

Prospective Analysis of obesity among 490 Patients

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ABSTRACT

Metabolic Syndrome is prevalent in World level and it leads to serious health hazard which was due to increased weight, abdominal obesity, insulin resistance, sedentary lifestyle, age and genetic factors. Lifestyle modification, pharmacology and surgery helps to maintain weight which directly linked to met'S. **Aim:**To assess the lifestyle disease condition in cosmopolitan city among women and men from rural and urban areas . To evaluate the effect of bariatric surgery,nutrition knowledge and physical exercise on obesity. **Materials and Methods:**The study was conducted at BGS Gleneagles Global Hospitals among male and female patients aged 20 to 70 years based on a random sampling procedure . 495 male & female subjects have been selected between 18 to 30 years(28), 31 to 40 years (61), 41 to 50 years(48) 51 to 60 years (49), 61 to 70 years (11), 71 years and older (2). **Results and Discussion:**Mean Height, weight, BMI, waist circumference, Hipcircumference, WHR of male and female were 168 ± 7.2 , 156 ± 6.62 , 92.19 ± 17 , 79.38 ± 13.75 , 32.29 ± 5.88 , 32.52 ± 5.13 , 41.99 ± 6.65 , 40.2 ± 6.23 , 43.36 ± 6.07 , 1.10 ± 2.23 , 0.91 ± 0.08 respectively. The overweight ,obesity Grade I population was more in 41-50 years

age group of both sexes, Grade II obesity was more in female population in 41-50 years, 51-60 years age groups. .Weight loss was more effective in morbid obese who underwent bariatric Surgery than non surgical subjects (23 kgs and 8.34 Kgs). **Conclusion:**It can be concluded that abdominal obesity found to be extremely high in Grade I obesity. Decrease in BMI was achieved by increased awareness and general well being.(Key words: BMI,WHR,Met's,Bariatric)

Introduction

Excessive accumulation above normal fat deposits are defined as obese or overweight. Double burden of malnutrition are an alarming sign of importance in India. Apart from high income countries,there was a steep increase among urban areas of low and middle income countries. There were one billion obese population among adults, adolescents and children(650 million,340 million & 39 million).Non communicable diseases arises due to obesity. Diabetes Mellitus(T2DM),High blood pressure, CVD ,stroke, cancers and psychological issues.NCD and obesity were due to transition of nutrition from rural to urban. Remarkable weight loss achievement percentage were due to nutrition education, stress management, inclusion of physical activity and surgical procedures(Bariatric)

Materials and methods:

In the chapter the details of the method used for the research are given in detail. The study was conducted in the city of Bangalore in the period 2010-2018, under the following headings.

- A. Location Selection.
- B. Sample Selection.
- C. Research tools.
- D. Research behaviour between women and men.

A. Location Selection:

The study was conducted at BGS Gleneagles Global Hospital, Bangalore. There are 450 Quaternary beds. The hospital is well equipped with more than 25 specialities including organ transplants and provides 24-hours care. This hospital has been selected to identify topics.

B. Sample Selection:

Male and female patients aged 20 to 70 years in the Department of Health, Endocrinology, Cardiology and Cardiac Surgery were selected based on a random sampling procedure from August 2017 to February 2018. In a random sampling method, all subjects has an equal chance of being chosen.[1]

C. Research tools:

The questionnaire is designed to gather the information needed for the selected subjects. A questionnaire is a tool or tool for answers obtained from a multitude of questions by a respondent or an expert.[2]. The questionnaire included information related to social pattern, age, gender,

length, weight, religion, marital status, family type, annual income, past and present dietary pattern assessment program and information on the disease. Each topic was discussed by an investigator in person. The investigator himself completed a questionnaire and collected information regarding the person's examination.

Research behaviour between women and men.

Each question options was discussed in person and details of family history, accommodation, social culture, food, risk factors, problems and risk-related information were collected.

Anthropometric measurements: Body measurements are a useful analysis of the nutritional status of patients. Anthropometric measurements of the subjects recorded for all selected samples were height, weight, Body Mass Index (BMI), body fat analysis, waist circumference, Hip waist measurement and Handgrip strength.

Height: A person's height is a measure of the bone, leg, hip, spine and skull [3]. These heads are made to stand straight with heels together without shoes and arms hanging. The head is made to lean against a smooth wall where marking is up to 0.1cm with accuracy. The head, the shoulder, the buttocks, and the heelings were all aligned and aligned with the ground. The reading was taken from a piece of keeping a wood gently on the head (vertex region) .The line facing the piece of wood was marked and accurately recorded up to 0.1cm.

Weight: Weight is a key anthropometric measurement. The weight of the heads was measured using a measuring bathroom scale. The scale was tested for accuracy before taking measurements. This is done to check if the indicator needle was at zero mark before the weight. . Then the weight was recorded .

