

A Cross Sectional Survey Determining the Prevalence and Risk Factors Associated With Obesity at a tertiary Cate Teaching Hospital

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ABSTRACT

Background: Obesity is one of the major modifiable risk factor that is associated with various diseases like type 2 diabetes mellitus, cardiovascular disease and few types of cancers. In recent years, obesity is becoming an epidemic worldwide, with different prevalence's across different population groups. The aim of the present study is to determine the prevalence and risk factors associated with obesity.

Materials and Methods: The study included a cross sectional survey conducted by the Department of General Medicine, KPC Medical College and Hospital, Jadavpur, Kolkata, West Bengal (India) during a period of 8 months. Complete demographic details were obtained from all the subjects including age, gender, marital status and socioeconomic status. Amount of physical activity of each subject was noted. Waist and hip measurements of all the subjects were obtained with an inextensible measuring tape which had a width of 1.0 cm. All the data was recorded in a predesigned proforma. All the obtained data was arranged in a tabulated form and analysed using SPSS software. Chi square test and student t test are used as test of significance. Probability value of less than 0.05 was considered significant

Results: A total of 300 subjects were enrolled in the study, out of these, 180 were non obese and 120 were obese. Amongst obese subjects, the BMI was 28.91 +/- 2.32 and non-obese subjects it was 21.05 +/- 1.12. There was a significant

difference in BMI amongst obese and non-obese subjects. The mean waist circumference amongst obese and non-obese subjects was 93.1 +/- 7.4 and 74.5 +/-5.8 respectively. There was a significant difference in the waist circumference amongst both the groups. There were 70 subjects who were between 20-35 years of age, out of these 35 were obese i.e. 50%.

Conclusion: From the above study the prevalence of obesity is high. Lack of physical activity and intake of fermentable carbohydrates are associated with increased risk of obesity. Gender, socioeconomic status and lipoprotein level also can influence the prevalence of obesity.

Keywords: Obesity, Prevalence, Physical activity, Risk.

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INTRODUCTION

Obesity is one of the major modifiable risk factor that is associated with various diseases like type 2 diabetes mellitus,¹ cardiovascular disease² and few types of cancers. In recent years, obesity is becoming an epidemic worldwide, with different prevalence's across different population groups.^{2,4} As per the data by National Health and Nutrition Examination in the 1999–2008 Survey, almost two-thirds of the adult population in the United States were classified as overweight and one-third of the adults were obese.⁵ The risk of cardiovascular disease increases several times when abdominal obesity is associated with dyslipidemia, hypertension or glucose intolerance leading to a metabolic syndrome.⁶

The prevalence and incidence of obesity and obesity-related disorders is increasing worldwide. According to the Center for Disease Control and Prevention, it was estimated that obesity

would cost the United States at least \$147 billion in the year 2008. Therefore, there has been a paradigm shift in the various policies and strategies to prevent obesity. Cardiovascular mortality is also increasing at a parallel rate with obesity in the developing countries.⁷

Obesity is a multifactorial process which involves interactions between genetic, environmental and psychosocial factors. Although obesity is considered to have genetic influences but dietary and lifestyle factors play an significant role in the increased prevalence of the disease in recent decades.⁸ Therefore, the identification of these specific risk factors that are associated with obesity is becoming an important healthcare strategy in the planning of various intervention programmes for the prevention of the same. The aim of the present study is to determine the prevalence and risk factors associated with obesity.

MATERIALS AND METHODS

The study included a cross sectional survey conducted by the Department of General Medicine, KPC Medical College and Hospital, Jadavpur, Kolkata, West Bengal (India) during a period of 8 months. The study was approved by the institute's ethical committee and all the subjects were informed about the study and a written consent was obtained from all in their vernacular language. The study consisted of subjects between 21-60 years of age. Subjects who were medically compromised, at terminal stage of disease, pregnant or lactating mothers were excluded from the study. Complete demographic details were obtained from all the subjects including age, gender, marital status and socioeconomic status. Amount of physical activity of each subject was noted. Waist and hip measurements of all the subjects were obtained with an inextensible measuring tape which had a width of 1.0 cm. For the measurements, individuals were made to stand upright and wear minimal clothing as possible. For obtaining waist

circumference, the measuring tape was placed on an imaginary line between the iliac crest and the last rib at the level of the umbilicus. The largest extension of the buttocks was used for hip measurement. It was taken care that the soft tissues were not pressed during measurement. The WHR was calculated by dividing the waist circumference from the hip circumference. Individuals with WHR ≥ 1.0 for men and ≥ 0.85 for women were considered obese. For the waist circumference, cut off points were ≥ 102 cm for men and ≥ 88 cm for women. Under complete aseptic conditions, 5ml of blood was withdrawn from antecubital vein and tested to determine the level of total cholesterol and total HDL. Patient's body mass index was evaluated by measuring the weight in kilograms and height in meters. All the data was recorded in a predesigned proforma. All the obtained data was arranged in a tabulated form and analysed using SPSS software. Chi square test and student t test are used as test of significance. Probability value of less than 0.05 was considered significant.

