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Research Article

A STUDY OF SOME ANTHROPOMETRIC VARIABLES AND LIPID PROFILE IN DIABETIC AND NON-DIABETICS IN RURAL KOLAR

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ABSTRACT
This cross sectional study includes 500 diabetic and 500 apparently healthy subjects. The aim of the study was to compare anthropometric variables and lipid profile in diabetic and non-diabetics. Anthropometric variables included were height, weight, body mass index (BMI), waist hip ratio (WHR) and lipid parameters were serum total cholesterol (TC), triglycerides (TG), Low density lipoproteins-C (LDL-C) and High density lipoproteins-C (HDL-C). Results indicate that height, weight and waist hip ratio were significantly high in diabetics compared to non diabetics. Significantly high TG (p=0.093) and low HDL (p=0.006) were noted in diabetics. Among non diabetics total cholesterol and LDL were significantly high.

Key Words: *Anthropometric Variables, Lipid Profile, Diabetic, Non Diabetic*

INTRODUCTION
Indian population has a very high incidence of ischemic heart disease with lipid profile as one of the risk factors which is different from those seen in western populations. Elevated levels of triglyceride, total cholesterol, LDL-C and low HDL are documented as risk factors for atherosclerosis. Different plasma lipids vary significantly in various population groups due to differences in geographical, cultural, economical and social conditions.

Intra abdominal fat, however, is probably more important than overall weight as a cardiovascular risk factor (Rimm *et al.,* 1995). As described by Vague (1956), an android fat distribution (abdominal obesity, or apple shaped body) is related to an increased risk of cardiovascular disease. Intra abdominal fat increases insulin resistance and the related cluster of metabolic risk factors (glucose intolerance or diabetes mellitus, low HDL-cholesterol concentrations, elevated triglyceride concentrations, hypertension and obesity (Reaven, 1988; Pascot *et al.,* 2000; Arora *et al.,* 2007).

Due to the high degree of genetic predisposition and high susceptibility to environmental conditions characterized by a low BMI, high upper body adiposity, a high body fat percentage and a high level of insulin resistance, Indian population faces higher risk for diabetes and its complications (Rosenson, 2005)**.** The waist to hip ratio is commonly used as an indirect measure of lower and upper body fat distribution. Young adults with waist to hip ratio in excess of 0.94 for men and 0.82 for women are at high risk for adverse health consequences (Bray and Gray, 1988). Janssen *et al.,* (2002) opined that body mass index and waist circumference independently contributed to the prediction of abdominal, subcutaneous and visceral fat. Association of lipid profiles is reported with lifestyle (Twisk *et al.,* 1998) age (Maki, 1997), intra-abdominal adiposity (Mannabe *et al.,* 1999)**,** Obesity (Pihl and Jurimae, 2001), BMI (Bertolli *et al.,* 2003**)** and Waist to hip ratios (Lopatynski *et al.,* 2003)

In the present study, an attempt has been made to study some anthropometric variables and lipid profile in diabetic and non-diabetics.

MATERIALS AND METHODS
A cross sectional study was conducted in R L Jalappa hospital attached to Sri DevarajUrs Medical College, Kolar. Randomly selected 500 type 2 diabetes and 500 non-diabetes patients attending medicine outpatient department of RL Jalappa hospital, Kolar from September 2012 to February 2013 were

included in the study. The study was approved by institutional ethical committee and a written informed consent was obtained from all the participants. All the patients were interviewed with pre-designed and pre-tested Proforma. Patients suffering from other causes of secondary dyslipidemia were excluded. Self reported pregnancy, any chronic infectious disease and weight loss >6 kgs during past 6 months were also excluded from the study. Fasting blood samples were analysed for total cholesterol(TC) by enzymatic cholesterol oxidase/peroxidase method, triglycerides (TG) by enzymatic glycerol kinase/ peroxidase method, high density lipoprotein cholesterol (HDL-C) by precipitation method, low density lipoprotein cholesterol (LDL-C) was be calculated by Friedewald's formula LDL-C=(TC−TG/5+HDL).

All the participants had their anthropometric data measured only in the morning time. Measurement of weight to the nearest of 0.1 kg by a weighing machine and height to the nearest of 0.1 cm by measuring tape were recorded. BMI was calculated as weight (in Kg) divided by height (m^2) as indicated by World Health Organization (WHO, 1998). Waist and hip circumference were measured twice by using measuring tape and average of two readings was taken. Waist was taken at the level of the natural waist (the narrowest part of the torso). The hip circumference was measured at the maximum circumference of the buttocks posteriorly and the symphysis pubis anteriorly, in a horizontal plane and waist to hip ratio was calculated (Callaway *et al.*, 1998).

RESULTS

Independent t- test was used for statistical analysis. p value <0.05 was considered as significant. The descriptive analysis of the data was done using, Statistical software EPI-INFO. Present study includes 500 type 2 diabetes and 500 non-diabetes patients. The mean value of anthropometric variables and lipid parameters were shown in table1.

Table1: Distribution of mean values and standard deviation of anthropometric variables and lipid parameters in diabetic and non-diabetic subjects.

