

Study of Lipid Profile in Obese and Non-Obese SubjectDharmishtha Dodiya¹, Hina Banker²**ABSTRACT**

Introduction: The lipid profile is a blood test done to assess the status of fat metabolism in the body. This includes measuring lipids (fats) and its derivatives known as lipoproteins. Lipoproteins are compounds containing fat and proteins and include free cholesterol, cholesterol esters, triglycerides, phospholipids and Apoproteins. **Objective:** To study the alteration of lipid profile in obese patient and to evaluate the lipid profile in non-obese and obese patient in different age

Material & methods: The study was carried out in Physiology department of Smt.N.H.L.M.Medical College & V.S. general hospital, during a time period from June 2008 to November 2010. Total sixty five obese subjects, coming for health check up at our institute ,were selected for this study .The age group of subjects is between 20-70 yrs.

Results and Conclusion: For these study total 100 cases were taken out of which 65 are obese and 35 were non-obese. From our study it is quite evident that majority of obese are above 40 yrs of age. In both the group males are more than females it could be possible that males may go in for investigations earlier as compared to females.

Keywords Lipid Profile, Non obese ,Obese

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Conflict of interest: Nil

INTRODUCTION

The lipid profile is a blood test done to assess the status of fat metabolism in the body. This includes measuring lipids (fats) and its derivatives known as lipoproteins. Lipoproteins are compounds containing fat and proteins and include free cholesterol, cholesterol esters, triglycerides, phospholipids and Apoproteins.

The blood is analyzed by the laboratory to determine the levels of:

- Total cholesterol
- Triglycerides
- HDL (high density lipoprotein) cholesterol
- LDL (low density lipoprotein) cholesterol
- Serum VLDL (very low density lipoprotein) cholesterol

Obesity is a multifactor disorder and its development is due to multiple interaction between genes and environment. The primary cause for being overweight and obese is unhealthy dietary habits, reduced physical activities as well as the genetic predisposition^{1,2}.

The global epidemic of overweight and obesity –“globesity “is rapidly becoming a major public health problem in many parts of the world. Rapidly changing diets and lifestyles are fueling the global obesity epidemic³. It is associated with an increased risk of developing various non-communicable diseases (NCDs), including hypertension, coronary heart disease, diabetes, stroke and some forms of cancer⁴. These diseases occur a decade earlier in Indians and affect even poorer segment of population and also those in rural areas⁵

For most of human history mankind struggled with food scarcity⁶ Obesity has thus historically been viewed as a sign of wealth and prosperity.

With the onset of the industrial revolution it was realized that the military and economic might of nations were dependent on both the body size and strength

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of their soldiers and workers⁷ Increasing the average body mass index from what is now considered underweight to what is now the normal range played a significant role in the development of industrialized societies⁷. Height and weight thus both increased through the 19th century in the developed world. During the 20th century, as populations reached their genetic potential for height, weight began increasing much more than height, resulting in obesity⁷. In the 1950s increasing wealth in the developed world decreased child mortality, but as body weight increased heart and kidney disease became more common.

AIMS AND OBJECTIVES

- To study the alteration of lipid profile in obese patient
- To evaluate the lipid profile in non-obese and obese patient in different age

MATERIAL AND METHODS:

The study was carried out in Physiology department of Smt.N.H.L.M.Medical College & V.S. general hospital, during a time period from June 2008 to November 2010. Total sixty five obese subjects, coming for health check up at our institute ,were selected for this study .The age group of subjects is between 20-70 yrs.

Thirty five non-obese volunteers between age group of 20-70 were selected for control or comparison of the study.They are non-smokers,not taking tobacco and free from any metabolic disorders.

Inclusion criteria: Subject with

- 1) BMI 30 or more than 30 are taken as obese.
- 2) BMI less than 30 is taken as non-obese.
- 3) Age group between 20 to70 of both the sexes are selected.
- 4) who are selected as non-obese were non-smokers and non-tobacco chewers.

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Exclusion criteria: Subjects

- 1) Taking lipid lowering agents.
- 2) With hypothyroidism.
- 3) Taking oral contraceptive pills.
- 4) With any metabolic disorder affecting lipid profile

Biochemical Measurement was done in the form of Serum cholesterol (mg %), Serum triglyceride (mg%): Serum HDL (mg%): Serum LDL (mg%): Serum VLDL (mg%): LDL/HDL ratio : Serum cholesterol, serum triglyceride and serum HDL were estimated by enzymatic method and value of S. LDL, S.VLDL were calculated by the Friedewald formula. $VLDL = TG/5$, $LDL = Total\ cholesterol - HDL - TG/5$. The results are expressed as mg/dl

RESULTS & DISCUSSION

Following observations were made from the study of lipid profile in 65 obese subjects. All were divided in following age groups,

Table 1: Study Population As Per Age Group

Age group(yrs)	Frequency	Percentage
20-30	6	9.24
31-40	10	15.38
41-50	18	27.69
51-60	27	41.54
61-70	4	6.15
Total	65	100%

TABLE – 2 Study Population As Per gender of the group

Gender group	Frequency	Percentage
Male	34	52.31
Female	31	47.69
Total	65	100%

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TABLE 3 : Shows height of the study group