Body Mass Index (BMI):

Body Mass Index is calculated from the height and weight columns of all subjects using a formula. BMI is compared to a standard Reference.

Waist Hip Ratio:

Hip measurement was taken with the smallest measure between the ribs. Hip measurements were taken at the widest point outside the buttocks.

Waist Hip Ratio= Waist (cm) / Hip Circumference (cm) [4]

Body Fat Analysis:

Non-invasive measure of body strength, weight loss and hydration. Analyzes body fat percentage (stored fat), visceral fat, body age.

It is performed on all selected patients using a karada scan body fat analysis machine. It simply involves the placement of two electrodes on a person's hand and foot.

Hand Holding Power(Hand Grip strength)

It is a measure of muscle strength or great strength / tension caused by the muscles of a person's arm.

It can be measured by measuring the amount of force that the hand can squeeze around the dynamometer. Strength is usually measured in pounds/kilograms.

Biological Assessment(Biochemical)

The serum lipid profile helps to determine the amount of different lipids in the blood to assess the risk levels of heart disease. Cognition of cholesterol, triglycerides and various forms of lipoprotein was performed to assess people who may be at high risk for cardiovascular risk Diseases [5]. The lipid fractions of total cholesterol, triglycerides, low density lipoprotein and high density lipoprotein were estimated in all samples selected for this study. Blood is drawn early in the morning when in a state of fasting. Pressure is applied to the upper part. The subject was asked to keep the arm in a relaxed position. Approximately 15ml of blood was extracted from a vein using a syringe and disposable needles with the help of a specialist and kept in dosage on the same day. Serum triglyceride levels were measured

HDL Cholesterol was estimated using CHOD-PAD method furnished by [6]

HDL Cholesterol was estimated using CHOD-PAD method furnished by Grove[7]

LDL Cholesterol and VLDL Cholesterol levels were computed using the formulae

$$\text{LDL} = \frac{\text{Total Cholesterol} - \text{Triglyceride} - \text{HDL}}{5}$$

$$\text{VLDL} = \frac{\text{Triglyceride}}{5}$$

Fasting Blood Glucose, Post prandial blood glucose, Homocysteine, TSH were analysed from the blood samples of the subjects.

Clinical Examination

Clinical Examination is an important tool to assess the health status of the patients. Data on general health status, blood pressure, illness, treatment taken and surgery details were recorded for each subject throughout the study period.

General health Status:

General health status of each subject were recorded by the interview which is given by the interview which is given by the Diet Questionnaire.

Blood Pressure:

Blood Pressure of the subject was checked with the help of a sphygmomanometer. It is the device used for measuring the blood pressure.

Illness and treatment

Illness during the disease and treatment given was recorded throughout the investigation.

Stress Assessment

Stress was assessed using the social Readjustment Rating Scale (SRRS), more commonly known as the Holmes and Rahe Stress Scale. It is a well known tool for measuring the amount of stress

experienced within the past year. It is a tool with forty three life events questions and it helps us to measure our total stress score appropriately.

Diet counseling:

It is a two-way interaction through which a client and a trained counsellor interpret the results of nutrition assessment, identify individual nutrition needs and goals ,discuss ways to meet those goals, discuss ways to meet those goals and agree on next steps. Nutrition counselling aims to help clients understand important information about their health and focuses on practical actions to address nutrition needs as well as the benefits of behaviour change.[8]

Statistical Analysis:

Chi square test, regression, T test, Pearson Correlation Coefficient, Probability Distribution and analysis of variance statistical analysis was carried out in the study.

Ethics Committee:

The Institutional ethics committee, BGS Gleneagles Global Hospitals, Bangalore approved the prospective study on impact of diet counselling in obesity, its association with metabolic syndrome among women and men.

Number and Date:IEC/Approval/2017-07/08,12th August 2017.

Results and Discussion

Mean BMI of the selected subjects for the study population based on age and gender is given. It was found that females were overweight and obese 2 than males. Males were obese 1 and morbid obese than females.

Body weight measurement without other anthropometric measurements provide accurate predictions. TSF and total body fat are not accurate as BMI prediction of fat in obese interrupted by body mass, body water and due to increased intracellular, extracellular ratio in obese. Dual energy X-ray absorptiometry measures composition of body. Fatty infiltration of skeletal muscle , non adipose fat can be studied through CT imaging method. Different techniques to be applied to rule out challenges in obesity assessment of body composition.[9]

Fat free mass loss determined through densitometry and other techniques like TSF, BMI and Bio impedance analysis found similar in both sexes.[10].

Skin fold thickness, weighing under water, bioelectrical impedance, Dual energy X-ray absorptiometry, isotope dilution were the methods to measure fatness in body and standardization of these methods were difficult in terms of machines, comparisons of study period. (CDC).

