

Obesity Causes Complications and Dietary Weight Loss Strategy

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ABSTRACT

Background: Obesity is one of the most daunting health challengers of the twenty first century. Obesity is the most common nutritional disorder in the western countries and among the higher income groups in the developing countries. Once considered a problem only in high income countries, overweight and obesity are now dramatically on the rise in low- and middle-income countries, particularly in urban settings.

Objectives:

To implement and evaluate the effectiveness of the dietary strategy among selected obese subjects.

Methodology:

Non experimental - descriptive design is chosen for the study. The study will be conducted in Vijayawada city. A sample of 300 students attending different colleges and university in Vijayawada .Subjects aged above 18 years and below 26 years are included with BMI over 25 and waist circumference of 75 to 85cms and without any other health complications. From the randomized sample (n=150), a sub sample of n=75 were given a dietary intervention, that involves a booklet on low calorie diets with nutritional counselling on obesity, obesity related risk factors, low calorie foods and behaviour changes, initially on the first day following first Saturday of every month up to six months

Results:

There was a reduction in anthropometric, biochemical and clinical parameters upon six months of diet changes and the dietary intervention showed a limited increased effect on weight reduction when compared to control group.

Conclusion:

The dietary intervention can be followed on long term basis to reduce the problem of obesity in young adults. A change in dietary habits can be effective to reduce the weights in obese individuals on long term basis.

Keywords: Obesity, BMI, Lipid profile, Dietary weight loss strategy.

INTRODUCTION

Obesity is one of the most daunting health challengers of the twenty first century. Obesity is the most common nutritional disorder in the western countries and among the higher income groups in the developing countries. Obesity may be defined as a condition in which excessive accumulation of fat in the adipose tissues has taken place. It arises when the intake of food is in excess of physiological needs (M Swaminathan) [1-4]. Obesity is a complex condition one with serious social and psychological dimensions, that affects virtually all age and socioeconomic groups and threatens to overwhelm both developed and developing countries. Generally, although men may have higher rates of overweight, women have higher rates of obesity. For both, obesity poses a major risk for serious diet-related non communicable diseases, including diabetes mellifluous, cardiovascular disease, hypertension and stroke, and certain forms of cancer. Its health consequences range from increased risk of premature death to serious chronic conditions that reduce the overall quality of life [7].

Once considered a problem only in high income countries, overweight and obesity are now dramatically

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on the rise in low- and middle-income countries, particularly in urban settings [5]. Obesity is now considered as growing public health issues and associated with increase morbidity and mortality as well as increased social economic cost.(Carney P M,2005).

Obesity is now reaching epidemic proportions in both developed and developing countries and is effecting not only adults but also children and adolescents over the last 20 years, obesity has become the most prevalent nutritional problem in the world eclipsing under nutrition and infectious disease as the most significant contributor to ill health and mortality. It is a key risk factor for many chronic and non-communicable diseases.

Obesity should no longer be viewed as a cosmetic or body image issue. According to the World Health Organization, obesity is one of the most common, yet among the most neglected, public health problems in both developed and developing countries. According to the WHO World Health Statistics Report 2012, globally one in six adults is obese and nearly 2.8 million individuals die each year due to overweight or obesity (WHO,2012). Due to the increased risk of morbidity and mortality, obesity is now being recognized as a disease in its own right [6].

Obesity is evolving as a major nutritional problem in developing countries, resulting in increased burden of chronic disease (Anil Faisal,). India ranks third in the obesity list with every fifth Indian being overweight or obese, yet obesity is not at national health hazard in India. Obesity begins in childhood where 80% of obese children become obese adults. The body composition and metabolism of Indians make them especially prone to adiposity and its consequences (Anil p Kumar, Faisal, 2015). Indians are currently exposed to obesogenic environment thereby leading to a sharp rise in non-communicable diseases [8]. As the level of economic development of a country improves, the burden of obesity generally shifts towards poorer people. (Subramanian and smith, 2006).

