th month follow-up with 206 women. The women's mean BMI did not change over time ($p > 0.05$) as statistically.
Conclucions: HRT didn't effect on BMI of women's for the first 6 months of therapy. It is recommended that studies being conducted to examine a longer-term effect of HRT on BMI.

Key Words: *Hormone replacement therapy, menopause, body mass index (BMI).*

ÖZET

Amaç: HRT (Hormon Replasman Tedavisi) nin, tedavinin ilk altı ayında BKI (Beden Kitle İndeksi) üzerine etkisinin incelenmesi.
Yöntem: Örneklem bir menopoz polikliniğine başvuran 238 kadından oluşmaktadır. Veriler tedavinin başlangıcında, 3. ve 6. ayında toplanmış, Ki Kare ve Tekrarlı Ölçümlerde Varyans analizi testleri ile değerlendirilmiştir.
Bulgular: Kadınların %9.3'ünün okur-yazar olmadığı, %60.5'nün okuryazar yada ilkokoul mezunu olduğu ve %20.2'nin orta okul ve üzeri öğrenim gördüğü saptanmıştır. Kadınların tedavi başlandığı sırada ortalama BKI değeri 30.46 ±4.77 ($p > 0.05$) olarak hesaplanmıştır. Araştırma 3. ay izleminde toplam 217, 6. ay izleminde ise 206 kadınla tamamlanmıştır. Yapılan istatistiksel değerlendirme sonucunda kadınların BKİ ortalamalarının zaman içinde değişmediği belirlenmiştir ($p > 0.05$).
Sonuç: HRT, tedavinin ilk 6 ayında kadınların BKI'ni değiştiren bir etki göstermemektedir. Tedavinin BKI üzerine etkisinin daha uzun süreli tedavi sonucunda değerlendirileceği benzer çalışmaların yapılması önerilmiştir.

Anahtar Kelimeler: *Hormone replasman tedavisi, menapoz, beden kitle indeksi (BKI)*

Introduction

As the length of women's lives grows longer, so does one of their periods of life, the menopausal period. Having a healthy life in the postmenopausal period has become an important topic of discussion. This group of women make up a large section of the population and this number continues to grow. It is estimated that the number of women over 50 years old in the US in 2020 will be 20 million (1,2). Akkuzu and Akın mentioned that there were 4.3 million women 49 years old and older in 1990 in Turkey (7.9%of the population) (3). According to the Turkish Population and Health Survey statistics for 1998, 45-64 year old women made up 12.2% of the population and 65 years and older women were 5.9% of the population (4). The average age for menopause in our country is 48 years (5). In the US a mean of 34%of women and in our country 24%of women are in the period of menopause (1,3).

Together with menopause come many physical and emotional changes due to the lack of estrogen production from the ovaries. Although the results of the Women's Health Initiative (WHI) study published in the July, 2002, issue of JAMA have created contradictions for women and health care personnel (5,6,8), it supports the importance of HRT as the most effective choice currently for decreasing vasomotor and urogenital symptoms and for protecting against osteoporosis (5,7,9,10). The goal of HRT is to improve the quality of life of women in the menopausal and postmenopausal periods (11,12). Research studies have emphasized that HRT has a particular effect on preventing menopausal complaints and improving quality of life (13). The expected increase in women's lifespan and the negative effect of menopausal complaints and health problems that worsen in menopause on quality of life and length of life make therapy in the menopausal period unavoidable (14). An issue under discussion currently is the length of time to continue HRT. To see its protective effect, however, the mean length of time for use is 3-5 years or longer, according to the indication for HRT and the woman's risk factors (3,15).

Cross-sectional studies have shown that BMI in the middle-aged women increases in the period of the menopause transition (16,17). There were inconsistent evidence on weight changes during menopausal years (17). Results of longitudinal studies, have been more consistent, showing increases in weight associated with age but not with menopause (18). Results regarding weight change and use of HRT are mixed (17). Because weight increase attributed to hormone replacement therapy. Also, the impact of HRT on weight increases was studied as one of the causes of women stopping this treatment (16). In an editorial paper mentioned by Santoro, HRT did not seem to be associated with greater weight gain than non-use. Although many women believe that noncontraceptive estrogen therapy causes weight gain, results from clinical trials and epidemiological studies indicate that the impact of postmenopausal HRT on body weight and girths, if any, is to slightly decrease the rate of age-related increases (22).