Table 1: Sociodemographic distribution and risk factors for obesity

VARIABLE	SUBGROUP	Non obese		obese		Total	P VALUE
		N=180	%	N=120	%		
GENDER	Males	73	40.6	47	39.2	120	>0.05
	Females	107	59.4	73	60.8	180	
MARTIAL STATUS	Married	125	69.4	64	53.3	189	>0.05
	Unmarried	55	30.6	56	46.7	111	
PAID WORK	Yes	118	65.6	41	34.2	159	<0.05
	No	62	34.4	79	65.8	141	
SOCIOECONOMIC STATUS	Upper class	68	37.8	31	25.8	99	>0.05
	Middle class	64	35.6	51	42.5	115	
	Lower class	48	26.7	38	31.7	86	
REGULAR PHYSICAL ACTIVITY	Yes	131	72.8	19	15.8	150	<0.05
	No	49	27.2	101	84.2	150	

Table 2: Mean value of variables amongst study group

VARIABLE	TOTAL	OBESE	NON OBESE	P VALUE
BODY MASS INDEX (kg/m ²)	25.65 +/-3.21	28.91 +/- 2.32	21.05 +/- 1.12	<0.05
WAIST CIRCUMFERENCE (cm)	84.2 +/- 8.7	93.1 +/- 7.4	74.5 +/-5.8	<0.05
HIP CIRCUMFERENCE (cm)	97.8 +/-6.9	103.4 +/-4.25	95.2 +/-5.3	<0.05
WAIST TO HIP RATIO	0.86 +/- 0.04	0.88 +/- 0.03	0.82 +/- 0.01	<0.05
TOTAL CHOLESTEROL (mmol/L)	5.23 +/- 0.88	5.32 +/- 1.25	5.21 +/- 1.32	>0.05
HIGH DENSITY LIPOPROTEIN (mmol/L)	1.37 +/-0.33	1.23 +/-0.43	1.45 +/- 0.26	<0.05

Table 3: Prevalence of obesity

VARIABLE (age)	NUMBER/%	P VALUE
20-35 (n=70)	35/50%	<0.05
36-50(n=110)	42/38.2%	
>51(n=120)	43/35.8%	

RESULTS

A total of 300 subjects were enrolled in the study, out of these, 180 were non obese and 120 were obese. Table 1 shows the sociodemographic data of the subjects enrolled in the study. There were 40.6% males and 59.4% females who were non obese. The rest 27 males and 73 females were obese. Amongst

189 married subjects, 125 were non obese and 64 were obese. There were 111 subjects who were unmarried, out of them 55 were non obese and 56 were obese. There was no significant difference of marital status and gender on the incidence of obesity. More of the subjects having paid work were non obese as compared to those who didn't had any paid work. There were 99

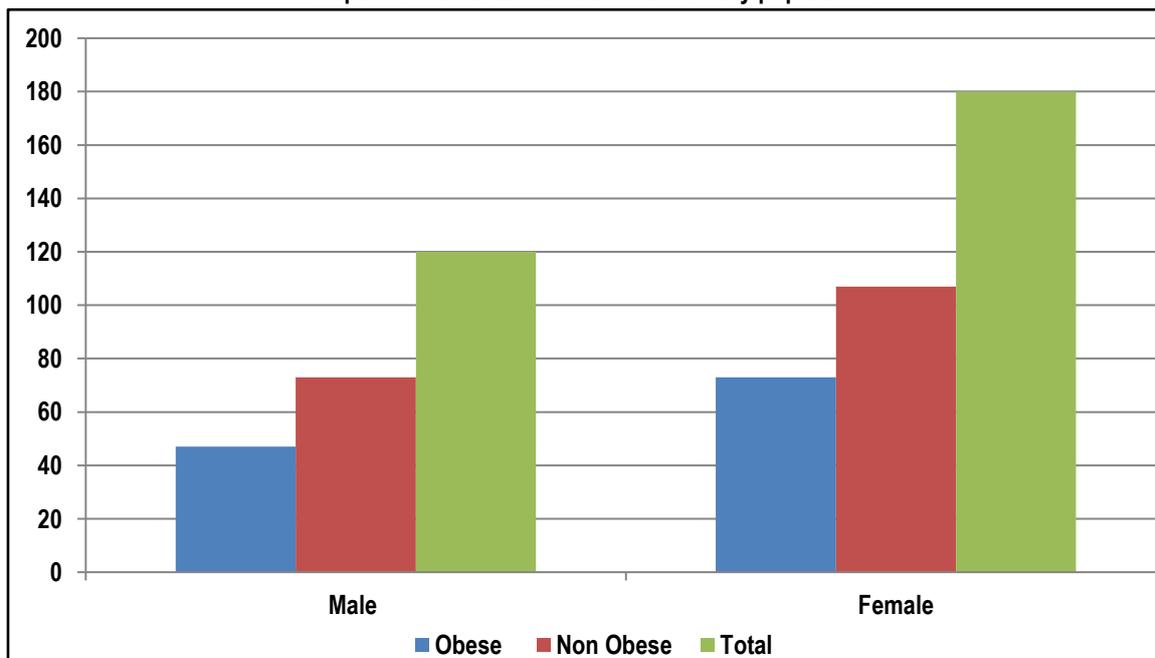
subjects who belonged to upper class, out of there 25.8% were obese. There were 115 subjects in middle class and amongst them 35.6% were non obese. In lower class, 26.7% were non obese and 31.7% were obese. There was a significant effect of physical activity on the incidence of obesity. 72.8% subjects who did regular physical activity were non obese compared to 84.2% subjects who didn't do any physical activity and were obese.