Overweight and obesity means abnormal or excessive fat accumulation that presents a risk to health. For adults overweight and obesity ranges are determined by using weight and height to calculate the body mass index, weight in kilograms divided by the square of the height in meters (kg/m^2). The WHO defines a BMI equal to or greater than 25 as overweight category and a BMI equal to or greater than 30 as obesity (WHO, 2011). BMI is a simple index use for assessment of overweight and obesity (WHO, 1995). Higher BMI is associated with morbidity and mortality. The treatment for obesity includes dietary management, physical activity and exercise, anti-obesity drugs and gastrointestinal surgery being suggested in extreme cases, according to WHO India is currently grappling with multiple health challenges spanning the life cycle. On the one hand, India has one of the highest numbers of hungry and undernourished children, and on the other, non-communicable diseases (NCDs) are the leading causes of death and disability [9]. Several drivers, such as accelerated economic growth an expanding middle-class population, growing urbanization and an increasingly sedentary lifestyle, contribute to the rise of NCDs as a major public health challenge in an Indian context (Upadhay RP.2012). Ethnic South Asians are so vulnerable to diabetes that, in the United kingdom, being of Indian descent is viewed as a risk factor in itself (Khunti K Kumar S Brodie J, 2009.). Whether this susceptibility is genetically, epigenetically or gestation ally programmed is as yet not well determine, but its amplified expression due to urbanization magnifies the impact of the nutrition transition in India(Prentics AM. 2009.).Overweight and obesity are important risk factors for NCDs (Chopra SM, Mishra A, Galati S, Gupta R. 2013).

The rising prevalence of overweight and obesity in India has a direct correlation with the increasing prevalence of obesity-related co-morbidities like hypertension, the metabolic syndrome, dyslipidaemia, type 2 diabetes mellitus (T2DM), and cardiovascular disease(CVD) (Gupta R, Gupta VP,SarnaM,et al. 2002).(Gupta R, Mishra A. 2007).

Obesity is recognized as an important risk factor for various diseases. Increased body mass index(BMI) is cause for death from cardiovascular disease in men.(Calle EE, Thun MJ, PetrelliJM,Rodriguez C.1999).High BMI may indicate either increased fat or fat free mass and body composition being affected by ethnicity, growth patterns, socioeconomic, cultural and behavioural patterns.(Routh VH, Stern JS,Horwitz BA.1996). The International Diabetes Federation has accepted BMI value of $>25\text{kg/m}^2$ and 23kg/m^2 as the cut-off for obesity for Asian men and women respectively.(Eckel RH, Grundy SM, Zimmet PZ.2005).Higher body mass index is associated with morbidity and mortality especially that related to diabetes mellitus and cardiovascular diseases.(WHO;1995.) [10].

METHODOLOGY

Non experimental - descriptive design is chosen for the study. The study was conducted in Vijayawada city. A sample of 300 students attending different colleges and university in Vijayawada. Sample size consists of 300 young adults. Subjects aged above 18 years and below 26 years is included who had BMI over 25, waist circumference of 75-85cms and without any other health complications.

After obtaining consent from the participants the investigator briefed the research work explaining the nature of the study and its purpose, data was collected using structured self-administered questionnaire [11].

Data will be analysed according to the objective of the study using descriptive and inferential statistics and will be presented in the form of tables, graphs and diagrams.

From the randomized sample (n=150), a sub sample of n=75 were given a dietary intervention that involves a hand book on physical activity and a motivated counselling on benefits of physical exercise, and a hand book on low calorie diets and a detailed counselling on obesity related risk factors, low calorie foods and behaviour changes was given initially on the first day

following first Saturday of every month up to six months starting from June 2017 to November 2017.

Bio chemical and clinical assessments of the parameters like blood glucose, total cholesterol, triglycerides, HDL-C, LDL-C, and blood pressure were done before and after intervention.

RESULTS

The obtained results were pooled and analysed statistically.

Table No.1. Mean anthropometric measurements for four groups before and after the interventions

| S No | Particulars | Mean | df | SD | F value | p value |
|------|-----------------------------|-----------|-----|--------------|-----------------|----------|
| 1 | Weight(kgs) | | | | | |
| | A. Control B. Diet group | 6 3.16 | 2,9 | 0.40 2.01 | 404.68 3.10* | NS S |
| 2 | BMI | | | | | |
| | A. Control B. Diet group | 6.62 6 | 1,6 | 2.37 2.24 | 0.02 0.4 | NS NS |
| 3 | Waist Circumference(cms) | | | | | |
| | A. Control C. Diet group | 6.61 4 | 1,6 | 2.30 1.25 | 0.02 15.5* | NS S |

***significant at 0.05 level**

****significant at 0.01 and 0.05 levels**

***HS highly significant**

NS not significant

The number of sample that reduced their weight from the base line weights are 89 and the remaining 61 did not showed any weight reduction from the intervention. In the control group a total of 3 members have reduced their weight, in dietary intervention group 43 have reduced their weights The average weight lost during the intervention periods were $+_{.0.5}$ to 1 kgs in control, 2-2.25 kgs in dietary group, The weight loss is significant in dietary interventions [12].

