IMPACT OF WEIGHT LOSS ON HEALTH COMPLICATIONS OF OBESE AND OVERWEIGHT IN URBAN PATNA

[1]Vidya, [2]Umapati Singh

[1]Research Scholar, [2]University Professor
[1]Department of Home Science,
Magadh University, Bodh Gaya, India

_____

Abstract: **Obesity is considered to be the fifth cause of death world-wide due to rapid changes in lifestyle. Many different dietary and exercise regimes have been found effective in reducing body weight and improving cardiovascular risk factors and blood glucose level, hypertension and nonalcoholic fatty liver diseases. In developing countries literature related to obesity is limited. Most of the obesity-related studies in India had been carried out in metropolitan cities. In this paper, it is aimed to study the association between health risk and obesity in a typical developing city of India, Patna. Review of health risks of obesity is important in order to increase the pool of available information in India and to draw attention to obesity and its attendant health risks. If weight reduction is carried out without involving physical workout then analysis based would reveal actual association between health risk and obesity, which has been done in this study. This study becomes has more relevance for old aged people because they have much restricted physical activity due to obvious reasons. It was revealed all the health complications under study: Anemia, Diabetes, High Cholesterol, high Blood TG level, high Blood TSH level, high SGPT level, high SGOT level, high Uric Acid level, high BP, low BP were significantly alleviated by weight loss in the participants. This gives a further scope of study to plan diet schedule for speedy recovery from health complications.**

Keywords: **Health, complication, obesity, overweight, weight loss.**

_____

1. INTRODUCTION

Obesity is one of the most important preventable diseases, and it is rapidly emerging in the developing world, and India is not different. Obesity is defined using the Body Mass Index (BMI), the standard definitions of being overweight and obese are in terms of BMI, overweight in the range 25–29.9, and obese in the range 30 or more. Malnutrition in India has always been synonymous with under-nutrition. Not anymore. Data from the latest round of the National Family Health Survey -4 (International Institute for Population Sciences and ICF, 2017) shows that obesity among adults is nearly as big a problem in the country as under-nutrition. Obesity is increasing at a fast rate in almost all parts of the country. The number of overweight and obese people in Bihar has almost doubled in 2016 as compared to 2006, NFHS-4 data shows, one in five people in Bihar weigh far more than they should. Obesity is a major risk factor for cardiovascular disease (Kopelman P, 2007). Obesity has major adverse medical consequences largely due to its health risks and association with hypertension (Kopelman P, 2007). The greater the BMI, the greater the health risks. People who are obese tend to have arthritis in the weight-bearing joints such as the knee, and that creates mobility problems which make them live a sedentary lifestyle, and they could eventually become more obese (Ogunbode AM, Fatiregun AA and Ogunbode OO, 2009).

Obesity in India has reached epidemic proportions in the 21st century, with morbid obesity affecting 5% of the country's population. There is, however scarcity of information on obesity in India, as literature is limited. Most of obesity related studies in India have been carried out in metropolitan cities. Review of health risks of obesity is important in order to increase the pool of available information in India and to draw attention to obesity and its attendant health risks. Patna typically represents developing cities of India and as urbanization is considered as a major cause of obesity (Ekezie J, Anyanwu EG, Danborno B and Anthony U, 2011), Patna may be considered to be perfect place for the study relating to obesity and health complications in urban India.

2.   Objective

Objective of the present study is to find empirical evidence, supporting associations between obesity and health risks among obese adults of Patna.

