

Association of lipid levels and BMI in hyperlipidemic males (35-65 years) with and without type II diabetes

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ABSTRACT

This study was carried out on 35-65 years males. Purposive Sampling Technique was used for study. Subjects were divided into two groups according to their pathologic conditions. A booklet "eat healthy – live healthy" was also designed. BMI and low physical activity was positively associated with hyperlipidemia and NIDDM. Hypertension was found to be the common complication in both the groups.

Key words : Hypertension, Diabetes, Obesity, Hyperlipidemia

There is a close association between obesity and diabetes. People with diabetes have metabolic alteration like insulin resistance, blood lipid abnormalities, hyperlipidemia, hypertension and central obesity. Trunkal obesity is associated with high blood insulin levels which also increases the activity of lipoprotein lipase and fat storage and may indirectly cause over eating. Plasma cholesterol level is generally high in obese people. People with diabetes have metabolic alteration like insulin resistance, blood lipid abnormalities, hyperlipidemia, hypertension and central obesity. Increased adiposity is associated with several other risk factors, such as hypertension, sedentary lifestyle, glucose intolerance, low HDL-C concentrations and high triglyceride concentrations. Hyperlipidemia occurs in one-third to the half of diabetes patients. Hypertension is often associated with other risk factors such as obesity, blood lipid abnormalities, insulin resistance and glucose intolerance. The majority of middle-aged diabetics are obese. There is a strong association between diabetes and obesity but it is uncertain whether obesity is the result or the cause of diabetes. Despite the studies conducted on co-relation of obesity, hyperlipidemia and NIDDM over the past few decades, it is unclear whether adults with and without type II diabetes have similar lipid levels and BMI. So, the objectives of this study are- (a) to examine the predictive relation between hyperlipidemia, obesity and type II diabetes. (b) to educate the subject about the prevention and control of the three disorders through dietary modification.

METHODOLOGY

For the present study medical informations like BMI,

lipid levels, blood pressure, hemoglobin level etc. of the respondents were taken. The research design used for the study was the matched-control experimental design. The study was carried out on hyperlipidemic males with and without type II diabetes (NIDDM). The sample size was comprised of 50 males. Subjects were from 35-65 years of age and all socio-economic groups. Subjects were divided into two groups according to their pathologic conditions- (i) group I comprised of 25 hyperlipidemic men with type II diabetes. (ii) group II comprised of 25 hyperlipidemic men without type II diabetes. The study was conducted on respondents who fulfilled the above

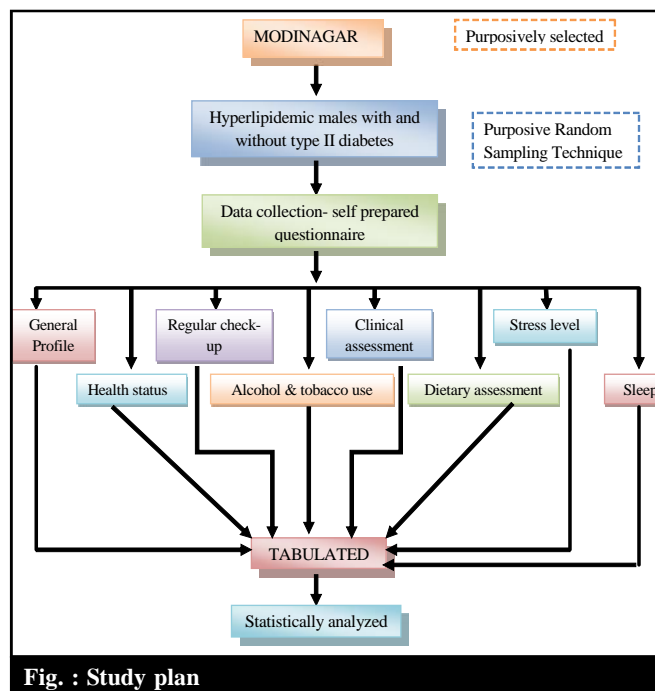


Fig. : Study plan

criteria from Modinagar, distt. Ghaziabad, U.P. for a period of six months that is from November, 2007 to April, 2008. The data for study were collected by using different tools and techniques : (I) *Questionnaire cum interview schedule*- general profile, health status, clinical assessment, dietary assessment, alcohol-tobacco consumption, sleep and stress level. (II) *Anthropometric measurements*- Anthropometric variables viz. height and weight to calculate BMI were used. Further, BMI was used to identify grade of obesity or overweight. (III) *Biochemical assessment* - Lipid profile and blood glucose levels were checked to compare the differences in both groups. Blood pressure and haemoglobin levels were also taken into consideration.