The number of sample that reduced their BMI from the base line BMI is 30 and the remaining 120 did not

showed any reduction from the intervention. In the control group a total of 3 members have reduced their BMI, in dietary intervention group 27 have reduced their BMI, and The BMI reduction is not significant in the intervention and control group.

The number of sample that reduced their waist circumference from the base line is 48 and the remaining 102 did not showed any reduction from the intervention. In the control group a total of 5 members have reduced their waist, in dietary intervention group 43 have reduced their waist. The average waist circumference lost during the intervention periods were 2 to 3.5cms in control, 2.25 to 3.2 cms in dietary group. The waist circumference loss is significant in all interventions and is highly significant in combined intervention group.

TABLE NO. 2 BLOOD GLUCOSE LIPID PROFILE AND BLOOD PRESSURE VALUES OF THE SUBJECTS AFTER INTERVENTION

| S.No | Parameters | Mean | df | SD | F Value | Pvalue |
|------|-----------------------------|--------------|------|-------------|---------------|---------|
| 1 | BLOOD GLUCOSE | | | | | |
| | A. Control B Diet group | 6.62 9.37 | 1,6 | 2.37 9.4 | 0.02 1.08* | NS S |
| 2 | TOTAL CHOLESTEROL | | | | | |
| | A. Control B. Diet group | 6.25 | 2,9 | 3.75 | 15.90 | NS |
| 3 | TRIGLYCERIDES | | | | | |
| | A. Control B. Diet group | 6.25 | 2,9 | 3.10 | 18.45* | S |
| 4 | HDL=C | | | | | |
| | A. Control B Diet group | 6.25 | 2,9 | 3.39 | 4.18 | NS |
| 5 | LDL-C | | | | | |
| | A. Control B Diet group | 4.68 | 3,12 | 2.25 | 15.85* | S |
| 6 | BLOOD PRESSURE | | | | | |
| | A. Control B Diet group | 4.6 | 2,9 | 4.5 | 20.87* | S |

*significant at 0.05 level

**significant at 0.01 and 0.05 levels

*HS highly significant

NS not significant

The number of sample that showed decrease in the levels of glucose in blood are 2 in control, 13 in dietary

intervention. The decrease in the blood glucose levels are significant at 0.05 level..

The number of sample that showed decrease in the levels of total cholesterol in blood is 0 in control, 24 in dietary intervention. The decrease in the total cholesterol levels is not significant.

The number of sample that showed decrease in the levels of triglycerides in blood are 2 in control, 22 in dietary intervention. The decrease in the blood triglycerides levels is significant at 0.05 levels.

The number of sample that showed increase in the levels of HDL-C in blood are 2 in control, 19 in dietary intervention,. The increase in the blood HDL-C levels are significant at 0.05 levels in dietary intervention but are not significant in control group.

The number of sample that showed decrease in the levels of LDL-C in blood are 0 in control, 18 in dietary intervention. The decrease in the blood LDL-C levels are significant at 0.05 level.

The number of sample that showed decrease in the levels of pressure in blood is 0 in control, 8 in dietary intervention. The decrease in the blood pressure levels is significant at 0.05 levels.

SUMMARY AND CONCLUSIONS

From the above obtained results we can conclude that the dietary intervention showed limited increased results in the primary outcome weight loss and secondary outcomes decreased BMI, waist circumference and decreased blood lipid profile and blood glucose and blood pressure. Thus the dietary intervention is proved as effective strategy for weight loss when applied for longer periods.

Avoid over-eating and do changes to existing dietary habits for longer period to prevent obesity. An increase in the prevalence of obesity among all age groups as occurred in last 2-3 decades. About 30-50% of adults in

India are either over-weight or obese. The imbalance between energy intake and energy output leads to excess accumulation of fat in various parts of body causing obesity. Excessive body weight increases the risk of other health complications. Obesity leads to reduced levels of HDL and Triglycerides with abnormal increase in glucose and insulin levels in blood. Maintenance of desirable body weight for height avoids obesity and decreases the health complications like CVD, Hypertension and Diabetes.

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