3.   Data And Source of Data

For the purpose two hundred (100 male & 100 female) over weight and obese adults (>18 years and <60 years of age) having BMI more than 25 kg/msq, from middle income group were selected, who were enrolled for weight loss in a weight loss program of duration six months, conducted by Vidya Diet Clinic, Patna. A pre-designed interview schedule was used to obtain the information from the overweight and obese adults. The interview schedule was divided into different sections like General information, Anthropometric Measurements, Bio chemical estimation, Medical history, Life style, Dietary assessment and food

habits and Follow up record chart for weight loss. After recording the medical & life style history of all enrolled overweight & obese subjects, they were counseled regarding the concept of moderate fat balanced nutrient reduction diet practices (Freedman MR, King J and Kennedy E. 2001). Simple dos and don'ts follow ups, eating right and healthy cyclic menu of 1450 kcal per day for female and 1650 kcal per day for male containing 55-60% of carbohydrates, 15% of protein, 25-30% of fat was given. Subjects were asked to visit clinic once in a week for diet counseling and change in cyclic menu. There was substantial weight losses in the people enrolled in the program during the six months. Various clinical parameters associated with health complications and anthropometric measurements were recorded at the joining of weight loss program and after weight loss, and these data sets were examined for justifying the hypotheses framed, which have been enormously studied in various parts of the world. Obviously data used was primary and cross sectional.

4.   Relevance of Study

In the weight loss program of duration six months, conducted by Vidya Diet Clinic, Patna, the mode of weight reduction is through following moderate fat, balanced nutrient reduction diets (Freedman MR, King J and Kennedy E, 2001), in which no physical exercise were advised to the participants. So any finding is only due to weight loss. This study becomes more relevant for old aged people because they have much restricted physical activity due to obvious reasons.

5.   Analysis Methodology

There are several clinical measures indicating health complications, for the sample group, people suffering from each health complication were examined for some of indicating clinical measure on the eve of joining and after six months of weight loss program. These paired observations form the basis of study. For example for anemia, hemoglobin count is accepted indicator.
All variables were checked for normality and it was found that none of the distribution was significantly skewed. The paired samples t-tests were carried out for each set of paired observation clinical measure obtained. The purpose of the test is to determine whether there is statistical evidence that the mean difference between paired observations on a particular outcome is significantly different from zero. There are several assumptions for this test, but researchers often follow a rule of thumb that size of group should be at least 6, ideally more. Inferences for the population will be more tenuous with too few subjects. Statistical analyses were performed using SPSS-PC (Statistical Package for Social Sciences, Version 25, IBM Inc.) Package.
The hypotheses examined for relevance were, there was significant positive impact on hemoglobin level, Average Blood Glucose (ABG) level, HDL Cholesterol level, LDL Cholesterol level, Total Cholesterol level, Blood TG level, Blood TSH level, SGPT level, SGOT level, Uric Acid level, High BP level & Low BP level through weigh reduction, among the people enrolled in the program, within six months.

6.   Analysis Results

As the sample was fairly large, so it may be concluded that 70% of obese and overweight females of urban Patna were anemic, 8.5% of obese and overweight people of urban Patna were suffering from hyperglycemia, 6% of obese and overweight people of urban Patna had high cholesterol level, 4% of obese and overweight people of urban Patna had high blood TG level, 20% of obese and overweight people of urban Patna had high blood TSH level, 11% of obese and overweight people of urban Patna had high SGPT & SGOT levels, 6.5% of obese and overweight people of urban Patna had high uric acid level, 9% of obese and overweight people of urban Patna had high BP problem and 17% of obese and overweight females of urban Patna had low BP problem in the reference period. The following Table-1 gives distribution of health complication in the sample.

Table-1: Distribution of health complication in the sample data.

Serial	Health Complication	Number of people in the sample suffering		
		Male	Female	Total
1	Anemia	2	68	70
2	Diabetes	10	7	17
3	High Cholesterol	9	3	12
4	High Blood TG level	6	2	8
5	High Blood TSH level	2	38	40
6	High SGPT level	13	9	22
7	High SGOT level	13	9	22
8	High Uric Acid level	11	2	13
9	High BP	7	11	18
10	Low BP	1	17	18

Statistical hypothesis testing revealed that among the people enrolled in the program, within six months by weight loss, increase in hemoglobin level was strongly significant among anemic people, decrease in Average Blood Glucose (ABG), SGPT & SGOT levels was strongly significant among respective suffering groups, decrease in total cholesterol, blood TG & Uric Acid levels was highly significant among respective suffering groups, decrease in blood TSH level was significant at 10% level of significance among people having high TSH level, decrease in BP level was highly significant among the people having high BP problem and increase in BP level was highly significant among the people having low BP problem. Here strongly significant means P-value obtained is 0.000 & highly significant means P-value obtained is not 0.000 but less than 1%. The following Table-2 gives crucial results obtained from the statistical analysis.