Morbid obese and obese grade II population was found to be more in waist circumference (52.6 ± 10.27 , 43.35 ± 3.59) than overweight and obese Grade I population (39.34 ± 5.61 , 40.47 ± 2.68) respectively.

Hip circumference was found more among Morbid obese, obese grade II (55.79 ± 10.6 , 46.59 ± 5.22) than obesity Grade II and overweight respectively.

Waist Hip ratio is more in overweight and morbid obese population (1.98 ± 0.15 , 1.93 ± 23.4) than obesity Grade I and obesity Grade II (0.9392 ± 0.06 , 0.93 ± 18.34) respectively. Body fat percentage was found more in obesity Grade I, overweight (35.76 ± 4.82 , 35.19 ± 10.27) than obesity Grade II and morbid obese (21.27 ± 9.20 , 26.99 ± 15.38) respectively.

Visceral fat was found more in morbid obese, obesity Grade I (28.76 ± 10.10 , 25.6 ± 8.47) than obesity Grade II and overweight (22.56 ± 8.02 , 13.49 ± 2.99) respectively.

Hand Grip strength (Right hand) was found more in overweight and morbid obese population. (33.66 ± 6.03 , 28.16 ± 10.10) than obesity Grade I, obesity Grade 2 (24.35 ± 7.44 , 22.25 ± 9.8).

Hand Grip strength (Left hand) was found higher in morbid obese, obesity Grade II (41.70 ± 5.32 , 40.42 ± 3.68) than obesity Grade I and overweight population (18.19 ± 3.55 , 28.12 ± 11.32).

Resting metabolism was more in morbid obese, obesity grade 2, obesity grade 1 (2344.89 ± 1211 , 1825.6 ± 908 , 1750.39 ± 238.58) than overweight population (1625.247 ± 263.63) Body Age was found in obese grade 2, obesity grade I, morbid obese (64.38 ± 15.81 , 62.33 ± 8.92 , 62.69 ± 11.98) than overweight population (57.3813 ± 9.56).

Poor handgrip strength was noticed in long term obese subjects in later life weight reduction and normal weight maintenance improves strength of muscles.[11]

From the study it was found that weight loss in male and female were more in 4th month and 3rd month 10.6413 ± 8.01 , 11.2670 ± 4.24 respectively.

Intentional weight loss above 10% observed among 419 adults participants. Intake was more in men than women with similar physical activity. [12].

Initial weight loss was more in men and organized weight loss was more in women.

Ten year study conducted by [13] observed that obesity degree has strong correlation with cancer in colon, CVD, hypertension, gall stones, Insulin resistance, stroke especially more in male population. The range of weight between 22.0-24.9 also increase chronic diseases and maintenance of BMI between 18.5 to 21.9 for reduction of risks.

Gitanjali et al(2019) observed that Life quality gets affected by obesity should be managed through single treatment or in combined therapy like lifestyle, surgical, non-surgical, medications.[14].

The above table indicates that there was reduction in BMI at 4th month among Female and Male subjects (32.52168 ± 5.13615 , 32.361 ± 5.9786 and 28.36 ± 4.072366 , 29.11 ± 13.63283) respectively. Men tends to lose more weight than women in eleven studies restriction in energy with exercise.[15].

Healthier food choices in three major meals was getting quick results in both sexes through genetically there was hormone difference. Men lose weight faster than women due to presence of less fat and high muscle mass. [16].

Intake was more in men than women with similar physical activity .Women opted proper program for weight loss and men's weight loss was on individual approach.[17].

Management of weight in male and female were independent irrespective of age, Body mass index, economical status, Clinical condition.[18]

There was difference in weight loss between men and women in studies. Weight loss in women were less compared to men. Restriction in calories with physical activity evidenced in women and men weight loss. [19]

Mediterranean Diet consumption for weight loss changed the appetite in men and women with differences [20].

It was analysed prospective, retrospectively among 51,505 Children between 0 to 14 years, 15 to 18 years age and found there was peak weight gain (2-6 yrs age) which directly influence adolescence and adulthood.[21].

It was revealed from the studies that American women from Mexico were obese than American white non Hispanics.[19].

Mexican American women were obese than men. It was concluded that there were relationship between BMI and migrants especially Hispanic females.

It was observed that 91.51% subjects were disturbed to certain extent due to weight gain, 3.83% disturbed very much, 4.04% peaceful, 0.6% in normal emotions. It was found lots of improvement after diet counselling and treatments 83.8% were disturbed to certain extent, 3.23% disturbed very much, 8.08% peaceful, 4.84% normal which was increased in terms of peacefulness, normal mind and decreased in terms of negative feelings.

It was concluded from the 18 year study that there were higher incidence of mild cognitive impairment in subjects due to computer or TV, Junk foods, Sugary drinks, Snacks than subjects exposed to Ping pong, writing, reading, martial arts. Cognitive impairments linked with development of obesity.[21].

