

## ORIGINAL RESEARCH

# Lipid Profile Of Obese Adult Females of Urban Slum Area, Nagpur, India

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## ABSTRACT

**Introduction:** Overweight and obesity are a significant health disparity that disproportionately affects women. Hyperlipidemia is commonly ascribed to obesity.

**Aim:** To study the burden of preobesity and obesity and lipid profile of obese urban adult females.

**Material and Methods:** A community based cross sectional study was carried out from Nov 2007 to May 2009 to find out the prevalence of preobesity and obesity in adult urban females. Total 553 adult females were enrolled. Lipid profile of 111 females was done by selectra auto analyser. The data was analyzed by epi info version. Statistical analysis was done by chi-square test and percentage.

**Result:** Prevalence of preobesity and obesity was found to be 17.18% and 6.5% respectively. Association between TG value and VLDL value with obesity was found to be statistically significant ( $p < 0.05$ ).

**Conclusion:** As a disease, obesity is complex and its solutions too are difficult. The epidemic of obesity needs to be tackled at several levels: the individual level, the community level, and the government level.

**Key words:** Burden, Epidemic Lipid profile, Obesity, Preobesity.

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## INTRODUCTION

Obesity is a vexing problem in the developed economies. For developing countries like India, morbid obesity has not yet become a public health priority.<sup>1</sup> Obesity identified as nutritional disorder, thirty years ago and still continues to be one of the most important, yet preventable health hazards.<sup>2</sup> As obesity is a life threatening problem, giving rise to various complications, ways and means of reducing the occurrence of obesity need to be explored.<sup>3</sup>

Obesity may be defined as an abnormal growth of the adipose tissue due to an enlargement of fat cell size (hypertrophic obesity) or an increase in fat cell number (hyperplastic obesity) or a combination of both.<sup>4</sup> This global epidemic is related to increased mortality and morbidity rates with excess body fat being a significant risk factor for a number of chronic disorders such as CVD, NIDDM, gout, gall stones, intestinal blockage, kidney disease, sleep apnoea, hernia and arthritis, it also increases the likelihood of back ache and flat foot.<sup>5</sup> It was found that BMI of 26 or more is a significant risk factor for diabetes & BMI more than 30 was significantly associated with arthritis & hypertension.<sup>6</sup>

Menopausal women have higher rate of obesity, because menopausal women continue to have low levels of circulating estrogens, principally from peripheral aromatization of ovarian and adrenal androgens. Adipose tissue is a major site of aromatization, so obesity affects many of the sequel of menopause.<sup>7</sup>

Obesity can be seen as the first wave of a defined cluster of NCDs now observed in both developed and developing countries. This has been called the "New World syndrome". Obesity is a complex and incompletely understood disease. Obesity is not just an individual problem. It is a population problem and should be tackled as such.<sup>8</sup> Its prevalence is also increasing in urban

slum area.

Obesity negatively impacts the health of women in many ways. Being overweight or obese increases the relative risk of diabetes and coronary artery disease in women. The menopause is associated with a tendency to gain weight. Several alterations in fat deposits occur, leading to changes in the distribution of body fat. There are strong indications that, in middle age, obesity is associated with increased mortality. Keeping this in mind the present cross sectional study was carried out to know prevalence of obesity among urban slums adults females and to find out its association with lipid profile.

**MATERIALS AND METHOD**

The present community based cross sectional study was conducted from Nov 2007- May 2009 at Urban Health Training Centre attached to NKPSalve institute of medical sciences and research centre, Nagpur. Based on the prevalence of obesity (10%)<sup>5</sup> a sample of 553 was calculated with an absolute error of 2.5% by using this formula  $4pq/l^2$ , where p is the prevalence of obesity (10%), q is (100-p), l is absolute error (2.5). A house to house survey was done. Assessment of obesity was done according to W.H. O. classification of BMI (Kg/m<sup>2</sup>).

