

## Effect of Aerobic Exercise on Body Fat Composition in Lactating Vs. Non Lactating Ladies

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**Abstract:** Exercise decreases the Excessive body fat and weight in women. This study was conducted to investigate the effect of exercise on non-lactating and lactating women. Forty women were chosen from outpatient clinic of Rabaa hospital in Cairo, their ages were between 25-35 years old and BMI 25- 30 kg/ m<sup>2</sup>. They were divided into two groups equal in number, group A (20 non lactating women received aerobic exercise) and group B (20 lactating women received the same exercise), they received aerobic exercise 3 times per week for 30 min. on treadmill for 4 weeks. Results in group A women were statistically significant with decrease in DEXA by 7.6 %, statistically significant decrease in BMI by 2.52% and statistically significant increase in prolactin by 3.8%. In group B significant decrease in DEXA by 2.7 %, in BMI by 8.2% and in prolactin increase by 2.79% were recorded. Conclusion; in non lactating group they showed decrease in fat more than lactating women and BMI decrease in lactating women more than non lactating.

**Key words:** DEXA • BMI • Aerobic Exercise and Prolactin Hormone

### INTRODUCTION

It has been nearly two decades since guidelines for how much weight a woman should gain during pregnancy were issued by the Institute of Medicine (IOM) [1]. In that time, more research has been conducted on the effects of weight gain in pregnancy on the health of both mother and baby. There have also been dramatic changes in the population of women having babies. American women are now a more diverse group they are having more twin and triplet pregnancies and they tend to be older when they become pregnant. Women today are also heavier; a greater percentage of them are entering pregnancy overweight or obese and many are gaining too much weight during pregnancy. Many of these changes carry the added burden of chronic disease, which can put the mother and her baby's health at risk [1].

During pregnancy, the body begins getting ready for the baby by storing fat. Most of this fat is stored during the early weeks of pregnancy. Some fat is stored in weeks 14 through 28. Almost no fat is stored during weeks 29 to 40. This extra fat is stored over back, abdomen and upper

thighs. Fat is stored opposite the growth rate of baby, which is minimal during the first half of pregnancy and rapid during the last half. Stored fat provides a reserve of calories for mother and baby to use in the last 10 to 12 weeks. Change in body composition during pregnancy can be estimated from knowledge of the composition of the products of conception, the alterations in the reproductive organs and blood volume of the mother [2]. After birth, the fat stores created during pregnancy are primed to be metabolized through lactation. Several investigators have explored the relation between duration of lactation and postpartum weight change and found a variety of outcomes. Overall, it has been observed that prolonged exclusivity of breastfeeding is associated with increased weight loss when controlling for gestational weight gain and postpartum caloric intake and expenditure [3].

Exercise during pregnancy has been shown to offer an array of positive outcomes for pregnant women, including decreased maternal weight gain and decreased body fat in the second half of gestation [4]. Exercise during pregnancy also improved oral glucose tolerance and reduced gestational diabetes risk [5, 6].

Regular exercise not only keeps our body fit but it also helps in maintaining our mind fresh for a longer period of time. Our mind will not feel tired if we do the regular exercises. It also increases the blood circulation of the body and prepares us for the hard work. Regular exercise also can prevent chronic diseases and other health problems related to lungs and heart. Regular exercises help to strengthen the heart. The muscle mass can increase and the weight can be controlled [7].

The aim of this work is evaluate the effect of aerobic exercise on body fat between lactating and non lactating females.

## MATERIALS AND METHODS

**Subjects:** Forty women participated in this study from Rabaa hospital outpatient in Cairo. Their ages ranged from 25-35 years old. These women were subdivided into two equal groups: group (A) consisting of 20 non-lactating women and group (B) consisting of 20 lactating women.

**Group A:** This group was composed of 20 non-lactating women who received the exercise program 3 times per week.

**Group (B):** This group was composed of 20 lactating women who received the exercise program 3 times per week.

### Instrumentation

#### For evaluation

**Weight-Height Scale:** It was used to measure weight and height for each female in both groups (A&B).

**Tape Measurement:** It was used to measure waist and hip circumferences for each female in both groups (A&B).

**Mercurial Sphygmomanometer:** It was used to measure blood pressure for each female in both groups (A&B).

**Syringes, Cotton and Alcohol:** They were used for collecting blood samples from each female in both groups (A&B) for prolactin hormone.

**Dual X- Ray Absorptiometry (DEXA):** It is the gold standard in Body Composition and Bone Density.

#### For Training

**Electronic Treadmill:** It was used 3 times/week for 30 min with 0 inclination.

**Stop Watch:** it was used to adjust the time for each exercise phase (Warming up, active phase and cooling down phase).

### Procedures of the Study

#### Procedures of Evaluation for Both Study Group (A&B)

**Assessment of Obesity for Each Mother Through:** Measuring weight and height of each mother to be used in calculation of initial BMI by weight and height scale, BMI was calculated according to the following equation: BMI = weight (kg) / height (m<sup>2</sup>) before and after 8 weeks.

**Measurement of Waist Circumference:** Start at the top of her hip bone and then bring the tape measure all the way around, level with her belly button (At level of umbilicus) and the reading was taken at the end of expiration.