Table 2 denotes the difference in values of various variables used for assessment of obesity. The mean BMI amongst the subjects was 25.65 +/-3.21. Amongst obese subjects , the BMI was 28.91 +/- 2.32 and non-obese subjects it was 21.05 +/- 1.12. There was a significant difference in BMI amongst obese and non-obese subjects. The mean waist circumference amongst obese and non-obese subjects was 93.1 +/- 7.4 and 74.5 +/-5.8 respectively. There was a significant difference in the waist circumference amongst both the groups. Hip circumference also showed

significant difference amongst obese and non-obese subjects. The mean total was 97.8 +/-6.9 in the study. The waist to hip ratio amongst obese and non-obese subjects was 0.88 +/- 0.03 and 0.82 +/- 0.01 respectively. There was a significant difference amongst obese and non-obese subjects. There was no significant difference in the total cholesterol level between the subjects. The value of high density lipoprotein varies significantly amongst obese and non-obese subjects.

Table 3 denoted the prevalence of obesity. There were 70 subjects who were between 20-35 years of age, out of these 35 were obese i.e. 50%. There were 110 subjects who were aged between 36-50 years and amongst them 38.2% were obese. Amongst subjects who were more than 51 years of age, there were 35.8% (n=43) who were obese. On applying chi square test there was significant difference in the prevalence of obesity amongst different age group.

Graph 1: Gender wise distribution of study population



DISCUSSION

Most vulnerable to the epidemic of obesity worldwide are developing countries developing ^{9,10}. Most commonly middle aged adults especially women residing in urban and wealthy environment are affected in low income countries whereas in high income or developed countries both the genders are equally affected but the disadvantaged group is affected more.¹¹ Obesity has reached an alarming level of 25-82% in Eastern Mediterranean Region.

Various causes of obesity include urbanization, lack of proper food intake, sedentary lifestyle, short duration of breast feeding, skipping meals, frequent snacking, increased intake of junk food, high intake of sugary syrups etc.^{12,13} In our study, there were 70 subjects who were between 20-35 years of age, out of these 35 were obese i.e. 50%. There were 110 subjects who were aged between 36-50 years and amongst them 38.2% were obese. Amongst subjects who were more than 51 years of age, there were 35.8% (n=43) who were obese. On applying chi square test there was significant difference in the prevalence of obesity amongst different age group.

In a study conducted by Erem C et al¹⁴ in Turkey, there were 43% subjects above the age of 40 years who were obese and this was associated with age, parity, smoking status, household income, and physical activity. In a study conducted by Hajian-Tilaki KO et al¹⁵ in Iran, the prevalence of overweight and obesity amongst 7-12 year old school children were 5.8% and 12.3%, respectively. The incidence was significantly lower in girls compared to boys and students of private school were more commonly affected than public school. In a study conducted by Chew WF et al¹⁶, the prevalence of obesity was 40%. The obese participants also had a significantly lower high-density lipoprotein cholesterol level than the non-obese participants.

