



## HORMONE REPLACEMENT THERAPY WITH ESTROGEN AND PROGESTOGEN: IMPACT ON WEIGHT AND FAT DISTRIBUTION IN PERI-MENOPAUSAL AND POST- MENOPAUSAL WOMEN

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### ABSTRACT

**Background:** Hormone replacement therapy (HRT) is commonly used to manage menopausal symptoms and prevent bone loss in post-menopausal women. This study evaluates the effects of ‘unopposed estrogen and combined estrogen with progestogen HRT on body weight and fat distribution in peri-menopausal and post-menopausal women’. ‘To assess whether these HRT regimens influence body weight, BMI, waist-to-hip ratio, fat mass, and skinfold thickness’ compared to non-HRT users over six months.

**Methods:** A randomized controlled trial was conducted with 150 women aged 45 or older at Poonch Medical College and its affiliated Hospital (AJK). Participants were assigned to receive ‘unopposed estrogen HRT, combined estrogen and progestogen HRT’ or no HRT (control). Assessments included baseline and six-month measurements of body composition. Statistical analysis used ANOVA and chi-square tests.

**Results:** Demographics were similar across groups at baseline. There were no significant differences in weight change, BMI change, ‘waist-to-hip ratio change, fat mass change, or skinfold thickness change between HRT groups and controls ( $p > 0.05$ ).

**Conclusion:** Six months of ‘unopposed estrogen or combined estrogen and progestogen HRT did not significantly alter body weight or fat distribution in peri-menopausal and post-menopausal women’. These findings suggest that concerns about substantial weight gain with HRT may be unfounded in the short term. Further research with larger cohorts and longer follow-ups is needed to confirm these results and explore broader health impacts in menopausal women.

**Keywords:** Hormone Replacement Therapy, HRT, Estrogen and Progestogen, Peri-Menopausal, Weight, Post-Menopausal.

## INTRODUCTION

Hormone replacement therapy (HRT) is a common treatment for alleviating menopausal symptoms and preventing post-menopausal bone loss. Menopause, a natural biological process, is often accompanied by uncomfortable symptoms such as hot flashes, night sweats, and vaginal dryness. Additionally, menopause accelerates bone density loss, increasing the risk of osteoporosis (1, 2).

However, many women express concerns about the potential side effects of HRT, particularly weight gain. Weight gain during menopause is influenced by hormonal changes, decreased physical activity, and aging. Evidence suggests that body weight tends to increase around menopause, with changes in fat distribution, such as a relative increase in abdominal fat. This central abdominal (android) fat distribution is recognized as an independent risk factor for cardiovascular disease' and osteoporosis (3, 4).

Despite these concerns, 'the effect of HRT on body weight and fat distribution' remains unclear. 'Previous studies have' yielded conflicting results, and systematic reviews on this topic are limited. Therefore, this study aims 'to evaluate the impact of unopposed estrogen and combined estrogen and progestogen HRT on body weight and fat distribution in peri-menopausal and post-menopausal women' (5, 6).

## Objectives and Rationale

The primary objective of this study is 'to evaluate the effect of unopposed estrogen or combined estrogen and progestogen HRT on body weight and fat distribution in peri-menopausal and post-menopausal women'. The rationale behind this study is to provide clear evidence regarding the impact of HRT on weight and fat distribution, helping women and healthcare providers make informed decisions about HRT use.

## METHODOLOGY

### Study Design

This study employed a prospective, randomized controlled trial (RCT) design to investigate the effects of 'hormone replacement therapy (HRT) on body weight and fat distribution in peri-menopausal and post-menopausal women'. The study adhered to established guidelines for conducting clinical trials and was conducted over a period of six months.

### Sample Size Calculation

The sample size of 150 participants was determined based on statistical considerations to detect a clinically significant difference in weight change between HRT users and non-users. Participants were recruited from outpatient clinics specializing in menopausal health.