RESULTS AND DISCUSSION

Fig.1 reveals that in group I majority of respondents i.e. 52% were of grade I obesity (BMI 25-29.9) whereas 36% of respondents had BMI = 25 and 12% of respondents came under Grade II obesity (BMI 30-40). In group II, 44% respondents were also under Grade I obesity (BMI 25-29.9) whereas 40% of respondents had BMI = 25 and 16% of respondents came under Grade II obesity (BMI 30-40).

Fig. 2 shows that majority of respondents i.e. 56% and 64% of both Group I and Group II, respectively did not prefer to walk daily for 15-30 minutes. Whereas rest of respondents i.e. 44% of Group I and 36% of Group II preferred to walk daily for 15-30 minutes.

Fig. 3 conducts that majority of respondents in Group

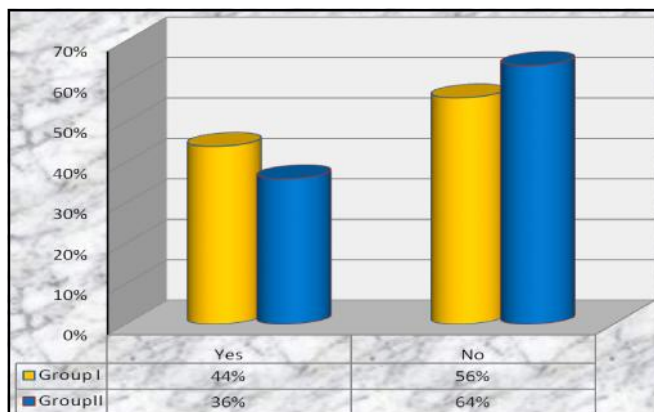


Fig. 2 : Walk for 15-30 minutes daily

I i.e. 56% were gaining weight from last 5-10 years and 28% were gaining weight from more than 10 years. Whereas, among Group II respondents, 36% each were gaining weight from last 5-10 years and 10 years. 12% and 8% of respondents, respectively of Group I and Group II were gaining weight from less than 5 years.

Table 1 shows that majority of respondents in both Group I and Group II i.e. 88% and 84%, respectively had blood pressure above the normal level (hypertension); whereas 8% and 16% had normal blood pressure. Only 4% of respondents in Group I and no one in Group II had blood pressure below the normal level (hypotension).

Fig. 4 reveals that majority of respondents in Group I i.e. 64% and 24% of Group II were at standard risk (<200mg/dl); whereas the respondents in both Group I and Group II i.e. 28% and 32%, respectively were at

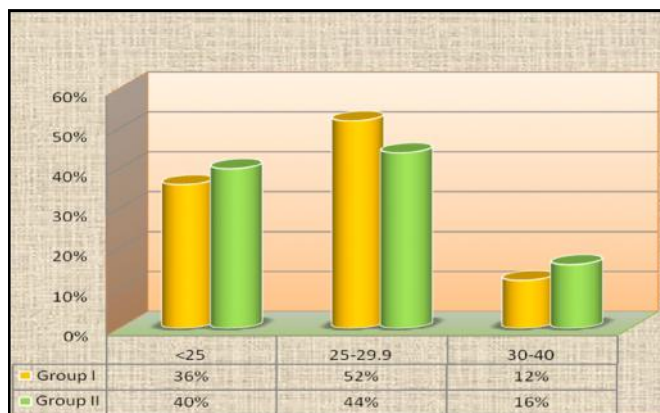


Fig. 1 : Body mass index of respondents

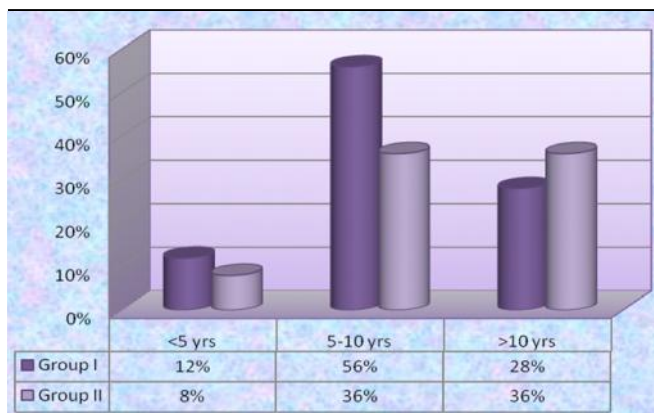


Fig. 3 : Period of gaining weight

Parameter	Category	Group I		Group II		² _{cal}	p<0.05
Blood pressure	mmHg	N	Percentage	N	Percentage	1.68*	#
	>80/120	22	88%	21	84%		
	80/120	2	8%	4	16%		
	<80/120	1	4%	0	0%		

suspected range (200-250mg/dl). But 8% of Group I and majority of respondents of Group II i.e.44% had serum total cholesterol level above the normal range (>250mg/dl; treatment needed).

