

# IMPACT OF 16 WEEK AEROBIC EXERCISES ON BODY WATER ON SEDENTARY OBESE MEN

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## Abstract

The purpose of the present study was to examine the effect of aerobic exercise on order to restore body water and reduction dehydration among sedentary obese men. Sixty male adult between the age group of 20-30 years was selected as subject for this study. Participants were randomly assigned to aerobic exercises (obese=30) and another group was considered as control group (obese=30). DXA was used to measure each subject's body water, percentage body fat and lean mass. Each exercise session was 30 minutes long at an intensity corresponding to 50-60%, 3 days per week for total 16 weeks. Percent body fat and lean mass were affected positively by aerobic exercise. This study demonstrated that 30 minutes aerobic exercise improve adaptation of body fluids. Positive effect was found on all selected variable due to aerobic exercise done by sedentary obese men for 16 weeks regularly.

## Introduction

During exercise, increased capillary hydrostatic pressure caused by elevation of arterial pressure produces plasma volume shifts from the vascular space to the interstitial fluids. There are a number of “fluid retention” hormones that exert a profound control over this fluid regulatory system. Hormones are substances in the body that act to promote certain activity by specific organs. The fluid regulatory hormones act primarily on the brain and kidney to control both intake and output of water. The most important hormone of this type is the antidiuretic hormone, which responds rapidly to changes in body water status, and is responsible for controlling the rate of water retention by the kidneys. Early research suggests that the greater body water content in high estrogen states is likely due to changes in both water intake. Some of this excess water is retained in the blood vessels (i.e., in the plasma), leading to plasma volume expansion, which has potent effects on physical performance during heat stress. Most people walk every day but it is often overlooked as an exercise activity. Walking is one of the easiest, and cheapest, ways to improve your fitness and increase specific hormones in young individual. It is a light cardiovascular exercise, which means it improves the condition of your heart and lungs. Chumlea et al concluded that there is inadequate timely information on measured total and extra-cellular water volumes for the population. Distributional body water relationships within the body have been considered fixed, but there was evidence these relationships were affected by the level of fatness, body composition models and to our knowledge, no study has shown the effect of an exercise program on body water in obese men with a mean age of 24 years simultaneously that were performing the same exercise program. The purpose of this study was to investigate whether two months program of closely supervised walking exercise would be beneficial for increasing body water among healthy sedentary obese men.

## Material and Methods

Sixty young untrained male between the age of 20-30 years volunteered to participate in this study. Participants were randomly assigned to two group aerobic exercise group as experimental group and two control (obese=30) groups matched by BMI. Written informed consent for all procedures was obtained from all participants prior to entering the study. The following measurements were made at baseline prior to the start of the exercise program and at after completion of the 16 weeks training program. Body weight and height were recorded and body mass index (BMI) was calculated as weight (kg) divided by height (m) squared. DXA was used to measure each subject's body water, percentage body fat and lean mass. The DXA scans were performed in the Orthopaedic Diagnostic Centre at All India Institute of Medical Science, New Delhi. A target heart rate range between 55-70% was measured with an electronic heart rate monitor. The exercise program was accompanied by drinking water in every 10 minutes. The data were analyzed using the SPSS statistical package Student's t-test was used to assess the change in BMI, body weight and body water before and after the exercise intervention. A significance level of set at  $p < 0.05$  was used for all comparisons.