Classification	BMI	Risk of Co morbidities
Underweight	< 18.50	Low (but risk of other clinical problems increased)
Normal Range	18.50-24.99	Average
Overweight :	≥25.00	
Pre-Obese	25.00-29.99	Increased
Obese Class I	30.00-34.99	Moderate
Obese Class II	35.00-39.99	Severe
Obese Class III	≥40.00	Very severe

The classification of overweight and obesity according to W.H.O.<sup>4</sup>

**B.M.I.:** B.M.I. is defined as weight in Kg. divided by square of height in meters & measured in Kg/m<sup>2</sup>. Females suffering from pathological oedema, Cushing syndrome any hormonal disorder and pregnant females were excluded from the study.

The general and systemic examination of the patient was done at UHTC. Lipid profile was done on every 5<sup>th</sup> sample subject at tertiary care hospital.

**METHOD OF SERUM LIPID ANALYSIS**

A Blood Sample was drawn between 7.00 a.m. and 9.00 a.m. hours into ria vials from 111 study subjects after a 12-14 hours overnight fast at Urban Health Training Centre in a sitting position and centrifuged for 10 minutes within 30-45 minutes of collection. All blood analysis was done at Tertiary Care Hospital on the day of blood collection. The analysis of sample was performed using a Selectra Auto Analyser. Total Cholesterol, triglyceride and HDL level were

estimated. The VLDL and LDL cholesterol was estimated by using following formula:

$$VLDL_{CH} = \text{Triglyceride} / 5, \quad LDL_{CH} = \text{Total Cholesterol} - (VLDL_{CH} + HDL_{CH})$$

The following values were used for analysis: Total Cholesterol Desirable- up to 200mg/dl Borderline 200-239mg/dl., High cholesterol >240 mg/dl

Triglyceride, 35-135mg/dl. HDL Cholesterol Up to 60mg/dl, LDL Cholesterol 130mg/dl VLDL Cholesterol 40mg/dl .

**STATISTICALLY ANALYSIS**

Statistically analysis was done by Epi Info Version 3.4.1. using chi –square, Fissure exact test and percentage statistics.

**RESULTS**

It has been observed in present study that percentage of pre-obesity and obesity was 17.18% and 6.5% respectively. 57.32% study

S.N.	BMI	Study subject	Percentage
1	<18.5	105	18.98
2	18.5 -24.99	317	57.32
3	25-29.99	95	17.18
4	30-34.99	26	4.71
5	35-39.99	9	1.63
6	≥40	1	0.18
7	TOTAL	553	100

**Table-1-** Distribution of study subject according to BMI (n=553)

Study subject	No. of subjects	Normal Value	Chl >200	TG >135	LDL >130	HDL >60	VLDL >40
Non obese	64 (57.66%)	48 (75%)	8 (12.5%)	3 (4.68%)	7 (10.93%)	0	0 (0%)
Pre obese	31 (27.93%)	22 (70.96%)	2 (6.45%)	3 (9.67%)	3 (9.67%)	0	1 (3.22%)
obese	16 (14.41%)	7 (43.75%)	4 (25%)	10 (62.5%)	2 (12.5%)	0	4 (25%)

**Table No-2:** Distribution of study subjects according to Lipid Profile (n=111)

Multiple responses were allowed.

S.N.	Study subject	Triglyceride		
		Normal	Elevated	Total
1	Nonobese	61	3	64
2	Preobese&obese	34	13	47

$X^2=9.80, p=0.0017$

**Table No-3:** Association between obesity & triglyceride (n = 111)

	Study subjects	VLDL Value		
		Elevated	Normal	Total
1	Nonobese	0	64	64
2	Preobese&obese	5	42	47