Methods

Aim and Design: The purpose of this study was to examine the effect of HRT on BMI who women taking therapy for the first 6 months. This manuscript was based on a doctoral dissertation that was aimed to investigate the effect of HRT education and counseling services on compliance with therapy for women who were starting HRT for the first time. For this reason the findings and results were separated into experimental and control groups in this article. We used an experimental design, assigning women to counseling services or control groups in the thesis study. The data in this article were examined within the scope of a descriptive design. All the women who came to the study clinic to begin HRT for the first time within one year were counted for a total of 884 women. Because the study time frame was limited the sample size was determined considering the time limitations. The sample was made up of 119 experimental subjects between the dates of May 5, 2002, and August 5, 2002, and 119 control subjects between the dates of August 6, 2002, and February 6, 2003. To prevent contamination from the study's control group, first the women were chosen for the experimental group, then the women for the control group were chosen. For that reason randomization was not done.

The sample selection criteria were: to be in natural menopause, younger than 55 years old, and willing to come back to the same clinic at the 3rd and 6th months. Similarity between experimental and control groups was ensured using one-to-one pairing for educational level, age, and stage of menopause. We completed the 3rd month follow-up with 110 experimental and 107 control group women and the 6th month follow-up was completed with 109 (E) and 97 (C) women.

The research was conducted at the Government Insurance Maternity and Women's Health Teaching Hospital's Menopause Outpatient Clinic. All of the women who are followed in this outpatient clinic live in Ankara Municipality and benefit from this clinic that is affiliated with the public social insurance system. For this reason it was assumed that they have many similar sociocultural characteristics. In clinic procedures the women are required to come once every 3 months to have their HRT prescription renewed. For this reason monitoring was planned for when the women returned to the clinic. The outpatient clinic sees a high number of patients every day and planned education and counseling services are not provided.

Data Collection and Background: The women in the dissertation research study experimental group were given education and counseling about continuing with HRT,

the control group women were not given education. The content of the educational class to the experimental group was based on the HRT and related menopausal information that include the management of the body weigth. Before the women who were planning to begin HRT left the clinic verbal permission was obtained and the questionnaire form was filled in. They were given the date of their next appointment verbally and in writing and they were informed that they would be contacted by the researcher a few days before that date to remind them to come. The sociodemographic, descriptive and HRT-menopause related research data for each group were collected by follow-up form in the education room after the women were selected by sampling. The monitoring related data when the women returned to the clinic were also collected in the education room by a follow-up form. They were reminded of their return appointments and that they were expected for data collection by the researcher. At the 3rd and 6th month the experimental group women were given at least a 10-minute counseling session based on their needs.

Body height and weight measurements were made at the time the first prescription for HRT was written after a questionnarie form was completed by the researcher. These measurements were made using the same meter tool and scales by the researcher herself and BMI were determined. The measurements were recorded on a monitoring form. Data were analysed using the Statistical Package for Social Sciences for Windows 11.0. Percentages were calculated and Chi-squared test and variance analysis in repeated measures were used. Pearson chi-square value, likelihood ratio chi-square value and Fisher's exact chi-square test value were used to evaluate the data. Variance Analysis at Repeated Measurements tests were used to compare the BMI mean values for the women at the start of therapy, and at the 3rd and 6th months. A level of $p < 0.05$ was considered statistically significant.

HRT Type and Dose and Ethical Considerations: The researcher didn't intervene in any decision about prescription of HRT. The prescription of HRT type and dose was determined by the physicians at the outpatient clinic according to normal required procedures. The educational intervention, selection of women to the sample and data collection were performed after prescriptions were given.

We received written permission from the Hospital's Educational and Ethical Board (Date: 4.26.2002, No:8). We received verbal permission from the women. The women were informed that at the end of the 6 months monitoring the normal clinic process would continue. In clinic procedures the women are required to come once every 3 months to have their HRT prescription renewed. For this reason, monitoring did not add any additional financial burden or any added responsibility to the women. When the women in the control group wanted information about HRT, they asked the clinic personnel following normal clinic procedures.