Fig. 5 shows that majority of respondents in both Group I and Group II i.e. 80% and 68%, respectively were at standard risk (<150mg/dl) whereas 16% and 24% of respondents of Group I and Group II, respectively were at suspected range (150-180mg/dl). And 4% and 8% respondents of Group I and Group II, respectively had serum LDL cholesterol level above the normal range (>180mg/dl; treatment needed).

Fig. 6 conducts that majority of respondents in both Group I and Group II i.e. 52% and 48%, respectively were at standard risk (35-55mg/dl) whereas, 36% of respondents in both the groups were at favourable condition (>55mg/dl). But 12% and 16% respondents of Group I and Group II, respectively had serum HDL cholesterol below the normal range (<35mg/dl; treatment needed).

Fig. 7 reveals that majority of respondents in both Group I and Group II i.e. 76% and 60%, respectively had serum triglyceride level above the normal range (>200mg/dl; treatment needed) whereas, the respondents in Group

I and Group II i.e. 16% and 24%, respectively were at suspected range (150-200mg/dl). Only 8% and 16% of respondents in Group I and Group II, respectively were at standard risk (<150mg/dl).

Fig. 8 shows that majority of respondents in both Group I and Group II i.e. 68% and 64%, respectively did not consume restricted/modified diet; whereas, only 32% and 36% respondents, respectively consumed restricted/modified diet in their daily meal pattern.