**Dual X- Ray Absorptiometry (DXA):** On the day of the exam she might eat normally, objects such as keys or wallets that would be in the area being scanned should be removed and she was asked to remove some or all of her clothes and to wear a gown during the exam.

#### Procedures for Training

**Warm up Period:** 5 minutes in the form of jogging slowly to allow for gradual increase in heart rate and reduce the risk of injuries.

**Treadmill Program:** Females walked at a moderate pace for 5 minutes, then increase to fast walk for 20 min. at the end speed decreased for 5 min. The exercise program was performed 3times per week for 8 weeks.

**Cool down Period:** 5 minutes at the end of exercise session in form of light walk or gentle stretching.

## RESULTS

The current study was conducted on 40 females divided into two groups (Group A, 20 non lactating females) and (Group B, 20 lactating females). The statistical analysis and comparison of the data in our study were made by paired T-test within the group and unpaired T-test between both groups. The results between both groups there were statistically significant ( $p < 0.05$ ) in DEXA and prolactin hormone and statistically non-significant ( $p > 0.05$ ) in BMI.

Table 1: Comparison of fat content between Group A & Group B before and after the study:

Items	DEXA	
	Before	After
Group A	41.6±2.4	38.4±2.8
Group B	42.9±2.3	41.7±2.5
mean difference	1.25±3.6	3.25±3.8
t-value	1.535	3.789
Level of Significance (p-Value)	.141	.001*
Significance (p<0.05)	NS	S

NS: Non-Significant S: Significant

Table 2: Comparison of BMI between Group A & Group B before and after the study:

Items	BMI	
	Before	After
Group A	27.7±1.6	27.0±1.6
Group B	28±0.8	26.5±1.2
mean difference	0.32±1.9	0.5±2.1
t-value	-.718	1.036
Level of Significance (p-Value)	.481	.313
Significance (p<0.05)	NS	NS

NS: Non-Significant

Table 3: Comparison of Prolactin between Group A & Group B before and after the study:

Items	Prolactin	
	Before	After
Group A	10.5±1.2	10.9±1.2
Group B	28.6±4.3	29.4±1.6
mean difference	-18.1±2	18.47±2.2
t-value	-39.1	-37.255
Level of Significance (p-Value)	0.00*	0.00*
Significance (p<0.05)	S	S

S: Significant

## DISCUSSION

Researchers from the Cincinnati Children's Hospital Medical Center found that the loss of overall body fat occurred at a faster rate among women who did not breastfeed than among those who did. Researchers speculate that the non-breastfeeding women were restricting their calorie intake in the effort to lose weight, whereas breastfeeding women did not restrict calorie intake because they presumed they would lose weight by breastfeeding. Another possible reason for breastfeeding mothers not losing more fat than mothers who did not breastfeed may involve their increased levels of the hormone prolactin. Research shows that this hormone not only stimulates milk production early in lactation but also stimulates the appetite of breastfeeding women [8].

However, so many other factors that come into play when discussing anyone's metabolism of burn calories, but especially a woman during her postpartum period like: Lack of Sleep which a decrease in sleep, typical of just about every new mom, can cause metabolism to slow by causing a hormonal change that can interfere with your hunger signals, causing you to eat more than you actually needed, Stress which releases cortisol, slows metabolism and if you're also not sleeping much, the cortisol is not being removed from the body at night during restorative sleep. I think we can all agree that even if we are blissfully joyful, most new moms are also highly stressed, Less Active, More Eating. In the first few months postpartum, most moms are sitting with baby more and may have less time for regular activity while they adjust to a new routine (Even if they're working out). In addition, the increase in energy needs for milk production can make you feel ravenous, causing you to eat more than normal and possibly more than needed and Not Enough Eating which Some moms are so busy and overwhelmed in the first months of their baby's life or mistakenly think they need to cut calories severely to lose weight and don't eat nearly enough, which can cause the body to believe there is famine and actually store fat as an energy reserve [9].

These findings are in agreement with our results which have found decrease in percentage of body fat in lactating and non-lactating women who participate in exercise program but in lactating women the body fat loss is less than non-lactating.

The exercise should not only train the person for her activity but should also help the person maintain overall physical fitness and wellness. Body weight and composition may be maintained by pursuing an exercise regimen that matches a person's needs. The American College of Sports Medicine (recommends 30 minutes of exercise, to remain healthy [10].

These findings are in agreement with our results which have found that exercise decrease the body weight in lactating and non-lactating women and the decrease of weight in lactating women are more than non-lactating body.

Prolactin levels are generally heightened in women who are breastfeeding as compared to women who are not breastfeeding, although prolactin levels are proportionate to breastfeeding frequency and the infants milk demands [11].

Prolactin secretion is increased by exercise through increasing baseline secretion, increasing release of thyroid-releasing hormone and reducing the effects of dopamine agonists on inhibition of prolactin secretion [12].

These findings are in agreement with our results which have found that the prolactin hormone in lactating women is more than non-lactating women and the prolactin hormone increased in both groups in response to exercise.

### **CONCLUSIONS**

In this study we concluded that aerobic exercise has an effect on decreasing body weight of lactating females more than non-lactating while it has an effect on decreasing fat percentage in non-lactating females more than lactating.

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