Table-2: Statistical Analysis Results.

Serial	Clinical Measure	Count after weight loss- Count at joining			
		Mean	Sample Size	Standard Error	P-value (two tailed)
1	Hemoglobin	0.54	70	0.076	0.000
2	Average Blood Glucose	-18	17	2.822	0.000
3	HDL Cholesterol	2.6	10	1.733	0.168
4	LDL Cholesterol	-11.625	8	3.717	0.017
5	Total Cholesterol	-20.75	12	5.737	0.004
6	Blood TG	-83.75	8	19.16	0.003
7	Blood TSH	-1.75	40	1.29	0.182
8	SGPT	-23.25	22	2.74	0.000
9	SGOT	-7.37	22	1.09	0.000
10	Uric Acid	-0.98	13	0.31	0.008
11	High BP	-8.11	18	3.6	0.038
12	Low BP	6.166	18	1.99	0.007

7.   Discussion:

As the study is contemporary the result of analysis can be granted true for current time also. The statistical analysis reveals that health complications under study: Anemia, Diabetes, High Cholesterol, high Blood TG level, high Blood TSH level, high SGPT level, high SGOT level, high Uric Acid level, high BP, low BP are significantly associated with obesity and these can be significantly alleviated by weight loss. Among the leading health risks that were assessed in the Global Burden of Disease 2015(Feigin, Valery L et al., 2015) study, high BMI continues to have one of the highest rates of increase. The reduced opportunities for physical activity that have followed urbanization and other changes in the built environment have also been considered as potential drivers; however, these changes generally preceded the global increase in obesity and are less likely to be major contributors. Although high BMI is a major risk factor contributing to years lived with disability globally, and the economic costs associated with treatment are substantial, these nonfatal but debilitating health outcomes have received comparatively little policy attention. Weight loss is beneficial in the prevention and treatment of many health complications.

Impaired functional iron status is mainly linked to adipose tissue inflammation and increased expression of the systemic iron regulatory protein hepcidin (Aigner E, Feldman A and Datz C, 2014). Body mass index has a strong relationship to diabetes and insulin resistance. In obese individuals, the amount of nonesterified fatty acids, glycerol, hormones, cytokines, proinflammatory markers, and other substances that are involved in the development of insulin resistance, is increased (Al-Goblan AS, Al-Alfi MA and Khan MZ, 2014). The fight against obesity as a major cause of cardio vascular disease morbidity and mortality will require major societal changes and the involvement of dieticians, and behavior modification specialists in clinical practice to reshape our physical activity and dietary habits (Després J-P, Arsenault BJ, Côté M, Cartier A, Lemieux I,2008; Souza LL, Guedes EP, Teixeira PF, Moreira RO, Godoy-Matos AF and Vaisman M., 2016). Fatty liver is very common and in many cases is linked to being obese or overweight (Dietrich, P and Hellerbrand, C. 2014). Adipose tissue can secrete uric acid and that the production of uric acid is augmented in obesity (Tsushima Y, Nishizawa H, Tochino Y, et al, 2013). Studies have shown that the rise of high blood pressure sufferers is seen in conjunction with a dramatic increase in the prevalence of overweight and obesity (Re RN, 2009).