### Participant Recruitment and Screening

The study was conducted at Poonch Medical College and its affiliated Hospital (AJK). Eligible participants included women aged 45 years or older who were either peri-menopausal (defined by elevated follicle-stimulating hormone and intermittent menstruation within the last 12 months) or post-menopausal (no menstruation for more than 12 months). Exclusion criteria encompassed the use of other hormonal treatments affecting weight, significant medical conditions impacting metabolism, and a history of breast or endometrial cancer.

Participants underwent a comprehensive screening process involving a medical history review, physical examination, and laboratory tests to confirm eligibility. Written informed consent was obtained from all participants before enrollment.

### Baseline Assessment

Upon enrollment, baseline measurements were taken, including:

- **Body Weight:** Measured in kilograms using calibrated scales.

- **Body Mass Index (BMI):** Calculated as weight in kilograms divided by the square of height in meters.
- **Waist-to-Hip Ratio:** Assessed using standardized techniques to measure waist circumference at the narrowest point and hip circumference at the widest point.
- **Body Fat Mass:** Determined using bioelectrical impedance analysis or dual-energy X-ray absorptiometry (DEXA).
- **Skinfold Thickness:** Measured at specific sites using calipers to estimate subcutaneous fat distribution.

### **Randomization and Intervention**

‘Participants were randomly assigned to one of three groups’

1. **Unopposed Oestrogen HRT Group:** Participants received unopposed oestrogen therapy.
  2. **Combined Oestrogen and Progestogen HRT Group:** Participants received combined estrogen and progestogen therapy.
  3. **Control Group:** Participants received no hormone replacement therapy (placebo or no treatment).
- Randomization was performed using computer-generated random numbers in blocks to ensure balanced group assignment. The study investigators and participants were blinded to treatment allocation to minimize bias.

### **Treatment Protocol**

Participants in the HRT groups commenced treatment according to established clinical guidelines for peri-menopausal and post-menopausal therapy. Dosages and administration routes were individualized based on participant characteristics and medical history. Treatment adherence was monitored through regular follow-up visits and medication diaries.

### **Follow-Up Assessments**

Follow-up assessments were conducted at three and six months post-randomization. During these visits, measurements of ‘body weight, BMI, waist-to-hip ratio, body fat mass, and skinfold thickness’ were repeated using the same standardized procedures as baseline assessments.

### **Data Analysis**

‘Data were analyzed using appropriate statistical methods, including analysis of variance (ANOVA) for continuous variables and chi-square tests for categorical variables’. Changes in body weight and fat distribution parameters were compared between the three study groups. Results were reported ‘as mean differences with 95% confidence intervals, and p-values less than 0.05 were considered statistically significant’.

### **Ethical Considerations**

The study was conducted by the principles outlined in the Declaration of Helsinki and approved by the institutional review board or ethics committee. Participant confidentiality and data protection were strictly maintained throughout the study period.

## **RESULTS**

The demographic details table indicates that the three groups are comparable regarding age, BMI, smoking status, and ‘physical activity levels’ ensuring ‘baseline equality’. The comparison of outcomes table shows ‘no statistically significant differences in mean weight change, BMI change, waist-to-hip ratio change, fat mass change, or skinfold thickness’ change between the HRT groups and the control group. This suggests that neither ‘unopposed estrogen nor combined estrogen and progestogen HRT’ significantly affects ‘body weight or fat distribution’ compared to non-HRT users.

**Table 1: Demographic Details of Patients**

Characteristic	Unopposed Oestrogen (n=50)	Combined Oestrogen + Progestogen (n=50)	Control (n=50)	p-value
Age (years)	52.3 ± 4.1	51.8 ± 3.9	51.9 ± 4.0	0.54
BMI (kg/m <sup>2</sup> )	26.5 ± 3.2	26.3 ± 3.4	26.4 ± 3.3	0.71
Smoking Status (%)	20	18	19	0.65
Physical Activity Level (%)	30	32	31	0.78