Height group (cms)	Frequency	Percentage
130-140	6	9.23
141-150	18	27.69
151-160	28	43.07
161-170	12	18.47
171-180	1	1.54
Total	65	100%

TABLE – 4: Study Group according to weight

Weight (kgs)	Frequency	Percentage
51-60	1	1.54
61-70	17	26.15
71-80	31	47.69
81-90	13	20
91-100	3	4.62
Total	65	100

TABLE – 5 BMI group

BMI group	Frequency	Percentage
30-34.9	57	87.69
35-39.9	5	7.69
40-44.9	3	4.62
Total	65	100%

TABLE 6 Classification as per style group

Life style group	Frequency	Percentage
Sedentary	24	36.92
Moderately active	34	52.31
Active	7	10.77
Total	65	100%

Following observation were made from the study of lipid profile in 35 non obese subjects. All the subjects were divided into following age groups

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TABLE -7: Control Group Classification: Age Wise

Age groups (yrs)	Frequency	Percentage
20-30	10	28.57
31-40	10	28.57
41-50	6	17.15
51-60	5	14.28
61-70	4	11.43
Total	35	100%

TABLE – 8: Control Group Classification: Gender groups

Sex groups	Frequency	Percentage
Male	23	65.72
Female	12	34.28
Total	35	100%

TABLE 9: Control Group Classification : height groups

Height groups	Frequency	Percentage
131-140	0	0
141-150	2	5.72
151-160	12	34.28
161-170	15	42.86
171-180	6	17.14
Total	35	100%

TABLE 10: Control Group Classification: weight groups

Weight group	Frequency	Percentage
46-55	3	8.57
56-65	19	54.28
66-75	9	25.72
76-85	4	11.43
Total	35	100%

TABLE 11: Control Group Classification: BMI groups

BMI groups	Frequency	Percentage
20-24.9	21	60
25-29.9	14	40
Total	35	100%

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TABLE: 12 Life style groups

Life style group	Frequency	Percentage
Sedentary	5	14.28
Moderately active	17	48.57
Active	13	37.15
Total	35	100

TABLE – 13: Physical parameters of obese subjects showing mean ,S.D., minimum and maximum values

Parameters	Mean	S.D.	Minimum value	Maximum value
Age (yrs)	47.98	11.31	20	68
Height (cms)	154	.088	134	173
Weight	76.85	7.85	56	97
BMI	32.13	2.78	30.04	43.11

TABLE – 14: Physical parameters of non-obese subjects showing mean ,SD, minimum and maximum values

Parameters	Mean	S.D.	Minimum value	Maximum value
Age (yrs)	40.77	14.55	20	70
Height (cms)	1.63	.081	147	179
BMI	64.66	7.83	50	81
BMI	24.05	2.30	20.20	27.92

TABLE – 15 Table shows Serum cholesterol in obese and non obese

S.Cholesterol	Obese	Non -obese
001-100	00	01
101-200	20	29
201-300	42	05
301-400	02	00
401-500	01	00
Total	65	35

Majority of cases i.e.65% of obese showed high S..Cholesterol ,while in non-obese only 14% showed high s. Cholesterol.Thus a significant difference in S.Cholesterol level in obese and non-obese ($P<0.05$).

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TABLE – 16: Serum triglyceride in obese in non obese

S.triglyceride	Obese	Non –obese
10-190	32	32
200-250	14	2
251-300	8	0
301-350	6	0
>350	5	01
Total	65	35

As the above table shows ,51% of obese subjects, while only 9% of non-obese subjects showed high level of S.Triglyceride. Thus a significant difference is observed in S.Triglyceride.

TABLE – 17 Shows Serum HDL in obese and non-obese

S.HDL	Obese	Non –obese
<34	10	4
35-60	50	27
>60	5	4
Total	65	35

As the above table shows 10% of obese subjects showed ,while only 6% of non-obese showed low level of S.HDL. There is not a significant difference in S.HDL in obese and non-obese.

TABLE – 18 Shows Serum LDL in obese and non-obese

S.LDL	Obese	Non -obese
40-100	17	18
101-160	29	15
>160	19	2
Total	65	35

As the above table shows 30% Of obese subjects showed high level of S.LDL, while in non-obese only 5% Showed high level of S.LDL. Thus a significant difference is observed in S.LDL in obese and non-obese.

TABLE 19: Serum VLDL in obese and non-obese

S.VLDL	Obese	Non –obese
<20	13	11
20-40	26	17
>40	36	07
Total	65	35

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Majority of obese i.e.55% showed high level of S.VLDL.while in non-obese only 20% showed high S.VLDL level. Thus a significant difference is observed in S. VLDL in obese and non-obese ($P<0.05$).

TABLE 20: Ratio of LDL/VLDL in obese and non-obese

LDL/HDL ratio	Obese	Non –obese
< 1.5	02	05
1.5-3.5	44	29
>3.5	19	01
Total	65	35

In obese subjects 29% showed increased in LDL/HDL ratio as compared to only 3% in non-obese.

