



FASTING BLOOD SUGAR LEVELS DYSLIPIDEMIA AND GLYCATED HAEMOGLOBIN IN CARDIAC AND DIABETIC PATIENT AS COMPARED TO CONTROLS.

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ABSTRACT

One hundred healthy controls, cardiac and diabetes patients –each one 100 were subjected to a study of fasting blood sugar .total cholesterol, triglycerides, HDL-c, LDL-c ,VLDL-c and HbA1c. Fasting blood sugar and lipid profile was higher in cardiac and diabetic patients. Cardio vascular risk is elevated by type 2 diabetes mellitus by increase glycemic control and dyslipidemia. HbA1c is not associated with FBS, glycemic control, dyslipidemia or duration of diabetes mellitus .It is worth investigating the dependent of HbA1c on RBC hemolysis.

KEYWORDS : Cardiac patients, Diabetes patients, Lipid profile, Glycated Hb.

INTRODUCTION

Vit D is metabolised by hepatic and renal hydroxylase to 1,25(OH) vit D which exerts its function by binding to its receptor .Most of the nutritional requirement is met from cutaneous solar ultraviolet sunrays and to a lesser extent from foods naturally occurring or fortified . Its levels can be measured as 1,25[OH] Vit D .

Vitamin D has been linked to several health outcomes including neuromuscular rickets, bone fractures, osteopenia, osteoporosis and muscular weakness and non-skeletal complications like cardiovascular diseases and risk factors such as congestive heart failure , impaired systolic and diastolic blood pressures, myocardial infarction, peripheral vascular disease, abdominal aortic aneurysm in older men . It was also associated with tuberculosis, rheumatoid arthritis, multiple sclerosis, inflammatory bowel diseases, cancers, non-alcoholic fatty liver disease, cystic fibrosis, burn injuries, DM, insulin resistance and metabolic syndrome⁽¹⁾.

MATERIALS AND METHODS.

One hundred healthy controls and 100 cardiac patients' attended IP/OP of SK Hospital were included in the study. Blood was collected using disposable syringes and needles .Serum separated by centrifugation at 3500 rpm for 10 minutes using Kemi centrifuge.

Total cholesterol ,Triglycerides ,LDL-c and VLDL -c were measured using flex in Siemens Automated Chemistry Analyser supplied by Remedex.HDL-c measured using direct method .Vit D measured as 1,25(OH) vitD using Chemiluminescent Microparticle Immuno Assay (CMIA) using i1000SR instrument of Abbott USA.

RESULT

Total cholesterol, Triglycerides, HDL-c, LDL-c and VLDL -c expressed as mg/dl. Vit D expressed as $\mu\text{g/ml}$. Vit D levels were low in all cardiac patients compared to controls .Dyslipidemia noticed in cardiac patients. The lipid profile studied in 100 diabetic patients. The levels were much higher compared to controls and cardiac patients. Both in controls and patients HbA1C was also measured using D_{10} by ion-exchange HPLC technology. Haemoglobin levels measured in all samples and expressed as g%.

DISCUSSION

There is high prevalence globally of low Vit D levels .It is associated with adverse health related problems. Current evidence suggests with a higher risk of cardiovascular

diseases and risk factors with lower Vit D levels. Therefore, larger randomized clinical trials are warranted to explore the benefits of vitamin D supplementation, which would at least reduce the impact of such high health problems. Diabetes Mellitus is the most common metabolic disorder affecting the world population irrespective of the geographical regions of the world. According to the International Diabetes Federation (IDF) it is estimated that about 438 million people or 7.8% of the adult population in the world are predicted to have diabetes by 2030⁽²⁾. Fourth edition of the world diabetes atlas published by IDF at Canada predicts that India will be the diabetic capital of world and by 2030; 9% of the country's population is likely to be affected by diabetes mellitus.

More than 90% of diabetes deaths occur in low and middle income countries⁽³⁾. Unfortunately, there is still inadequate awareness about the real effect of this problem in the community. Inadequacies in the primary health care system result in suboptimal treatment and follow up of this chronic disease, often leading to complications and early death.

Results from various metabolic and epidemiologic studies^(4,5,6,7) provide very strong evidence that obesity and BMI is directly related to type 2 diabetes mellitus. Meta analysis of studies showed relative high risk for 204 patients with increase body waist circumference >10% .However there is very little glycemic control especially in Indian community.