Results

The age characteristics of the women in the study were: 5.9%were 39 years old or younger, 5.9%were in the 40-44 year group, 32.8%were in the 45-49 year group and 55.5%were 50 and older. There were 14 menopausal women who were less than 40 years old. The mean age was determined to be 49.34 ±5.06. The educational levels of the women were: 19.3%were illiterate, 60.5%were literate/primary school graduates, and 20.2%were middle school or higher graduates. 20.2%of the women were in the premenopause phase, 28.6%were in the menopause phase and 51.3%were in the postmenopause phase.

Table 1- A. Distribution of Some of the Women's Characteristics in the Experimental and Control Groups *

Fertility Characteristics	Groups						P
	Experimental Group		Control Group		Total		
	N	%	N	%	N	%	
Age at Menarche**	**n = 119**		**n = 119**		**n = 238**		
10-12	23	19.3	20	16.8	43	18.1	
13	36	30.3	16	13.4	52	21.8	
14 +	40	33.6	34	28.6	74	31.1	<0.001§
Can't remember	20	16.8	49	41.2	69	29.0	
Number of pregnancies	**n = 115***		**n = 119**		**n = 234**		
0	4	3.5	3	2.5	7	3.0	
1	1	0.9	4	3.4	5	2.1	
2	12	10.4	9	7.6	21	9.0	0.887 ¶
3	18	15.7	16	3.4	34	14.5	
4 +	80	69.5	87	73.1	167	71.4	
Number of deliveries	**n = 115***		**n = 119**		**n = 227**		
0	4	3.5	3	2.5	7	3.0	
1	3	2.6	5	4.2	8	3.0	
2	33	28.7	30	25.2	63	26.9	0.491 ¶
3	34	29.6	32	26.9	66	28.2	
4 +	41	35.7	49	41.2	90	38.5	
Number of living children	**n = 115***		**n = 119**		**n = 227**		
0	4	3.5	4	3.4	8	3.4	
1	3	2.6	5	4.2	8	3.4	
2	35	30.4	36	30.3	71	30.3	0.449 ¶
3	39	33.9	37	31.1	76	32.5	
4 +	34	29.6	37	31.1	71	30.3	
Number of stillbirths	**n = 115***		**n = 119**		**n = 227**		
0	105	91.3	105	87.9	210	89.7	
1	4	3.5	11	9.2	15	6.4	0.114 ¶
2 +	6	5.2	3	2.5	9	3.8	
Number of miscarriages	**n = 115***		**n = 119**		**n = 227**		
0	93	80.9	93	78.2	186	79.5	
1	13	11.3	21	17.6	34	14.5	0.228 §
2 +	9	7.8	5	4.2	14	6.0	
Number of voluntary abortions	**n = 115***		**n = 119**		**n = 227**		
0	34	29.6	49	41.2	83	35.5	
1	33	28.7	20	16.8	53	22.6	0.053 §
2 ve üzeri	48	41.7	50	42.0	98	41.92	
Cigarette Smoking Status	**n = 119**		**n = 119**		**n = 238**		
Never smoked	87	73.1	96	80.7	183	76.9	
Quit smoking	20	8.4	4	3.4	14	5.9	0.004
Still smoking	22	18.5	19	16.0	41	17.2	§

* 4 single women were not included in this total.
** Mean: 13.4, min:10, max: 20.
¶ Likelihood ratio chi-square value.
§ Pearson Chi-square test value.

There was no difference between the groups at the 3rd month for those who were continuing HT ($p > 0.05$), but at the 6th month a significant difference was found ($p < 0.05$). The primary reason for stopping HT at the 3rd month in the experimental group was fear of cancer and in the control group it was the side effects of HT. At 6 months the primary reason for stopping HT in the experimental group was, again, fear of cancer but in the control group it was the woman's desire not to continue. There was no significant difference in the groups at either 3 or 6 months in experiencing benefits or side effects from HT ($p > 0.05$). [Please see the following reference detailed information related these findings: Akkuzu G., Eroğlu K., "The Effect of Education and Counseling Services on Compliance to Therapy of Women Taking Hormone Therapy (HT) for The First Time; Menopause, (12):6, 763-773 (2005).]

