



A Study on Lipid Profile in Non-Diabetic Myocardial Infarction Patients attending a Tertiary Care Hospital of Raipur City (C.G.), India

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ABSTRACT

Introduction:- In more than 90% of cases, the cause of myocardial ischemia is reduced blood flow due to obstructive atherosclerotic plaque lesions in one of the three large coronary arteries or its branches. Coronary atherosclerosis is a complex inflammatory process characterized by accumulation of lipids, macrophages and smooth muscle cells resulting in the formation of intima plaques in the large and medium size epicardial coronary arteries. Atherosclerosis changes due to dyslipidemia were more common in diabetic patients than non diabetics as per available previous researches. Through in this study, we analyses that abnormality in lipid profile is associated with increased risk of myocardial infarction in non-diabetic patients.

Material and Method:- A prospective study was conducted in Dr.B.R.H.M. Hospital, Pt.J.N.M.Medical College, Raipur (C.G.) India, during study period Nov.2013 to Oct.2014. A total of 100 patients of MI were enrolled for the study. Patients with suspected emboli of cardiac origin and diabetic (type 1 & 2) were excluded from the study. Data was compiled in Ms-excel and checked for its completeness and correctness. Then it was analyzed.

Result:- Male and Female ratio was found approximately 4:1 among case group. Approximately 31% of the patients were found to have triglyceride level more than 240. Approximately 17% of the subjects were found to have higher LDL level.

Conclusion:- In the current study, there was a significant association found between serum total cholesterol, triglyceride and LDL Level with risk of myocardial infarction.

KEYWORDS

Non diabetic patients, Myocardial infarction, Lipid profile, Raipur

Introduction:-

Myocardial infarction (MI) is the important manifestation of coronary heart disease. MI is myocardial necrosis occurring as a result of critical imbalance between coronary blood supply and myocardial demand. Myocardial infarction is the "impairment of heart function due to inadequate blood flow to the heart compared to its need, caused by obstructive changes in the coronary circulation to the heart". In more than 90% of cases, the cause of myocardial ischemia is reduced blood flow due to obstructive atherosclerotic plaque lesions in one of the three large coronary arteries or its branches. Coronary atherosclerosis is a complex inflammatory process characterized by accumulation of lipids, macrophages and smooth muscle cells resulting in the formation of intima plaques in the large and medium size epicardial coronary arteries. The etiopathogenesis leading to atherogenesis is still unknown. But a number of risk factors have been identified. Modifiable risk factors are serum lipids, lipoproteins, Hypertension (HTN), Diabetes Mellitus (DM), smoking and tobacco chewing etc. Non modifiable risk factors are age, sex, genetics, and family history of Dyslipidemia is one of the major risk factors for cardiovascular disease in, diabetes mellitus. The characteristic features of diabetic dyslipidemia are a high plasma triglyceride concentration, low HDL cholesterol concentration and increased concentration of small dense LDL-cholesterol particles. The lipid changes associated with diabetes mellitus are attributed to increased free fatty acid flux secondary to insulin resistance. The increased risk of atherosclerosis in diabetes mellitus consists of multiple factors. Diabetes-related changes in plasma lipid levels are among the key factors that are amenable to interven-

tion one phenotype is particularly common in diabetes mellitus, which is attributed mostly to insulin resistance and insulin deficiency. [1, 2, 3, 4, 5]

Atherosclerosis changes due to dyslipidemia were more common in diabetic patients than non diabetics as per available previous researches. Through in this study, we analyses that abnormality in lipid profile is associated with increased risk of myocardial infarction in non-diabetic patients. With this background, the present study was conducted to assess the risk of myocardial infarction in non diabetic patients attending a Tertiary care hospital of Raipur city (C.G.), India.

Material and Method:-

A prospective study was conducted in Dr.B.R.H.M. Hospital, Pt.J.N.M.Medical College, Raipur (C.G.) India, during study period Nov.2013 to Oct.2014. A total of 100 patients of MI were enrolled for the study. 80 patients of myocardial infarction and remaining 20 were controls. All subjects were adult of age more than 30 years. Patients with suspected emboli of cardiac origin and diabetic (type 1 & 2) were excluded from the study.

Selected patients will be subjected to following protocol-

1. Detailed history
2. Detailed CVS examination
3. Blood sampling after 12 hrs.Fasting for [Serum total cholesterol, Serum triglycerides, Serum HDL, Serum VLDL, Serum LDL]
4. Blood sugar (FBS/PPBS)

- 5. Echocardiography
- 6. ECG
- 7. HbA1c

Data was compiled in Ms-excel and checked for its completeness and correctness. Then it was analyzed. Suitable statistical test were applied and p-value < 0.05 was considered as a statistical significant.