Conclusion:

It can be concluded that there was remarkable weight loss in 3 months due to nutrition education. Central obesity was found more among study population. Sedentary lifestyle, transition from rural to urban areas, genetic predisposition, diet pattern, stress, negative weight loss tips linked with obesity irrespective of age and gender. Abdominal obesity found to be extremely high in Grade I obesity. Decrease in BMI was achieved by increased awareness and general well being.

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Table 1: The Mean BMI of the selected subjects for the study population based on gender is given

Gender	Variable	Number	BMI(kg/m ²)
Male			
	Overweight	84	27.32±1.06
	Obese 1	157	31.61±1.47
	Obese 2	29	36.86±1.43
	Morbid obese	26	47.63±6.04
Female			
	Overweight	57	27.52±1.02
	Obese 1	89	31.5±1.53
	Obese 2	39	37.1±1.37
	Morbid obese	16	45.11±2.90

Table 2: Mean Anthropometric measures of the subjects.

Anthropometric measures	Standard values	Male	Female	F Value
Height (cm)	-	168±7.2	156.25±6.62	0.8382 P=0.9088 (NS)
Weight (kg)	60	92.19±17	79.38±13.75	0.6371 P=0.9996 (NS)
BMI(kg/m ²)	20-24.9	32.29±5.88	32.52±5.13	0.7135 P=0.9944 (NS)
Waist Circumference (cm)	M-<40 inch	41.99±6.65	40.2±6.23	0.8807 P=0.8313 (NS)
Hip Circumference		43.36±6.84	44.28±6.07	0.7668 P=0.9778
WHR	M<0.95 inch F <0.85 inch	1.10±2.23	0.91±0.08	0.0012 P=1 (NS)

Table:3 Mean Composition measures of the Subjects(Table 3) :

Measures	Overweight (N=214)Mean± SD	F Value	Obese1(N=1 82) Mean±SD	F Value	Obese2(N= 60) Mean±SD	F Value	Morbid Obese N=39 Mean±SD	F Value
Waist Circumference	39.34±5.61	0.06 NS (P<0.95)	40.47±2.68	0.2748 NS (P=0.999)	43.35±3.59	0.2888 NS (P=0.999)	52.6±10.27	0.1564 NS (P=1)
Hip Circumference	41.36±5.29	0.078 NS (P=1)	43.0120±2.0 5	0.455 NS (P=1)	46.59±5.22	0.1789 NS (P=1)	55.79±10.6	0.1583 NS (P=1)
Waist Hip Circumference	1.98±0.15	348.49 ** P<0.000 01	0.9392±0.06	529.10 ** (P<0.0000 1)	0.93±18.34	357.02 **	1.93±23.4	0.6973 NS (P=0.864)
Body fat %	35.19±10.27	0.0210 NS (P=1)	35.76±4.82	0.0829 NS (P=1)	21.27±9.20	0.0370 NS (P=1)	26.99±15.3 8	0.1274 NS (P=1)
Visceral fat	13.49±2.99	0.2484 (NS) P=1	25.611±8.47	0.1144 NS (P=1)	22.56±8.02	0.0289 NS (P=1)	28.76±10.1 0	3.03 ** P=0.000 4
HGS Right	33.66±6.03	0.0210 NS P=1	24.35±7.44	0.0353 NS (P=1)	22.25±9.8	0.028513	28.76±10.1 0	0.1348 NS P=1
HGS Left	28.12±11.32	0.0171 NS P<0.15	18.19±3.55	0.1528 NS (P=1)	40.42±3.68	0.1167 NS (P=1)	41.70	3.03 ** (P=0.000 4)
RM	1625.247±263. 63	3.22 ** P<0.000 01	1750.39±238 .58	3.66 ** (P<0.0000 1)	1825.6±908	4.85 ** (P<0.0000 1)	2344.89±12 11	0.0001 NS (P=1)
B.A	57.3813±9.56	0.0240	62.33±8.92	0.0206	64.38±15.8	0.0139	62.69±11.9	0.1916

		NS (P=1)		NS (P=1)	1	NS (P=1)	8	NS (P=0.999 9)
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Table 4: Weight loss in male and female.

Sex	Weight loss			
	2 nd month mean±SD	3 rd month Mean±SD	4 th month Mean±SD	R Value
Male	7.2148±6.4198	7.2384±	10.6413±8.0166	0.9987 ** P<0.00001
Female	5.6335±4.23	11.2670±4.24	8.43±5.42	1 P<0.00001

Comparison of Initial and Final BMI among Female and Male subjects.(Table.5)

Sex	BMI	
	Initial Mean±SD	Final Mean±SD
Female (N=197)	32.52168±5.13615	32.361±5.9786
Male (N=299)	28.36±4.072366	29.11±13.63283

Figure 1 :Present and past life style N=495