Low VitD contribute to high cardiovascular risk .Cardiac patients have dyslipidemia that enhance the cardiac risk .Thus low Vit D and high lipids are factors that elevate cardiac risk specially in old people. Diabetic patients too have dyslipidemia which increases atherosclerosis of cardiac patients compared to non diabetes cardiac patients.

The complications of diabetic cases are directly coordinated with mean and higher HbA1c levels. Acute myocardial infarctions also correlate with elevated mortality in diabetes which widely effects on auto neuropathy due to toxic release of catecholamine, corticosteroid and free fatty acids.

HbA1c, glycoprotein enhances DM and its measurement is significant to differentiate normal and diabetes mellitus and its measurement is significant to differentiate normal and diabetes mellitus. High HbA1c is more prevalence in males than in females. There is high mortality due to macro muscular complications that contribute worsening of kidney function. HbA1c is influenced by RBC turnover.

Since HbA1c is dependent on glycemic control but is independent of duration of diabetes and FBS level.

[8] Clark RS, English M, McNeill GP & Newton RW. Effect of intravenous infusion of insulin in diabetics with acute myocardial infarction. *Br Med J (Clin Res Ed)*, 1985; 3: 291(6491): 303-5.

There is a need for target clinical studies to answer the questions are that traditionally held higher glucose with control in type 2 DM requires glycemic control in T2DM glucose value to more research in the field.

Table - I Lipid Profile In Controls, cardiac Patients And Diabetic Patients.

Sl.No	Group	N	FBS	T.cho	TG	HDL-c
1.	Control	100	82	158	49	89
2.	Cardiac patients	100	125	162	41	92
3.	Diabetic Patients	100	158	182	46	96

Blood was drawn using disposable syringe and needle. Serum separated by centrifugation at 3500 rpm for 10 mins. FBS, Lipid Profile measured using flexes in Dimension Xpand plus of Siemens Fully Automated Chemistry analyzer. Result Expressed as mg/dl.

Table - II HbA1c %

FBS	A1c %	FBS	A1c %	FBS	A1c %	FBS	A1c %	FBS	A1c %	FBS	A1c %
175	12.1	276	10.2	200	11.7	213	9.3	338	9.1	471	10.7
161	9	203	7.6	200	11.4	262	12.4	340	15.6	469	12.1
160	11.8	221	11	246	10.7	277	12.7	314	9.9	414	9.2
132	12	232	11.5	225	10.8	215	12.1	390	12	445	11.5
194	10.7	257	10	262	11	259	11	355	9.5	439	16.2
199	13.8	274	11.8	235	10.4	256	10.1	310	12	457	13.7
173	10.6	275	12.5	293	12.2	280	11.8	335	9	457	12.1
172	9.3	269	10.4	208	9	314	13.3	360	11.4	448	12.7
151	10.5	219	9.3	233	9.7	319	11.2	379	9.9	432	10.1
164	10	296	11.6	259	9.3	313	11.4	307	10.7	422	10.1
159	9.1	289	10.9	252	10.8	336	11.4	377	14.3	419	10.6
176	11.2	281	10.4	296	10.2	340	10.4	334	11.2	465	15.5
177	10.8	211	12.5	269	9.9	301	15.2	307	15.5	477	15
193	10.4	293	11.6	264	9.9	325	10.7	305	12.6	512	11.6
183	11.1	252	11.9	218	9.7	378	13.3	323	13.5	554	13.4
107	9.3	277	10.5	280	12.7	369	11.8	369	11.4	560	10.7
195	10.7	278	10.4	237	11.7	373	11.3	374	12.2	541	12.5
213	12.8	202	14	259	11.1	303	11.6	393	11.4	571	11.2
227	10.1	298	11.7	210	11.5	337	10.1	304	14.7	571	10.7
										510	10.8
										577	9.7

CONCLUSIONS

Controls, Cardiac and diabetes mellitus patients one hundred each were analysed for fasting blood sugar, lipid profile and glycated Hb levels. Sugar levels and lipid profile was higher in cardiac patients compared to healthy controls. Glycated haemoglobin has been shown to depend on glycemic control but independent of duration of DM. In the present study it is found that HbA1c level is independent of fasting blood sugar .Probably it may be related to RBC haemolysis turn over.

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