8.   Conclusion:

In conclusion, our study provides a comprehensive assessment of the obesity and the associated health complications. Obesity appears to have a stronger association with the occurrence of health complications & reduced health-related quality of life. The rapid increase in the prevalence and disease burden of elevated BMI highlights the need for continued focus on surveillance of

BMI and identification, implementation, and evaluation of evidence-based interventions to address this problem. The present study reveals that weight loss resulted from moderate fat balanced nutrient reduction diet in the absence of physical exercise in over weight and obese people has been shown to produce substantial reduction in health complications. This diet proves safe and effective for many overweight patients who are unable to do exercise due to morbid obesity, disability and arthritis. This doesn't mean that diet management would replace medication and physical workout but diet management can help in faster recovery and stay healthy. It is needed to understand that the weight loss through controlled diets is to be followed not for few days, few weeks or few months, but rather form the basis of everyday healthy food choices throughout their life to sustain weight loss and prevent health complications. It is fast, convenient and inexpensive method. Increasing physical activity once the target weight is achieved through diet will keep weight and health complications stable in the long term.

9. Limitations:

A number of clinical measures are indicator of a particular health complication but only a few of them were considered for study. It is recommended that future studies related to the benefits of weight loss include wide range of relevant clinical measures in order to obtain more accurate conclusion.

10. Acknowledgment:

Reference:

[1]   Aigner E, Feldman A and Datz C. 2014. Obesity as an Emerging Risk Factor for Iron Deficiency, Nutrients. 6(9):3587-3600. doi:10.3390/nu6093587.

[2]   Al-Goblan AS, Al-Alfi MA and Khan MZ. 2014. Mechanism linking diabetes mellitus and obesity. Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy, 7:587-591. doi:10.2147/DMSO.S67400.

[3]   Després J-P, Arsenault BJ, Côté M, Cartier A and Lemieux I.2008. Abdominal obesity: The cholesterol of the 21st century? The Canadian Journal of Cardiology, 24(Suppl D):7D-12D.

[4]   Dietrich P and Hellerbrand C. 2014. Non-alcoholic fatty liver disease, obesity and the metabolic syndrome.Best Practice & Research Clinical Gastroenterology, 28 (4): 637-653.

[5]   Ekezie J, Anyanwu EG, Danborno B and Anthony U. 2011. Impact of urbanization on obesity, anthropometric profile and blood pressure in the Igbos of Nigeria. North American Journal of Medical Sciences, 3(5):242-246. doi:10.4297/najms.2011.3242.

[6]   Feigin, Valery L et al. Global, regional, and national burden of neurological disorders during 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. The Lancet Neurology , 16 (11) : 877 – 897.

[7]   Freedman MR, King J and Kennedy E. 2001. Popular diets: a scientific review. North American Association for the Study of Obesity (NAASO) 9 (suppl 1)), 1S-40S.

[8]   International Institute for Population Sciences (IIPS) and ICF 2017. National Family Health Survey (NFHS-4), India, 2015-16: Bihar. Mumbai: IIPS.

[9]   Kopelman P. 2007. Health risks associated with overweight and obesity. Obesity Reviews, 8(S1): 13-17.

[10] Ogunbode AM, Fatiregun AA and Ogunbode OO. 2009. Health Risks of Obesity. Annals of Ibadan Postgraduate Medicine, 7(2):22-25.

[11] Re RN. 2009. Obesity-Related Hypertension. The Ochsner Journal, 9(3):133-136.

[12] Souza LL, Guedes EP, Teixeira PF, Moreira RO, Godoy-Matos AF and Vaisman M. 2016. Serum TSH levels are associated with cardiovascular risk factors in overweight and obese adolescents. J Pediatr (Rio J), 2(5): 532- 538. doi: 10.1016/j.jped.2016.01.011. Epub 2016 Jun 22.

[13] Tsushima Y, Nishizawa H, Tochino Y, et al. 2013. Uric Acid Secretion from Adipose Tissue and Its Increase in Obesity. The Journal of Biological Chemistry, 288(38):27138-27149. doi:10.1074/jbc.M113.485094.