Parameters	Diabetics (n=500)			Non Diabetics (n=500)			t value	P value
	Mean	S.D	S.E	Mean	S.D	S.E		
Height (cm)	162.95	8.83	0.39	161.30	9.62	0.43	2.82	0.005*
Weight (kg)	65.90	11.27	0.50	63.86	13.01	0.58	2.65	0.008*
BMI (kg/m^2)	24.76	4.23	0.18	24.62	4.62	0.20	0.47	0.635
WHR	`1.01	0.12	0.05	0.95	0.19	0.05	6.45	0.000*
TC (mg/dl)	168.88	39.35	1.75	178.45	40.18	1.79	-3.80	0.000*
TG(mg/dl)	176.63	92.80	4.15	167.43	79.91	3.57	1.67	0.093
HDL(mg/dl)	37.62	5.95	0.26	42.05	35.71	1.59	-2.74	0.006*
LDL(mg/dl)	95.27	37.12	1.66	107.45	61.40	2.74	-3.79	0.000*
VLDL(mg/dl)	36.53	30.79	1.37	33.73	17.10	0.76	1.79	0.073

**p<0.05*

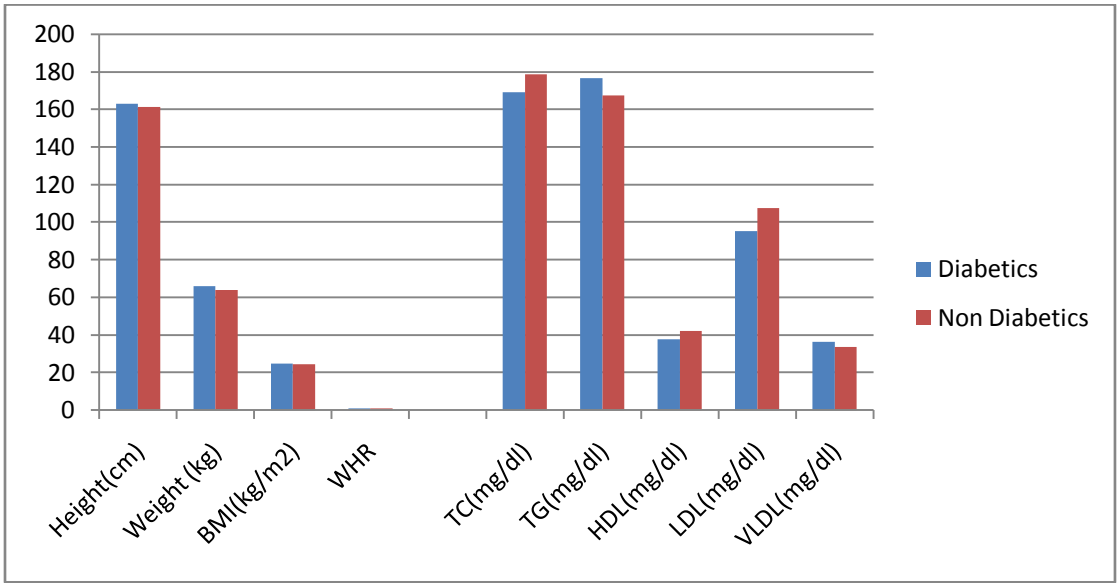

Figure1: Shows the mean values of anthropometric variables and lipid parameters in diabetic and non-diabetic subjects.

It was observed that among diabetics the height (162.95 cm), weight (65.90 kg), and WHR (1.01) were significantly high compared to non diabetics ($p<0.05$). Whereas no significant difference was noted in relation BMI ($p=0.635$) among diabetics and non diabetics. Significantly high TG ($p=0.093$) and low HDL ($p=0.006$) were noted in diabetics compared to non diabetics. Among non diabetics total cholesterol and LDL were significantly high ($p<0.05$).

DISCUSSION

Weight was such factor that affects greatly towards metabolic risk. In fact, it was reported earlier too, that weight loss and or gain was related to increased risk for abdominal fat distribution and therefore metabolic risk profile (Pihl and Jurimae, 2001).Hence higher values of anthropometric measurements which are important risk factors for diabetes which is already well documented in many studies (Rimm *et al.*, 2005; Montague and O'Rahilly, 2000; Vague, 1956) and similar observations was found in our study.
Significantly high TG and low HDL were noted in diabetics compared to non diabetics in the present study. This is well documented component of diabetic dyslipidemia. In the present study increased in LDL-c and TC were noted in non diabetics compared to diabetics. Increased in LDL-c and TC makes the individual more prone to metabolic risk profile **(**Martinez *et al.*, 2002) In the present study WHR is significantly high in diabetics compared to non diabetics .WHR is considered as an important anthropometric measurement to assess the metabolic risk (Okosun *et al.*, 2000; Lopatynski *et al.*, 2003).

Conclusion

In conclusion the present study indicates that anthropometric variables like height, weight and waist hip ratio were significantly high in diabetics compared to non diabetics. Significantly high TG ($p=0.093$) and low HDL ($p=0.006$) were noted in diabetics as part of diabetic dyslipidemia.So in management of diabetes along with blood sugar control, control of obesity and dyslipidemia has to be included.

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