

A prospective observational study of patients admitted with newly diagnosed unstable angina pectoris with special emphasis to underlying risk factors

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Abstract

Background: Coronary heart disease (CHD) is responsible for more deaths and disability in developed world, now affecting developing countries. The present study aims to evaluate clinical course, identification of risk factors and outcome of unstable angina (UA). **Methods:** An observational study of 30 days follow up of 100 patients of newly diagnosed UA was conducted. Socio-demographic, clinical, family history of risk factors, dietary, other lifestyle characteristics, Standard 12 leads ECG and BP recorded. Blood was collected for routine investigations and cardiac enzymes (serum Troponin-T quantitative and CPK-MB levels). Blood was collected in fasting state (glucose and lipid profile) and after 4 hrs of routine lunch for Triglyceride measurement. Patients were observed for complications after hospital discharge on OPD basis. **Results:** Middle aged patients are more likely to be selected for study (mean age 51.2 ± 6.4) being M:F ratio of 1.5:1. Amongst males 82% were smokers. 68 patients were having Postprandial triglyceride >160 mg% while 58 had low HDL levels (<40 mg%). Amongst 100 patients, 68% and 62% were found to be Diabetic and hypertensive respectively. Hospital outcome was good. 81.2% patients remained free of cardiac events during 30 days follow up while 13.7% were admitted with recurrent angina. There was no mortality during entire study period. **Conclusions:** Ischemic heart disease (IHD) entails high socioeconomic burden due to increased morbidity and mortality. Smoking, hypertension, diabetes mellitus and dyslipidemia are important cardiovascular risk factors in present study. Postprandial hypertriglyceridemia was found to be strongly associated with Diabetes Mellitus. Postprandial hypertriglyceridemia despite normal fasting triglyceride may be independent risk factor for atherosclerosis subsequently ischemic heart disease. Early identification, treatment and prevention of cardiovascular risk factors can decline the incidence, complications and related mortality.

Key Word: Angina Pectoris, Diabetes Mellitus, Dyslipidemia, Ischemic heart disease.

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INTRODUCTION

Coronary heart disease is the leading cause of death in western countries and now it is increasing problem in developing countries also. This sudden increase in

incidence of heart disease is seen in Indian population as due to adoption of sedentary life style along with change in dietary habits.¹ Coronary Heart Disease remain responsible for more than 54 million deaths in 2013.² The most important cause of coronary artery disease is atherosclerosis. Atherosclerosis of coronary arteries commonly causes myocardial infarction and angina pectoris. The association of atherosclerotic diseases and elevated fasting plasma LDL-C and plasma HDL-C are well established.³ The plasma level of Triglycerides varies widely throughout the day. Triglycerides levels are elevated for most of the day even in subjects of normal fasting triglyceride. Postprandial hypertriglyceridemia lasts for 3-6 hours in normal individuals which is exaggerated by next meal. Typical diets are associated with measurable postprandial lipidemia 18 hours per day.⁴⁻⁶

Recent data suggest that postprandial lipidemia may be due to familial, diabetes or complete or incomplete metabolic syndrome. Even the adverse effects of postprandial triglyceride on endothelial dysfunction have been reported in both normal and diabetic patients. Both hypertriglyceridemia and hyperglycemia induce endothelial dysfunction, oxidative stress to be common mediator of such effects.⁷⁻⁹ Despite our familiarity with disease, some fundamental characteristics remain poorly recognized and understood. Our study is aimed to study clinical correlation and identification of cardiovascular risk factors of ischemic heart disease (IHD).

METHODS

The present study was carried out in 100 patients of ischemic heart disease who were admitted for unstable angina in Department of Cardiology, Southern Railway Headquarters Hospital, Chennai from October 2016 to September 2017. In this prospective study all patients were enrolled applying inclusion and exclusion criteria.

Inclusion criteria

- Newly diagnosed unstable angina patients diagnosed on basis of classical angina chest pain or angina pain equivalents with ECG showing ST segment depression in two consecutive leads and normal serum Troponin-T.
- Quantitative level with fasting serum cholesterol <180 mg%.

Exclusion criteria

- Patients on lipid lowering therapy
- Suspected cases of Prinzmetal angina
- Known case of ischemic heart disease.
- Patients on hormone therapy.
- Hyperhomocysteinemia.
- Hypercoagulable states.
- Patient on pioglitazone for last month.
- Rheumatic heart disease.
- Hemoglobinopathies.
- Chronic liver disease and renal diseases.

