RESEARCH ARTICLE

ASSESSMENT OF BODY COMPOSITION OF SEDENTARY WORKING WOMEN

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ARTICLE INFO	ABSTRACT
	Obesity is an increasing global problem. It has important implications, as it is associated with various life threatening diseases and metabolic disorders. Scientists at the Tel Aviv University have confirmed the long-held notion that sedentary lifestyle leads to obesity. Researchers said that the more time people spend sitting, the more fat they accumulate in the lower half of their bodies, or backside. According to the latest survey conducted by the Centers for Disease Control and Prevention, more than 35 percent of American adults and 17 percent of American children are considered obese. Obesity causes diabetes, heart disease, stroke, and certain types of cancer, placing a huge burden on health care systems and the economy. The medical condition is usually treated through a combination of diet, nutrition, exercise, and other techniques. The present study was initiated to estimate and compare the body composition of sedentary and nonsedentary working women. Most of the body composition studies are in males. Very few studies have been taken in female sedentary working women. We intended to study body composition parameters in sedentary working women and compare these parameters in women having nonsedentary life-style. Objective was to to calculate Body mass index [BMI], Body fat percentage and Waist-hip ratio [WHR] and to caregorise subjects according to classification and compare between groups. Body composition of sedentary working women (30) compared with nonsedentary working women (30). Obesity is an important indicator of health since it is significantly linked to morbidity and mortality. Our study clearly shows that prevalence of obesity is high in sedentary working women. Working women having sedentary life style need to undertake regular 30 minutes of moderate to vigours running, swimming, bicycling or 60 minutes of brisk walking exercise, to reduce or to prevent obesity and thereby preventing complications of obesity.

INTRODUCTION

Obesity is an increasing global problem. It has important implications, as it is associated with various life threatening diseases and metabolic disorders (Colle *et al*., 1999). National survey on the prevalence of overweight (defined at the time of this 1994 publication as BMI≥27) among adult in the united states, compared with the government's of the objective of the year 2000 (Calle, 1999). Between 1988 and 1991, one third of adults aged 20 to74 years classified as overweight. This represents a dramatic increase over previous surveys, with overweight occurrence particularly high among women. New classifications established on June 18, 1998, by the 24-member expert panel convened by the National Heart Lung and Blood Institute, now as BMÎ ≥ 30. As the result of these new standards, the prevalence of overweight obesity in

adults has increased to about 100 million Americans (Colle, 1999). With the major increase from a near-doubling of the obesity component to one in four Americans over the past two decades (Despres, 1997 and Folsom, 1993). As January 2000, 25% of the adult population classifies as obese, compared with only 14.5% in 1980. Similar increases in obesity around the world. (Lappalainen *et al*., 1992; Popkin BM,1998; Wardle J *et al*., 2001; Zimmerman MB *et al*., 2000) contributing to the rising tide of diabetes and cardiovascular disease-has led the World Health Organization and the International Obesity Task Force to declare a global obesity epidemic. (Taubes, 1998) Obesity is now the second leading cause of preventable deaths in the United states Scientists at the Tel Aviv University have confirmed the long-held notion that sedentary lifestyle leads to obesity. Researchers said that the more time people spend sitting, the more fat they accumulate in the lower half of their bodies, or backside.

According to the latest survey conducted by the Centers for Disease Control and Prevention, more than 35 percent of

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American adults and 17 percent of American children are considered obese. Obesity causes diabetes, heart disease, stroke, and certain types of cancer, placing a huge burden on health care systems and the economy. The medical condition is usually treated through a combination of diet, nutrition, exercise, and other techniques. The present study was initiated to estimate and compare the body composition of sedentary and nonsedentary working women. Most of the body composition studies are in males. Very few studies have been taken in female sedentary working women. We intended to study body composition parameters in sedentary working women and compare these parameters in women having nonsedentary life-style.

Objective was to to calculate body mass index [BMI], body fat percentage, waist-hip ratio [WHR] and to compare between groups.

MATERIALS AND METHODS

30 sedentary working women in Government Medical College aged between 30- 58 years were enrolled in the study as study group. Selection criteria - The subjects were asked to fill up a questionnaire about their daily physical activities, accordingly it was ensured that the subjects had sedentary life-style. Following questionnaire were asked: Type of exercise, Frequency of exercise and Duration of exercise. Results of questionnaire as follows : 91% of women were not doing any type of exercise, in 9% of women intensity, frequency and duration of physical exercise was far less than desired levels; 100% of women were using petrol vehicle for transportation, working hours of study group was 8-9 hours/day. The women of same age group having nonsedentary life style were included in control group.

systemic examination was done of all subjects from study and control group.

Age wise distribution of subjects

Age	Control gr. No. of subjects	Study group No. of subjects
30-39	10	07
40-49	12	11
50-58	08	12
Total	30	30

Following Parameters were studied: - 1) Body mass index 2) Body fat percentage 3) Waist- hip ratio.

Body Mass Index: BMI is an indicator of optimal weight. BMI = Weight (Kg) / Height (m^2). Classification of body Composition according to BMI is as follows, BMI of 30 is the most commonly used as threshold for obesity.