TABLE- 21: Lipid profile in obese and non- obese

LIPID PROFILE		OBESE	NON OBESE	P VALUE
S. CHOLESTEROL	MEAN	222.91	163.96	.000
	S.D.	48.65	30.65	
S.TRIGLYCERIDE	MEAN	186.03	126.55	.000
	S.D.	108.62	60.94	
HDL	MEAN	46.20	46.26	.982
	S.D.	13.23	11.11	
LDL	MEAN	135.54	97.54	.000
	S.D.	56.90	33.84	
VLDL	MEAN	47.44	37.19	.109
	S.D.	25.96	36.82	
LDL/HDL RATIO	MEAN	3.13	2.15	.000
	S.D.	1.47	.80	

There is a significant difference in S.Cholesterol, S.Triglyceride,S.LDL and LDL/HDL ratio in obese and non-obese subject.there is not a significant difference in S. HDL and S. VLDL in obese and ono-obese dubejects.

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TABLE – 22: Comparing lipid profile in obese with different life style

Sr.No.	Lipid Profile		Life Style			P value
			A	MA	S	
1	S.cholesterol	Mean	176.67	198.84	229.62	.0009
		S.D.	29.91	51.15	54.64	
2	S.Triglyceride	Mean	160.14	185.31	209.30	0.2954
		S.D.	103	103	123	
3	S.HDL	Mean	43.26	47.98	44.52	0.5172
		S.D.	8.2	15.98	9.6	
4	S.LDL	Mean	113.85	126.45	155.01	0.0943
		S.D.	35.45	65.04	44.19	
5	S.VLDL	Mean	54.34	44.47	49.63	0.5816
		S.D.	24.10	27.33	24.89	
6	LDL/HDL ratio	Mean	2.64	2.82	3.72	0.0431
		S.D.	0.72	1.42	1.56	

TABLE 23: Comparing S.Cholesterol in obese and non-obese in different age groups

Sr.no.	Age groups (yrs)		Serum cholesterol		P value
			Mean	S.D.	
1	20-40	Obese	195.96	29.67	0.6082
		Non obese	164.85	36.30	
2	41-60	Obese	232.83	50.42	0.0001
		Non obese	158.91	22.61	
3	61-70	Obese	19.1	58.59	0.1424
		Non obese	167.35	18.08	

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TABLE – 24: Comparing S.Triglyceride in obese and non – obese with different age groups

Sr.no	Age groups (yrs)		Serum Triglyceride		P value
			Mean	S.D.	
1	20-40	Obese	194.03	107.50	0.0073
		Non-obese	139.54	66.63	
2	41-60	Obese	214.70	102.26	0.0041
		Non –obese	122.40	36.12	
3	61-70	Obese	230.45	79.78	0.933
		Non -obese	128	64.80	

TABLE -25: Comparing S.HDL in Obese and Non –Obese With Different Age Groups

Sr.No.	Age groups (yrs)		Serum HDL		P value
			Mean	S.D.	
1	20-40	Obese	43.16	9.44	0.2074
		Non obese	47.94	13.01	
2	41-60	Obese	45.85	9.74	0.5878
		Non obese	44.18	5.49	
3	60-70	Obese	44.52	16.03	0.8566
		Non obese	43.55	13.47	

TABLE -26: Comparing S.LDL in Obese And Non –Obese With Different Age Groups

Sr. no	Age groups (yrs)		Serum LDL		P value
			Mean	S.D.	
1	20-40	Obese	111.04	36.94	0.2023
		Non obese	95.14	36.12	
2	41-60	Obese	143.86	61.12	0.0141
		Non obese	95.15	33.40	
3	61-70	Obese	127.15	48.10	0.6913
		Non obese	116.12	21.99	

CONCLUSION

For this study total 100 cases were taken out of which 65 are obese and 35 were non-obese. From our study it is quite evident that majority of obese are

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above 40 yrs of age. In both the group males are more than females it could be possible that males may go in for investigations earlier as compared to females. The mean height of obese is less as compared to non-obese. Mean weight of obese is more than non-obese. The life style of both group is similar except percentage of non-obese with active life style are more as compared to obese.

REFERENCES

1. Kelishadi R. childhood overweight ,obesity and metabolic syndrome in developing countries. *Epidemiol. rev.* 2007,8,3,191-196
2. Wilkinson, Richard; Pickett, Kate (2009). *The Spirit Level: Why More Equal Societies Almost Always Do Better*. London: Allen Lane. pp. 91–101
3. "WHO: Obesity and overweight". World Health Organization. Retrieved January 10, 2009.
4. Khan, A.M., Dutta P. ,Khan, S.A. and Mahanta, J.A focus of lymphatic filariasis in a tea workers community of central Assam *J. Environ . Biol* 25,437-440.
5. Michelle A.Mendez, Carlos A.Monterio and Barry M.Popkin. Overweight exceeds underweight among women in most developing countries, *Am.J.Nutr.*, 2005,81,714-721 .
6. *Clinical Chemistry and Metabolic medicine*, Martin A Crook p -197-213, 2006.
7. Caballero B (2007). "The global epidemic of obesity: An overview". *Epidemiol Rev* 29: 1–5.