A complete and detailed history of patient with biodata, past and family history especially for atherosclerosis risk factors (i.e. hypertension, diabetes mellitus, ischemic heart disease and TIA/Stroke) including dietary habits and addiction were noted. All patients consent was taken. Patient's vital data specifically Blood Pressure measured using standard sphygmomanometer. Clinical examination mainly cardiovascular system was done. The prerequisite for biochemical investigations was at least 12 hours of overnight fasting. All patients fasting blood samples were taken in pre-sterile plain and sugar bulbs for sugar and lipid profile measurement. Fasting lipid profile includes measurement of cholesterol, triglyceride, HDL, LDL and VLDL Levels. All patients were allowed to take routine

breakfast and standard meal, but patients were not allowed to have high fat containing food like cheese, butter, ghee, chocolate, ice cream etc. on the day of investigation. After four hours of lunch, blood sample was collected for serum triglyceride measurement. The collected blood samples were sent to our laboratory. The cut off values of fasting serum triglyceride >150 mg%, HDL cholesterol <40 mg% and postprandial triglyceride value is >160 mg%, LDL >130 mg% were considered significant according to AHA guidelines.

Statistical analysis: Statistical analysis was performed and data analyzed in form of mean and standard deviation. t-test was applied to test statistically significant difference in groups. The significance was decided on the basis of *p*-value. Two tailed *p*-value <0.05 were considered significant. Patients were observed for complication within 30 days of Hospital Discharge on follow up on OPD basis.

RESULTS

In present study, out of 100 patients 60 were males and 40 were females, M:F ratio 1.5:1. So male predominance was observed. There were 43 patients in 41-50 age group; next being 26 in 30-40 age group. While 21 and 10 patients were in 51-60 and more than 60 years age group respectively. The mean age of presentation was 47.1±5.2 years. When patients were placed in two groups of <55 years and >55 years, the calculated *p*-value was <0.05 which is statistically significant, suggesting patient aged <55 years are likely to be selected in study like our study as shown in Table no. 1.

Table 1: Distribution according to age and sex.

Age (Years)	Male	Female	Total
30-40	16	10	26
41-50	23	20	43
51-60	14	07	21
>60	07	03	10
Total	60	40	100

Serum triglyceride level >160 mg% after four hours of lunch is defined as post prandial hypertriglyceridemia. In present study, 68 patients (68%) showed post prandial hypertriglyceridemia. Furthermore, 41 out of 60 (68.33%) males and 27 out of 40 (67.50) females also showed post prandial hypertriglyceridemia as shown in table no. 2.

Table 2: Distribution according to Post prandial 4 hour triglyceride level (PP4TG)

PP4TG	Male	Female	Total
Normal	19	13	32
High	41	27	68
Total	60	40	100

Present study showed that 58 patients out of 100 had low fasting HDL level (less than 40 mg%) urthermore, 36 out of 60 (60%) were males and 22 out of 40 (55%) were females as shown in table no. 3.

Table 3: Distribution according to fasting HDL level.

HDL	Male	Female	Total
Low	36	22	58
Normal	24	18	42
Total	60	40	100

In present study; a total of 68 patients were suffering from diabetes mellitus (DM). 36 out of 60 (60%) were males while 32 out of 40 (80%) were females, as shown in table no. 4.

Table 4: Presence of diabetes mellitus.

DM	Male	Female	Total
Present	36	32	68
Absent	24	08	32
Total	60	40	100

In present study, out of 68 patients of Postprandial Hypertriglyceridemia, 57 were Diabetic; only 11 were non-diabetic. In remaining 32 patients having normal PP4TG level, 11 were diabetic and 21 were non-diabetic. There was strong association found between diabetes mellitus and high PP4TG levels. The calculated odds ratio is 10.1 as shown in table no. 5.

Table 5: Distribution according to PP4TG and diabetes mellitus.

Diabetes	Normal	PP4TG	Total
Present	11	57	68
Absent	21	11	32
Total	32	68	100

In present study, 62% patients were hypertensive in which 39 out of 60 (65%) were males and 23 out of 40 (57.5%) were females as shown in table no. 6.

Table 6: Presence of hypertension.

Hypertension	Male	Female	Total
Present	39	23	62
Absent	21	17	38
Total	60	40	100

In present study, 53% patients were smokers, 49 out of 60 males (81.66%) were smokers while only 4 were females (10%). So male smokers were found predominantly in study as shown in table no. 7. In current scenario, due to adoption of more westernized life style, even female smokers are also in increasing trend.