BMI	Body Composition
18.6-24.9	Healthy
25.0-29.9	Over-weight
30.0-34.9	Class I obese
35.0-39.9	Class II obese
40.0 & above	Class III obese

Skin Fold Measurements: It is a practical method to estimate total body fat content. Skin fold measurements at multiple sites correlate well with total body fat (Kuczmarski, 1997). In our study we measured the skin fold thickness at four Sites; viz Biceps, Triceps, Suprailliac and Subscapular using skin fold calliper. Gradation of body fat percentage in ascending order is as follows (Lappalainen, 1992) 1) Normal fat 2) Early fat deposition 3) Grade I fat deposition 4) Grade II fat deposition.

Waist-Hip ratio: WHR was use to assess the abdominal adiposity or central obesity.

Table 1. Body Mass index of control Group

Age	Healthy	Over-weight	Class I obese	Class II obese	Class III obese
30-39	09	1	0	0	0
40-49	08	2	2	0	0
50-58	04	3	1	0	0
Total= 30	21(70%)	6 (20%)	3(10%)	0	0
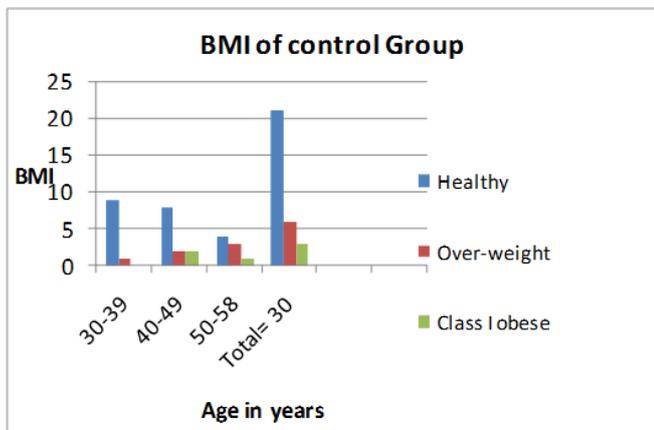
The women in control group were selected from building construction site; they were doing 8 to 9 hours nonsedentary work since not less than 1 year. A detailed history was taken including personal history, past history, general and detailed

WHR > 0.8 indicates abnormal distribution of fat. It is the ratio for significant health risk (Lappalainen, 1992).

RESULTS

Our BMI study data shows that the 70 % women were healthy, 20 % and 10 % women were overweight and class I obese respectively in control group, nobody was class II or class III obese. In study group 23 % women were healthy; 50%, 16%, 10% women were overweight, class I and class II obese respectively (Table 1,2). According to Body Fat Percentage 66% women had normal fat, 26%, 6% women showed early fat deposition; and grade 1 fat deposition respectively in control Group. In study group 66% women showed early fat deposition 26%, 6%, women shows grade I and grade II fat deposition. It was noteworthy that nobody had normal fat deposition (Table 3,4). According to WHR 33 of women had WHR > 0.80 in control Group. Whereas 80% women had WHR > 0.80 in study Group which is an indicator of central obesity (Table 5).

Table 2. Body Mass Index of study Group

Age	Healthy	Over weight	Class I obese	Class II obese	Class III obese
30-39	01	5	1	0	0
40-49	03	6	1	1	0
50-58	03	4	3	2	0
Total= 30	7(23%)	15(50%)	5(16%)	3(10%)	0
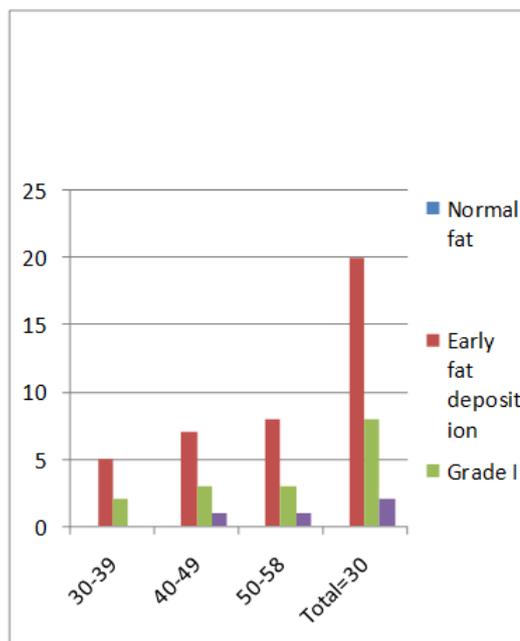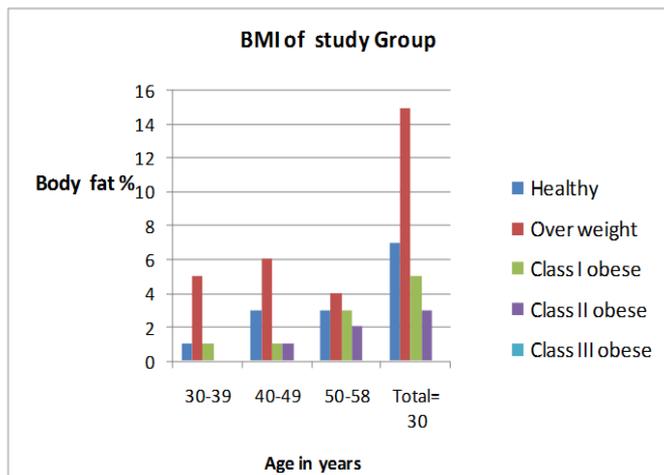
Table 3. Body Fat Percentage of control Group