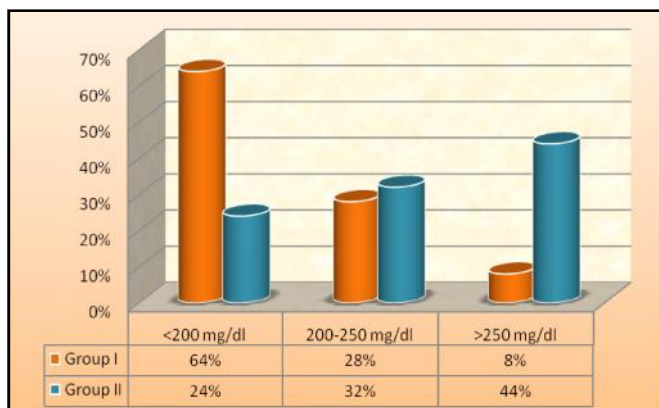


Fig. 4 : Serum total cholesterol

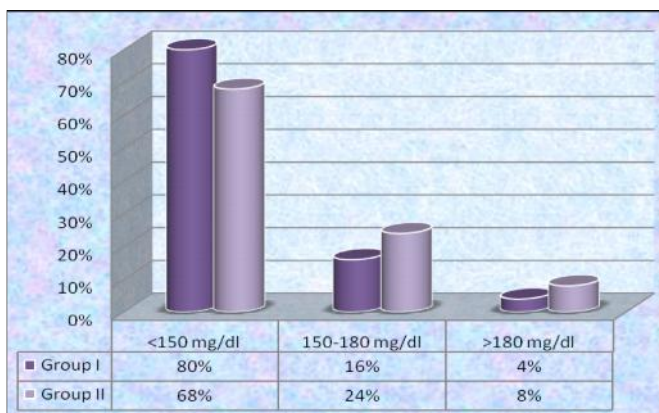


Fig. 5 : Serum LDL cholesterol

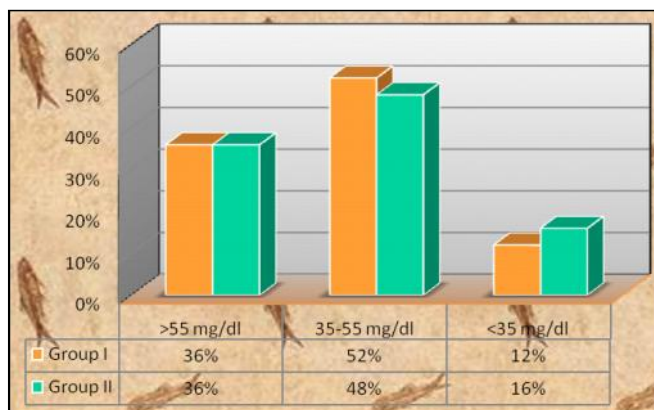


Fig. 6 : Serum HDL cholesterol

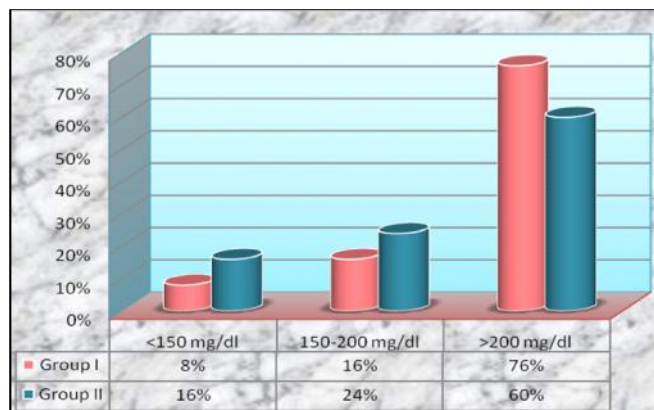


Fig. 7 : Serum triglycerides

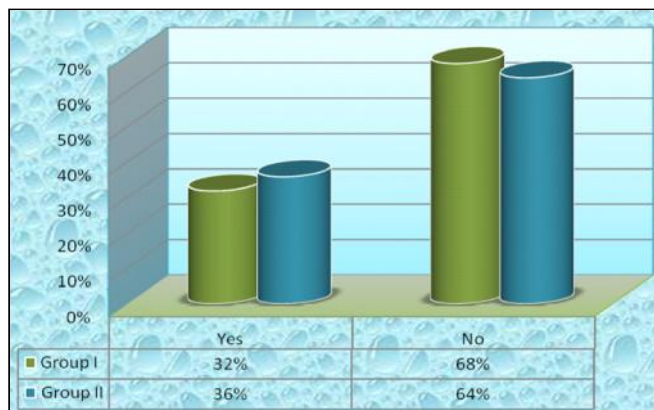


Fig. 8 : Consumption of restricted/modified diet in daily meal pattern

Summary and conclusion:

Study was divided into two groups. The Group I and Group II comprised of 25 hyperlipidemic males with and without type II diabetes, respectively. The general information of subjects regarding the age, type of family, medical information, health status, biochemical and dietary assessment were collected by questionnaire cum interview method. Percentage and chi-square test (χ^2) were used for the statistical analysis of the data. The results of the study undertaken are summarized as:-

- 52% of Group I respondents and 44% of Group II respondents came under Grade I obesity (BMI 25-29.9). Increasing BMI was found to be the cause of type II diabetes along with hyperlipidemia.

- 56% in Group I and 64% in Group II did not prefer to walk for at least 15-30 minutes daily *i.e.* they lead a sedentary lifestyle.

- Respondents with diabetes were more prone to suffer from chest discomfort than the non-diabetic respondents.

- Respondents with type II diabetes had more complications like arthritis than non-diabetic respondents.

- Majority of both group's respondents *i.e.* 88% in Group I and 80% in Group II were gradually increasing weight. This showed that the most influencing risk factor for both group's respondents was over-weight and obesity.

- More than 80% of both group's respondents were hypertensive. Hypertension has been found to be the common complication in respondents of both the groups.

- Most of the respondents in Group II *i.e.* 64% had serum total cholesterol level above the normal range.

- Serum LDL cholesterol level was found to be an independent risk factor for hyperlipidemia in males having NIDDM.

- Hypertriglyceridemia was found to be associated with type II diabetes. The clinical implication is that in NIDDM serum Tg should as low as possible to prevent atherogenic changes in LDL.

- More than 50% of respondents in both the groups had large quantities of fatty foods and sweets. 88% of both group's respondents preferred refined oil whereas, 52% of Group I respondents and 48% of Group II respondents generally used to prefer pure ghee but only 36% of Group I respondents and 28% of Group II respondents preferred mustard oil.

- 80% of Group I respondents and 44% of Group II respondents said that they are fond of sweets. It has been found that quantity and type of food influences the pathological conditions of the respondents.

- 68% of Group I respondents and 64% of Group

II respondents denied to have restricted/modified diet in their daily meal pattern.

- Majority of both group's respondents *i.e.* 88% in Group I and 80% in Group II generally felt tense or anxious.

Thus, hypertriglyceridemia and obesity were found to be associated with type II diabetes along with hyperlipidemia. It can be said that obesity and hypertriglyceridemia were found to be the positive independent risk factor in hyperlipidemic males with type II diabetes.

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