In our study, the mean BMI amongst the subjects was 25.65 +/- 3.21. Amongst obese subjects, the BMI was 28.91 +/- 2.32 and non-obese subjects it was 21.05 +/- 1.12. There was a significant difference in BMI amongst obese and non-obese subjects. The mean waist circumference amongst obese and non-obese subjects was 93.1 +/- 7.4 and 74.5 +/-5.8 respectively. There was a significant difference in the waist circumference amongst both the groups. Hip circumference also showed significant difference

amongst obese and non-obese subjects. The mean total was 97.8 +/-6.9 in the study. The waist to hip ratio amongst obese and non-obese subjects was 0.88 +/- 0.03 and 0.82 +/- 0.01 respectively. There was a significant difference amongst obese and non-obese subjects. There was no significant difference in the total cholesterol level between the subjects. The value of high density lipoprotein varies significantly amongst obese and non-obese subjects. In a study by Chew WF et al¹⁶ there was a higher proportion of individuals aged between 22-33 years who were obese. There were few limitation of our study, these include smaller sample size and the patient's blood sugar and blood pressure were not estimated. But since obesity is an attributable risk factor for various diseases, these things should be measured.

CONCLUSION

From the above study the prevalence of obesity is high. Lack of physical activity and intake of fermentable carbohydrates are associated with increased risk of obesity. Gender, socioeconomic status and lipoprotein level also can influence the prevalence of obesity.

REFERENCES

1. Chan JM, Rimm EB, Colditz GA, Stampfer MJ, Willett WC. Obesity, fat distribution, and weight gain as risk factors for clinical diabetes in men. *Diabetes Care* 1994; 17:961-9.
2. Poirier P, Giles TD, Bray GA, et al. Obesity and cardiovascular disease: pathophysiology, evaluation, and effect of weight loss: an update of the 1997 American Heart Association Scientific Statement on Obesity and Heart Disease from the Obesity Committee of the Council on Nutrition, Physical Activity, and Metabolism. *Circulation* 2006; 113:898-918.
3. Steffen A, Schulze MB, Pischon T, et al. Anthropometry and esophageal cancer risk in the European prospective investigation into cancer and nutrition. *Cancer Epidemiol Biomarkers Prev* 2009; 18:2079-89.
4. Seidell JC. Obesity, insulin resistance and diabetes-a worldwide epidemic. *Brit J Nutr* 2000; 83:S5-8.
5. Flegal KM, Carroll MD, Ogden CL, Curtin LR. Prevalence and trends in obesity among US adults, 1999-2008. *JAMA* 2010; 303:235-41.
6. Sposito AC, Caramelli B, Fonseca FAH, Bertolami MC, Afune Neto A, Souza AD, et al / Sociedade Brasileira de Cardiologia. IV Diretriz brasileira sobre dislipidemias e prevenção da aterosclerose: Departamento de Aterosclerose da Sociedade Brasileira de Cardiologia. *Arq Bras Cardiol*. 2007;88 (supl.1): 2-19.
7. Yusuf S, Reddy S, Ounpuu S, Anand S. Global burden of cardiovascular diseases: part I: general considerations, the epidemiologic transition, risk factors, and impact of urbanization. *Circulation* 2001; 104:2746-2753.
8. Kopelman PG. Obesity as a medical problem. *Nature* 2000; 404:635-43.
9. Friedrich MJ. Epidemic of obesity expands its spread to developing countries. *JAMA* 2002; 287:1382-6.
10. Reddy KS, Yusuf S. Emerging epidemic of cardiovascular disease in developing countries. *Circulation* 1998; 97:596-601.
11. Swinburn BA, Sacks G, Hall KD, McPherson K, Finewood DT, Moodie ML, et al. The global obesity pandemic: shaped by global drivers and local environments. *Lancet* 2011; 378: 804-14
12. Musaiger AO. Overweight and Obesity in the Eastern Mediterranean Region: can we control it? *Eastern Mediterranean Health Journal*, 2004;10(6).
13. Musaiger AO, Overweight and Obesity in Eastern Mediterranean Region: Prevalence and Possible Causes. *Journal of Obesity*. 2011; 407237:1-17.
14. Erem C, Arslan C, Hacıhasanoglu A, Deger O, Topbas M , Ukinc K, et al. Prevalence of Obesity and Associated Risk Factors in a Turkish Population . *Obesity Research* 2004;12(7).
15. Hajian-Tilaki KO, Sajjadi P, Razavi A. Prevalence of overweight and obesity and associated risk factors in urban primary-school children in Babol, Islamic Republic of Iran. *EMHJ*, 2011;17(2).
16. Chew WF, Masyita M, Leong PP, Boo NY, Zin T, Choo KB, Yap SF. Prevalence of obesity and its associated risk factors among Chinese adults in a Malaysian suburban village. *Singapore medical journal*. 2014 Feb;55(2):84.

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