Age	Normal fat	Early fat deposition	Grade I	Grade II
30-39	6	04	0	0
40-49	8	03	1	0
50-58	6	01	1	0
Total=30	20 (66%)	08 (26%)	2(6%)	0
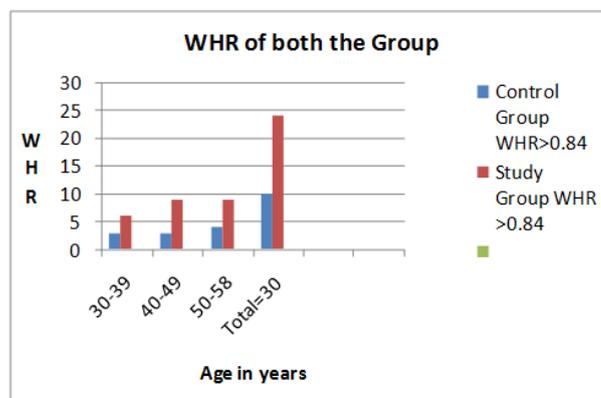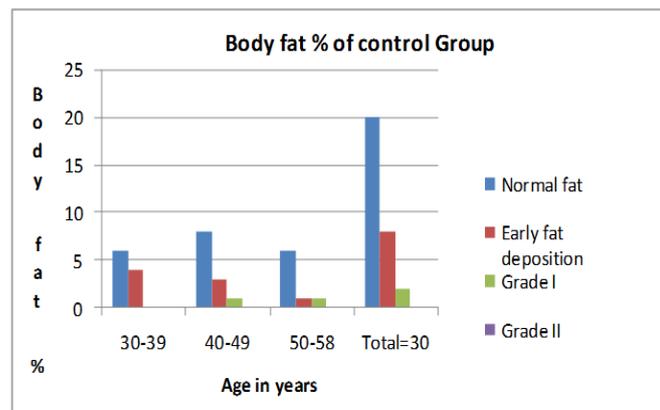
Table 4. Body fat percentage of study Group

Age	Normal fat	Early fat deposition	Grade I	Grade II
30-39	0	5	2	0
40-49	0	7	3	1
50-58	0	8	3	1
Total=30	0(0%)	20(66%)	8(26%)	2(6%)

Table 5. Waist - Hip Ratio of control and study Group

Age	Control Group WHR>0.80	Study Group WHR >0.80
30-39	03	6
40-49	03	9
50-58	04	9
Total=30	10 (33%)	24 (80%)

Body fat % of study group

DISCUSSION

Sedentary life style and consequent diseases are major public health problem the world is facing today. Sedentary life style with consequent obesity increase the risk of cardiovascular complications. An association between sedentary life style and incidence of cardiovascular diseases has been demonstrated in various epidemiological studies. Obesity (more precisely, over fatness) defined as an excess accumulation of body fat, is a heterogeneous disorder with a final common pathway in which energy intake chronically exceeds energy expenditure. It is an important indicator of health since it is significantly linked to morbidity and mortality. Large scale epidemiological studies suggest that the moderate to severe BMI increases the risk of cardiovascular complications (including hypertension and

stroke), certain cancers, diabetes, gallstones, osteoarthritis, renal disease, and various metabolic disorders (National Task Force on the Prevention and treatment of Obesity, 2000; Popkin *et al*., 1998; Rexrode *et al*., 1998) A BMI 25 - 30 should be viewed as medically significant. Central fat deposition independent of fat storage in other anatomic areas, reflects an altered metabolic profile. It increases risk for hyperinsulinemia and glucose intolerance, type 2 diabetes, endometrial cancer, hypertriglyceridemia, hypercholesterolemia, hypertension and atherosclerosis, (Rosengren, 1999) WHR may be the best predictor of these complication (Taubes, 1998). More specifically, ratios of waist: hip girth that exceed 0.80 for women relate to increased risk of death, even after adjusting for BMI (Wardle, 2001; Wickelgren, 1998; Williams, 1997 and Williams, 1997). Excess weight distribution in the abdominal area (accompanying high blood insulin levels) also increases colorectal cancer risk. For example when waist girth exceeded 82 cm in women, risk is nearly twice that of smaller girth individuals (Zimmerman, 2000).

Conclusion

Our study clearly shows that prevalence of obesity is high in sedentary working women. In our study we also found that increase in BMI as age advances is also an reflection of physical inactivity. The major factor leading to obesity in this study population seems to be an less physical activity level, as suggested by the life-style of the subjects.

Recommendations

Working women having sedentary life style need to undertake regular 30-40 minutes of moderate to vigours running, swimming, bicycling or 60 minutes of brisk walking exercise, to reduce or to prevent obesity and thereby preventing complications of obesity.

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