Table 1. B. Distribution by Experimental and Control Group of Women's Body Mass Index (BMI) at First Visit to Menopause Clinic

BMI	Groups					
	Experimental Group		Control Group		Total	
	N	%	N	%	N	%
Normal	10	8.4	16	13.4	26	10.9
Mildly obese	52	43.7	40	33.6	92	38.7
1st degree obese	40	33.9	42	35.3	82	34.5
2nd degree obese	14	11.8	18	15.1	32	13.4
Morbidly obese	3	2.5	3	2.5	6	2.5
Total	119	100.0	119	100.0	238	100.0

$X = 3.499$, $p = 0.478$

Mean of BMI: E: 29.77 ±4.22
C: 31.54 ±5.39
T: 30.46 ±4.77

In the statistical evaluation of the fertility characteristics there was a statistically significant difference between groups for age of menarche ($p < 0.001$) and for number of voluntary abortions ($p < 0.05$); however there was no statistically significant difference between groups for number of pregnancies, number of births, number of living children, number of stillbirths, and number of miscarriages ($p > 0.05$). 17.2%of the women were currently cigarette smokers ($p < 0.05$) (Table 1.A.), and the mean BMI values were 30.46 ±4.77 ($p > 0.05$) (Table 1. B.).

The distribution of the women's BMI means at their first visit to the menopause clinic, and at the 3rd and 6th months after beginning HRT are shown in Table 2. As a result of statistical analysis the changes in the women's mean BMI over time from the first clinic visit to the 3rd and 6th month were not found to be significant ($p > 0.05$). However the changes over time in the BMI of the women in the groups were not parallel ($p < 0.05$). There was a decrease in the experimental group women's BMI over time and an increase in the control group women, and the difference between groups was statistically significant ($p < 0.05$).

Table 2. Distribution of Body Mass Index Means for Women When First Seen in the Menopause Clinic, and at the 3rd and 6th months after Beginning HRT

Groups	BKI* Means			
	n	X ±SS	Minumum	Maksimum
First Seen				
Experimental	63	29.77 ±4.22	19.02	39.80
Control	41	31.54 ±5.39	20.83	43.29
Total	104	30.46 ±4.77	19.02	43.29
3rd Months				
Experimental	63	29.82 ±4.39	17.53	42.51
Control	41	31.81 ±4.87	21.29	42.85
Total	104	30.61 ±4.66	17.53	42.85
6th Months				
Experimental	63	29.32 ±4.10	19.40	39.55
Control	41	32.40 ±5.35	20.83	46.75
Total	104	30.54 ±4.85	19.40	46.75

*** Body Mass Index**

Variance Analysis at Repeated Measurements - Statistical Values	Change Over Time in BMI Means	Change Over Time in Groups' BMI Means (in parallel)	Difference Between Groups in Change in BMI Means over Time
F	0.491	4.92	6.47
p	0.58	0.012	0.012

In this study, 69.1%of the experimental group women and 71.0%of the control group women were continuing with HRT at the 3rd month (p >0.05). At the 6th month 56.9%of the experimental group women and 42.3%of the control group women were continuing with HRT. The difference between the two groups for continuation of HRT at the 6th month was significant (p <0.05).

Table 3. Distribution of Women's BMI and Status of Continuation of HRT

Groups / BMI			Continuation Status				Total	
			Continuing		Not continuing			
			N	%	N	%	N	%
3rd Moth 6. Ay	Experimental		n = 76		n = 22		n = 98	
		Normal	7	87.5	1	12.5	8	100.0
		Obese	32	72.7	12	27.3	44	100.0
		Morbidly obese	37	80.4	9	19.6	46	100.0
	Control		n = 76		n = 31		n = 107	
		Normal	7	58.3	5	41.7	12	100.0
		Obese	25	67.6	12	32.4	37	100.0
		Morbidly obese	44	75.9	14	24.1	58	100.0
6th Month	Experimental		n = 62		n = 13		n = 75	
		Normal	6	85.7	1	14.3	7	100.0
		Obese	27	84.4	5	15.6	32	100.0
		Morbidly obese	29	80.6	7	19.4	36	100.0
	Control		n = 41		n = 25		n = 66	
		Normal	4	80.0	1	20.	5	100.0
		Obese	13	59.1	9	40.9	22	100.0
		Morbidly obese	24	61.5	15	38.5	39	100.0