Fisher exact test  
P = 0.0119684

**Table No-4:** Association between obesity& VLDL value (n=111)

subjects belonged to normal weight category and 18.98% of them were under weight category (Table-1). Out of 111 study subjects 64 (57.66%) were nonobese, 31(27.93%) were preobese and 16 (14.41%) were obese. Present study revealed that 9.67% preobese, 62.5% obese subjects had triglyceride value more than 135mg/dl. LDL was elevated in 9.67% preobese 12.5% obese subjects. HDL value was not elevated in any of study subjects.VLDL value was elevated in 3.22% preobese, 25% obese and study subjects (Table-2). Table no 3 shows association between obesity and triglyceride value. The association

between TG value with pre obese and obese subjects were found to be statistically significant (chi square test was applied was applied) ( $x^2=9.80, p<0.05$ ). Table-4 shows association between obesity and VLDL value and was also found to be statistically significant (Fissure exact test=0.0119684). Cholesterol was elevated in 6.45% pre-obese and 25% obese subjects. However association between elevated cholesterol and pre-obesity and obesity was not found to be statistically significant. ( $x^2=0.000, p=0.966$ )

## DISCUSSION

This community based cross sectional study was carried out at urban health training centre of NKP Salve Institute of medical sciences and research centre, Nagpur. 553 study subjects were examined in the study. Maximum number of study subjects belonged to 19-28 years of age groups. It has been observed in present study that percentage of pre-obesity and obesity was 17.18% and 6.5% respectively.

HC Shukla et al (2002)<sup>9</sup> mentioned that 22.7% of urban Mumbai women were pre-obese. 6.8% of women had grade I & II obesity and 0.2% had grade III obesity. Findings were similar to our study. Pragati Chhabra et al (2007)<sup>10</sup> observed that 21.7% and 7.7% urban females of Delhi were pre-obese and obese. This is near to finding of our study. In our study obesity was more prevalent among women aged 39-48 years. A Mishra et al (2001)<sup>11</sup> observed that there was a significantly increasing trends in the prevalence of obesity as age advances in urban women of northern India, the highest being in 51 year and above age. Finding was close to our finding. In our study lipid profile was done in 20% of sub sample of study subject. Out of 553 study subjects 111 were selected by systematic random sampling. Due to feasibility of the study and to avoid selection bias 111 study subjects were enrolled, as it was not feasible to investigate all the 553 study subjects. A significant association was observed between obesity and triglyceride value and VLDL value. In our study mean HDL value LDL value and Tg value among obese was found to be 52.1, 137.4, 142.2 respectively. M. Gopichand et al (2007)<sup>12</sup> showed that mean HDL value, LDL value and Tg value among pre-obese female was 64.18 (SD 4.24), 152.62 (SD33.28) and 216.81 (SD35.05) respectively. The findings were not coherent with the present study. Possible reason may be that our study was conducted on lower socioeconomic group while study by M. Gopichand et al might have been conducted on different socioeconomic study group. Yekeen LA et al (2003)<sup>13</sup> observed that hyper cholesterol was found in 7.8% obese hypertensive female study subjects. Findings were not similar to our study. In our study cholesterol was elevated in 6.45% pre-obese and

25% obese study subjects. SunandaSharan et al (2006)<sup>14</sup> observed that mean value of serum triglyceride, cholesterol and random blood sugar were found to be high in case of women with upper body obesity. In our study mean value of serum triglyceride and cholesterol was found to be 142.2 and 234.42 in obese females respectively. These finding were coherent with the present study. Within its limitation study suggested that appreciable prevalence of obesity, dyslipidaemia in females need immediate attention in terms of prevention and health education. Accurate risk perception, education and translation programs highlighting obesity risks and supporting sustainable lifestyle changes are needed, particularly around menopause. Obesity isn't necessarily a permanent condition. Diet, exercise, medications and even surgery can lead to weight loss. Yet it is much harder to lose weight than it is to gain it. Prevention of obesity, beginning at an early age in females and extending across a lifespan could vastly improve individual and public health.

## CONCLUSION

Thus it can be concluded that obesity is associated with the abnormal lipid profile in perimenopausal group of females. Correlation of lipid profile would have been seen with physical activity, intake of fatty diet and use of oral contraceptive. There is need of future research to observe the correlation of lipid profile with parameters like physical activity, fatty diet and use of oral contraceptive.

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