**Findings**

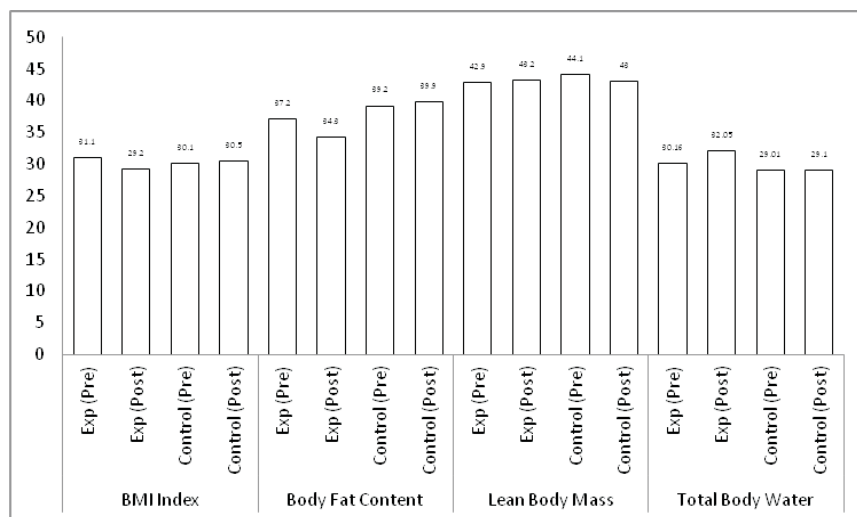
All sixty subjects (100%) completed the training program. Each variable used in this study is presented separated in below given tables.

**Table -1**  
**Comparison of BMI Index of Experimental and Control Group of Sedentary Obese Men**

Variable	Group	Mean	Standard	Mean	Standard	't' test
BMI Index	Experimental (Pre)	31.1	1.8	1.9	0.43	4.42*
	Experimental (Post)	29.2	2.1			
	Control (Pre)	30.1	3.5	0.4	0.24	
	Control (Post)	30.5	3.0			
Body Fat Content	Experimental (Pre)	37.2	4.1	2.9	1.02	2.84*
	Experimental (Post)	34.3	6.1			
	Control (Pre)	39.2	3.5	0.7	0.41	
	Control (Post)	39.9	3.2			
Lean Body Mass	Experimental (Pre)	42.9	5.1	0.3	0.11	2.72*
	Experimental (Post)	43.2	6.0			
	Control (Pre)	44.1	5.9	1.1	0.67	
	Control (Post)	43.0	6.3			
Total Body Water	Experimental (Pre)	30.16	7.8	1.89	0.33	5.72*
	Experimental (Post)	32.05	9.9			
	Control (Pre)	29.01	9.8	0.09	0.54	
	Control (Post)	29.10	10			

\*Significant at 0.05 level of significance  $t(0.05)(29) = 2.04$

Above, table indicate that all the variables selected (BMI, Body Fat Content, Lean Body Mass and Total Body Water) in this study had significant effect of 16 week aerobic training on obese men as calculated 't' value of all variables is higher than required tabulated value at 0.05 level i.e., 2.04 at 29 degree of freedom. Graphical representation of above table is made in figure no. 1.



**Fig. 01: Mean Values of Compared Variables of Experimental and Control Group of Sedentary Obese Men**

### Discussion of Findings

Purpose of this study was to assess the effect of exercise on body water in sedentary obese men. This difference may be due to the younger age of subjects in our study and the nature of the mechanical load. It is found that 30 minutes of aerobic exercise at the range of 50-75% maximum heart rate was enough to decreasing the fat mass and increasing lean body weight. "Lean mass" means muscle. "Lean mass," the researchers conclude, "is the major determinant of body size, providing further evidence that body size is adapted to the dynamic load imposed by muscle force rather than passive loading" by fat. On the other hand Muscle mass able to hold more water weight to fat mass. These mechanisms probably include increasing plasma protein oncotic pressure, differences in peripheral vasoconstriction in active muscles and inactive tissues, and elevated lymph flow. The interaction of these factors provides optimal thermoregulatory and cardiovascular stability. The beneficial effects of hyperhydration and subsequent hypervolemia are manifest in the adaptation of body fluids and electrolytes to exercise training. Thus, with regard to fluid receiving shifts during exercise, training is an effective way to become hyper hydrated and to reduce the dehydration. Stachenfeld et al similarly indicates water retention was the primary contributor to increasing estrogens during endurance exercise. Weinheimer et al supported that young, physically active women can completely compensate for exercise-induced sweat losses by increasing adequate water intake. Bossingham et al showed that healthy older adults maintain water input and balance comparable to those of younger adults and have no apparent changes in hydration status. To prevent dehydration, consume plenty of fluids is helpful. In conclusion this study this study demonstrated to aerobic exercise improved adaptation of body fluids and to exercise training obese male.

### References

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