3th Month E: X2 = 1.307, p = 0.520; C: X2 = 1.771, p = 0.413
6 th Month E: X2 = 0.223, p = 0.894; C: X2 = 0.837, p = 0.658

The distribution of the women's BMI and status of continuation with HRT is shown in Table 3. At the 3rd month 87.5%of the experimental group women who were continuing with HRT had "normal" BMI values and 75.9%of the control group women who were continuing had "morbidly obese" BMI values. At the 6th month in both groups the percentage of women with "normal" BMI values who were continuing with HRT was higher (85.7%of the experimental and 80.0%of the control). As a result of statistical evaluation in this study no relationship was found in the experimental and control groups between the BMI and status of continuation of HRT at 3rd and 6th months (p >0.05).

Discussion

Although there are many articles in the literature that make clear the importance of education and counseling for increasing compliance with HT (8,10,14,21), there are fewer which show the effect of education and counseling on compliance with therapy (1). In Turkey, however, very few studies have been conducted on the subject of compliance with HT (26,27) and none of these studies involved monitoring to examine the effect of education and counseling services. According to results of this study support for HT therapy in the 3rd and 6th months can be ensured with effective counseling for the women. In the institutions where HT is given it would be beneficial to establish a service model in which education and counseling service is offered by nurses.

Although there is widespread belief that HRT leads to weight gain, and increase in BMI as a result, no relationship has been found between HRT and weight gain in many studies (16,17,20-22). Başer determined that women do not have a weight gain from their pre-HRT weight to their weights at 4th week of HRT and 12th week of HRT (12). Berker, Erkmen and Cengiz determined that there is no statistically significant difference between BMI means of postmenopausal women who have used HRT for the last 6 months and women who do not use HRT (28). In another research study women who used HRT for 3 years, compared to those who did not, were found to weigh 1 kg less, and to have had smaller increases in their waist and hip measurements (17). In another study the increase in weight of women in the 40-59 year old age group who used HRT, who had used and quit and who had not used HRT was shown to be related to an increase in age (16). In the results of a study by Crawford, Casey, Avis and McKinlay change in women's BMI was not found to be related to menopause and HRT but to their health behaviors, such as exercising and smoking cigarettes (16). The results of this study as well do not show an effect of HRT on BMI. Although the decrease in mean BMI over time in the experimental group was not statistically significant, the education and counseling given to this group on the relationship between hormone therapy and weight gain may have had an effect.

Although no agreement has been reached on whether or not HRT has an effect on weight gain and BMI, the belief that HRT causes weight gain is widespread among women studies (16,17,20-22). In some studies it has been determined that this belief was an obstacle to their continuation of HRT (23,24). In Denmark women with a BMI of 25 or less, compared to women with higher BMI values, continued HRT for a longer period of time (25). In another study women with high BMI values were shown to have poorer adaptation to HRT (15). In a study conducted in Sweden it was found that women who used HRT in all age groups had lower BMI than those who did not use HRT (26). In this study, considering the finding that weight gain was a cause for not continuing HRT for 5 women (3 experimental and 2 control group women) at the 3rd month and one from each group at the 6th month, it can be said that continuation did not have an effect on BMI. However a factor affecting this result may be that there were more women in this study in the BMI obese and morbidly obese groups.

Conclusions

The results of this study showed that there was no relationship between BMI and HRT in the first 6 months of therapy. No difference was shown between BMI change both in the groups, BMI did not have an effect on continuation of HRT. In addition the decreasing trend in BMI in the experimental group supports this opinion.

It is believed that these results have a significant place in the discussions about factors that affect weight gain in women in the menopausal period. It is recommended that similar studies be performed to compare with this study. We also recommend that studies be conducted to examine a longer-term effect of a HRT on BMI.

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