Result:-

Table-1. Age and sex wise distribution of subjects

Age group in years	Male	Female	Total
30-35	5	0	5
35-40	5	1	6
40-45	7	2	9
45-50	13	2	15
50-55	11	0	11
55-60	7	3	10
60-65	8	1	9
65-70	5	3	8
70-75	2	2	4
>75	3	0	3
Total	66(82.5%)	14(17.5%)	80

Table-2. Distribution of Myocardial Infarction Patients According To Total Cholesterol (ATP – III guidelines)

SN	Range	Myocardial Infarction		
		Male	Female	Total
1	<200	31(48.9%)	8(57.2%)	40(50%)
2	200-240	12(18.18%)	3 (21.4%)	15(18.75%)
3	>240	22(33.33%)	3(21.4%)	25(31.25)
Total		66(100%)	14(100%)	80(100%)

Sex	Control			Case			t- test	p-value
	Mean	SD	SE	Mean	SD	SE		
Male	141	13	3.6	198	49	5.7	3.5	<0.001
Female	147	17	6	182	42	10.0	2.0	>0.05

Table-3. Distribution of Myocardial Infarction Patients According To Triglyceride

S. N.	Range	Myocardial Infarction		
		Male	Female	Total
1	<150	28(42.42%)	7(50%)	35(43.75%)
2	150-199	22(33.35%)	6(42.86%)	28(35%)
3	200-499	16(24.25%)	1(7.14%)	17(21.25%)
Total		66(100%)	14(100%)	80(100%)

Sex	Control			Case			t- test	p- value
	Mean	SD	SE	Mean	SD	SE		
Male	98	20	5.6	51	6.2	3.9	.000	<0.001
Female	79	25	9	141	47	12	3.1	<0.01

Table-4. Distribution of Myocardial Infarction Patients According To LDL (ATP – III guidelines)

S.N.	Range	Myocardial Infarction		
		Male	Female	Total
1	<100	31(46.96%)	2(14.28%)	33(41.25%)
2	100-130	9(13.64%)	5(35.71%)	14(17.5%)
3	130-160	9(13.64%)	5(35.71%)	14(17.5%)
	>160	17(25.76%)	2(14.28%)	14(17.5%)
Total		66(100%)	14(100%)	80(100%)

Sex	Control			Case			t- test	p-value
	Mean	SD	SE	Mean	SD	SE		
Male	80	22	6	115	47	5.7	2.4	<0.05
Female	109	27	10	128	28	7.6	1.4	>0.05

Table-5. Distribution of Myocardial Infarction Patients According To HDL

S.N.	Range	Myocardial Infarction		
		Male	Female	Total
1	<40	57(86.36%)	13(92.85%)	70(87.5%)
2	>40	9(13.64%)	1(7.15)	10(12.5%)
Total		66(100%)	14(100%)	80(100%)

**p-value >0.05 , [Male, case & control]
p-value >0.05 , [Female, case & control]**

In the present study, total no. of study subjects was 100. (80- non diabetic MI cases and 20 healthy controls) Male and Female ratio was found approximately 4:1 among case group. In our study 82% subjects were males. Approximately 31% of the patients were found to have triglyceride level more than 240. In this study, 21% of the patients had higher TG level, whereas 35% of the subjects were found to have their TG level (150-190). Nearly 54.5% of the subjects were found between age group (40-60 year). Approximately 17% of the subjects were found to have higher LDL level. Nearly 12.5% subjects had their HDL level more than 40. Lipid profile level was found significantly associated among case and control group.

Discussion:-

Epidemiological studies suggest that patients with elevated lipid levels are at higher risk for atherothrombotic myocardial infarction than those with normal values and this applies mainly to premature ischemic cardiovascular disease.

Although serum lipids have been incriminated in the pathogenesis of atherosclerosis, very little is known concerning the possible inter-relationship between abnormal levels of serum lipids and development of vascular complications. Belief in the possibility of such interrelationship arouse in part from the observation that lipid composition of the intima of the arteries resembles that of serum. Hence Dyslipidemia has emerged clearly as a major risk factor associated with increased risk of atherosclerosis.

Nigam PK [6] found increasing trend of TG levels with significant increase in day 3 compared to day 1 in cases compared to controls in Indian population. The mechanism of increase in TG after MI may be due to elevated flux of fatty acids and impaired removal of LDL from the plasma. Another mechanism may be the effect of blockers.

In our present study, there was significant increase in LDL levels compared to controls. Our results were in accordance with Sabari Das, Christa and Paul Holvo et al. [7, 8, 9] Since TG brings significant change in LDL particle size, density, distribution and composition producing small dense LDL which is more atherogenic. They suggested oxidation of LDL plays important role in atherogenesis.

Christa and Paul Holvoet in a prospective, nested, case control population future CHD events in apparently healthy men. Thus they showed, ox-LDL may represent a promising risk marker for clinical CHD complications and should be evaluated in further studies. [8, 9]

Another study found significant increase in LDL levels in CAD patients. They proposed that, since most of the cholesterol is carried by LDL, increase in LDL level may directly leads to increase in total cholesterol levels. In contrast to our study, **Nigam** found no significant correlation between LDL and risk of CHD. [6]

In our study, we found significant decrease in HDL levels compared to controls. Results were in accordance with **Framingham Study, Palanisamy and Suman Sharma. Palanisamy**

and Suman Sharma found significant decrease in HDL levels along with increase in TC, TG and LDL in patients with acute MI. They concluded dyslipidemia along with imbalance between oxidant and antioxidant molecules plays a very important role in CHD. [10, 11, 12]

Conclusion:-

In the current study, there was a significant association found between serum total cholesterol, triglyceride and LDL Level with risk of myocardial infarction. Present study suggests that plasma lipids and lipoproteins, in patients with MI will contribute significantly to the risk assessment, prophylaxis and management of Myocardial Infarction. MI patient with dyslipidemia need a comprehensive health care approach involving dietician, physician and good bio chemistry back up. In Indian scenario, where majority of the patients belong to the low socio economic status, life style modification plays a more important role in prevention and management of MI and dyslipidemia in contrast to high cost of lipid lowering agents. The finding of the present study will be also useful for physicians in priority setting and decision making during the management of these patients for effective outcome.

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