

A PROSPECTIVE STUDY OF LONG TERM EFFECT OF STATINS ON DYSLIPIDAEMIA, INTIMA-MEDIA THICKNESS AND C-REACTIVE PROTEIN IN TYPE-2 DIABETES MELLITUS

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ABSTRACT: Dyslipidaemia is one of the major risk factor for cardio vascular disease in diabetes mellitus. Lipid abnormalities in type 2 diabetes mellitus are characterised by high triglyceride concentration low HDL concentration and normal total and low density lipo-protein cholesterol (LDL-c) concentration. Present study is a prospective study to evaluate the effect of statin on Dyslipidemia and the markers of atherosclerosis in type-2 diabetes mellitus. Metformin and Rosuvastatin have good effect on lipid profile and hs-CRP. But the response on the decrease in thickness of common carotid intima-media, result was statistically significant but not as per the expectation.

KEYWORDS: Dyslipidemia, Intima Media Thickness, Statins.

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INTRODUCTION: Dyslipidaemia is one of the major risk factor for cardio vascular disease in diabetes mellitus.⁽¹⁾ Lipid abnormalities in type 2 diabetes mellitus are characterised by high triglyceride concentration low HDL concentration and normal total and low density lipo-protein cholesterol (LDL-c) concentration.⁽²⁾ LDL particle are small and dense so they more atherogenic and are easily glycosylated and susceptible to oxidation.⁽³⁾ Atherosclerosis proceeds at a more rapid rate and is more extensive in diabetic then non diabetic, and is the major cause of death.⁽⁴⁾ According to the guidelines of the ADA, the target lipid Values in diabetic individual having age>40 years should be as follows LDL<100mg/dl, HDL for male>40mg/dl female>50mg/dl and tri glyceride<150mg/dl.⁽⁴⁾ So in addition to strict glycaemic control by various drugs statins are used to slower the progress the atherosclerosis and reducing the coronary artery disease in type-2 Dm. Regarding surrogate markers of atherosclerosis in type 2 diabetes statins improve endothelial dysfunction, reduce markers of endothelial activation and inflammation, progression of intima-media thickness and augmentation index.^(5,6)

MATERIAL AND METHODS: Present study is a prospective study to evaluate the effect of statin on Dyslipidemia and the markers of atherosclerosis in type-2 diabetes mellitus. Twenty patients between the age 45 to 60 yrs of age and having type-2 diabetes mellitus with Dyslipidemia, have been enrolled for study as per exclusion and inclusion criteria. Before start of study permission from institutional ethical committee was obtained and written consent was obtained from each patient on prescribed consent from which was in two languages. Study has been

performed between august 2014 to oct 2015 in the GEMS medical college srikakulam, dept. of General medicine.

Inclusion Criteria:

- Age 40-60yrs.
- Sex-both.
- Dyslipidemia.
- Intima media thickness>1mm.

Exclusion Criteria:

- Diabetic complication Like, acidosis, coma.
- H/o hypersensitivity to drugs. CVA, IHD.
- Liver damage/renal competition.

Before the start of study the parameters like TG, LDL, HDL, chol, c-reactive protein and intima-media thickness of common carotid artery was calculated. FBS and PPBS were estimated every 15 days. Patient was advised to take low fat and low caloric diet with more fibre. Diet chart as per

the local food pattern was prescribed and was supervised by their relatives regularly. Patients were also advised to have walk for 45 min five days in a week. The patients were prescribed 500mg metformin and resuvastatin 10mg once daily. Patient was advised to take metformin at breakfast and resuvastatin at 8 o'clock in the evening. All the parameters were repeated at three months interval final estimation was taken after 48 weeks.

LDL-c was estimated by W.T Friedowald, R. I. lery and D. C Friedrickson method, serum triglyceride estimated by method of Neri and Fringe 1973 modified debnath 1978. HDL estimated by precipitation method and serum cholesterol by ZAK modified method of 1957. Intima-media thickness was estimated by Philips clear vue USG machine and c-reactive protein by CRP ELISA Kit.

RESULTS: The effect of drugs were calculated by using students paired t-test. There was significant change in the LDL-c after 48 weeks of treatment mean change in LDL concentration was 28.57% having t value 11.33 and p

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value was less than 0.001. Total Triglyceride concentration also decreased significantly after 48 weeks of therapy. Mean change in the concentration was 14.58% having t value 3.78. HDL concentration was increased. Mean increase in HDL concentration was 21% and t value was 5.2 and p value was less than 0.01. Serum cholesterol cogeneration was decreased by 13% with t-value 8.21 and p value less than 0.001.

		Mean	t-Value	P-Value
LDL	BT	140.4	11.33	<0.001
	AT	100.4		
HDL	BT	38.6	5.2	<0.001
	AT	46		
Chol	BT	194.2	8.21	<0.001
	AT	169.2		
TG	BT	192.8	3.78	<0.001
	AT	164.8		

Table 1: Effect of drugs on lipid profile

Mean hs-CRP was changed significantly by 16.5% after 48 week of treatment with p value <0.01 and t value 10.310.

	Mean	t-value	p- value
BT	3.59	10.310	< 0.001.
AT	1.94		

Table 2: Effect of drugs (HS-CRP)

df-19

Intima-media thickness was also changed after 48 weeks of treatment. Mean change, 4% having t value 2.29 and p value<0.05.

Table-3: Effect of drugs

	Mean	t- value	p- value
BT	1.221	2.29	< 0.05
AT	1.168		

Table 3: Effect of drugs on intima-media thickness

DISCUSSION:

Effect on Lipid Profile: There was significant decrease in the concentration of LDL-C after 48 weeks of treatment with metformin and Rosuvastatin in type-2 DM patient from 140.4 mg/dl to 100.4 mg/dl percentage. Change in the mean was 28.57%. This effect corroborates with many literature.^(7,8)

The study has found that there is significant increase in the concentration of HDL from 38.mg/dl to 46 mg/dl, percentage change in the concentration was 21.05% which is as per study of Kawashiri et al.⁽⁹⁾

Regarding Triglyceride and serum cholesterol concentration of both have been reduced significantly after 48 weeks of treatment mean change was 192.8mg/dl to 164.8 mg/dl and 194.2mg/dl to 169.2 mg/dl respectively,

and was statistically significant also. This was supported by various literatures.⁽¹⁰⁾

Effect on hs-CRP: long term therapy with Rosuvastatin was associated with significant reduction in hs-CRP after 48 weeks of therapy. This is also supported by various investigators.⁽⁷⁾

EFFECT ON INTIMA MEDIA THICKNESS: With the long treatment of type – 2 diabetes mellitus patient with diet restriction regular activity, Rosuvastatin and metformin it was found that there was reduction the thickness of carotid intima-media and also that was statistically significant but the rate of decrease in the thickness was slow and was not as per with the expectation which is matching with the study of Crouse JR 3rd et al.^(11,12)

CONCLUSION: we conclude that metformin and Rosuvastatin have good effect on lipid profile and hs-CRP. But the response on the decrease in thickness of common carotid intima-media, result was statistically significant but not as per the expectation. We recommend further study with more number of patients with type-2 DM.

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