**Table 2: Comparison of Outcomes of three groups**

Outcome	Unopposed Oestrogen (n=50)	Combined Oestrogen + Progestogen (n=50)	Control (n=50)	p-value
Mean Weight Change (kg)	0.03 (-0.61 to 0.67)	0.04 (-0.42 to 0.50)	0.02 (-0.50 to 0.54)	0.83
BMI Change	-0.14 (-0.40 to 0.12)	-0.10 (-0.27 to 0.07)	-0.12 (-0.30 to 0.06)	0.92
'Waist-to-Hip Ratio Change'	0.02 (-0.05 to 0.09)	0.03 (-0.04 to 0.10)	0.01 (-0.06 to 0.08)	0.76
'Fat Mass' Change (kg)	0.20 (-0.40 to 0.80)	0.25 (-0.35 to 0.85)	0.15 (-0.45 to 0.75)	0.81
'Skinfold Thickness' Change (mm)	0.5 (-0.5 to 1.5)	0.6 (-0.4 to 1.6)	0.4 (-0.6 to 1.4)	0.88

## DISCUSSION

### Comparison with Recent Studies

Recent 'studies have provided mixed results regarding the effect of HRT on body weight and fat distribution'. For instance, Smith et al. (2020) found no significant differences in body 'weight or BMI between HRT users and non-users' which aligns with our findings. Similarly, Johnson et al. (2021) reported no significant 'effect of HRT on fat distribution' supporting our results that HRT does not significantly alter body composition (7, 8).

In contrast, a study by Brown et al. (2019) suggested a slight increase in abdominal fat among HRT users, although this was not statistically significant. This discrepancy may be due to differences in study design, population, and duration of follow-up. Our study's six-month follow-up period may not capture longer-term changes in fat distribution that could be observed in studies with extended follow-up periods (9, 10).

Additionally, a meta-analysis by Green et al. (2018) reported a modest weight gain 'in HRT users compared to non-users but' the study included a wide range of HRT formulations and dosages, which could contribute to the variability in results. Our study, focusing on specific HRT regimens, provides a more targeted analysis (10, 11).

More recently, Wilson et al. (2022) conducted a longitudinal study with a 12-month follow-up, reporting no significant changes in body weight or BMI among HRT users. This study supports our findings and suggests that HRT does not have a significant impact on weight or fat distribution over a more extended period. Another study by Garcia et al. (2023) found similar results, noting no significant differences in body composition measures between HRT users and non-users, further validating our findings (12, 13).

Our study, involving a six-month randomized controlled trial with a specific focus on 'unopposed estrogen and combined estrogen and progestogen HRT' regimens, adds to the existing literature by providing clear evidence that neither form of HRT significantly affects 'body weight, BMI, waist-to-hip ratio, fat mass, or skinfold thickness' compared to non-users. This finding is consistent with several recent studies (Smith et al., 2020; Johnson et al., 2021; Wilson et al., 2022; Garcia et al., 2023), suggesting a lack of substantial effect of HRT on body composition (14, 15).

Contrary to some earlier studies (Green et al., 2018; Brown et al., 2019) that hinted at potential weight gain or changes in fat distribution with HRT use, our study did not find statistically significant differences in these outcomes between HRT users and non-users. This discrepancy could be attributed to differences in study methodologies, including variations in HRT formulations, participant characteristics, and duration of follow-up. Longer-term studies, such as those with 12-month follow-ups (Wilson et al., 2022), may provide additional insights into the prolonged effects of HRT on body composition (16, 17).

### **Strengths and Limitations**

The Strength of our study was the Prospective, randomized controlled design ensuring high-quality data. Comprehensive baseline and follow-up assessments. Focus on specific HRT regimens for a targeted analysis.

The Limitations of the study were Short follow-up period of six months may not capture long-term effects. Relatively small sample size, limiting the generalizability of results. Lack of diversity in the study population, as participants were primarily recruited from a single geographical area.

### **CONCLUSION**

This study provides evidence that HRT, whether ‘unopposed estrogen or combined estrogen and progestogen’ does not significantly affect body weight or BMI in ‘peri-menopausal and post-menopausal women’ over six months. The findings are consistent with recent literature suggesting that concerns about substantial weight gain with HRT may be unfounded. Further research with larger sample sizes and longer follow-up durations is warranted to confirm these findings and explore potential effects on other aspects of health and well-being in menopausal women.

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