Table 7: Distribution according to smoking habit.

Smoking	Male	Female	Total
Present	49	4	53
Absent	11	36	47
Total	60	40	100

DISCUSSION

In present study, 69% patients were aged less than 55 years while 75% female and 62% male were aged less than 55 years with mean age of 51.2±6.4 these finding shows that middle aged patients are more likely to be selected for study like our study (p value <0.05). In Hiroyasu *et al* study, 55% were male and 45% were females with an average of 55.1±6.3 years which correlates well with our

study.¹⁰ Similar finding seen in Cohn *et al* study these findings suggest that all persons having ischemic heart disease they pass from impaired post prandial lipid metabolism and then they have fasting dyslipidemia.¹¹ In present study, out of 100 patients 68 (68%) showed serum triglyceride level >160 mg% after four hours of meal. Out of 100 patients, 38 out of 60 males (63.3%) and 30 out of 40 females (67.5%) showed postprandial hypertriglyceridemia. the mean fasting triglyceride and PP4TG was 136±19 mg% and 182±26 mg% respectively (p value<0.05). Furthermore, these data suggest that ischemic heart disease patients might have impaired postprandial lipid metabolism despite having normal fasting serum triglyceride levels. The association between postprandial hypertriglyceridemia and atherosclerosis should be proved by direct and indirect methods. Present study finding suggests that there is association between coronary heart disease and PP4TG levels being relative risk of 1.77. In Hiroyasu *et al* study, 58% male and 64% female patients showed post prandial hypertriglyceridemia (p value<0.05).¹⁰ In Nordestgaard *et al* study showed that non-fasting triglyceride level independently predicts myocardial infarction, ischemic heart disease and death.¹² Both studies correlates with present study finding. In our study, no relation found between HDL Level and high PP4TG level (p value 0.34). In present study, 68 Patients were Diabetic and 68 patients had post prandial hypertriglyceridemia. Amongst 68 patients having postprandial hypertriglyceridemia, 57 were diabetic and only 11 were non-diabetic. In remaining 32 patients, who had normal PP4TG level 11 were diabetic and 21 were nondiabetic. There was strong association found between diabetes mellitus and high PP4TG levels. The calculated odds ratio is 10.1 similar finding was found in Axelton *et al* and Teno S *et al* study.^{13,14} In Malte *et al* study on post prandial hypertriglyceridemia and type 2 diabetes mellitus showed postprandial lipid intolerance despite having normal fasting triglyceride level and increased risk of macroangiopathy. In Teno S *et al* study also showed that postprandial hypertriglyceridemia despite normal fasting triglyceride may be an independent risk factor for early atherosclerosis in type 2 diabetes.¹⁴ In present study, 62% patients were hypertensive in which out of which 39 (65%) and 23 (57.5%) females were found to be hypertensive. Similar results found in Mannie V *et al* study which shows that early lipid lowering therapy and hypertension control decreases the incidence of coronary heart disease.¹⁵ In present study, 81.6% were male smokers while only 10% females were smokers. Cigarette smoking found to be major risk factor in the study. Smokers have more chances of myocardial infarction and angina even at a much younger age than do non smokers.¹⁶ People who smoke are up to four times likely to die from coronary heart disease

than nonsmokers.¹⁷ Hospital stay outcome was good. 81.2% patients remained free of cardiac events during 30 days follow up while only 13.7% were presented with recurrent ischemia. Similar results found in Dionoso *et al* study.¹⁸ 76.4% patients remained free of cardiac events and 11.7% had readmission for unstable angina. No mortality occurred during entire study period.

CONCLUSION

Ischemic heart disease is common in middle age patients with predominantly in males. Smoking, hypertension, diabetes mellitus and dyslipidemia are important cardiovascular risk factors for ischemic heart disease. Furthermore, in the present study, authors found statistically significance correlation between postprandial hypertriglyceridemia and incidence of ischemic heart disease even in patients having normal fasting triglyceride levels. These observations are in contrast that fasting triglyceridemia is major predictor of atherosclerosis suggesting that patients having higher postprandial triglyceride levels have higher risk of ischemic heart disease. There is statistically significant correlation found between postprandial hypertriglyceridemia and diabetes mellitus. So postprandial hypertriglyceridemia may be an independent risk factor for atherosclerosis in ischemic heart disease patients. So, evaluation of post prandial triglyceride level is important during clinical assessment of ischemic heart disease patients. Furthermore, early diagnosis and prompt treatment of cardiovascular risk factors can reduce mortality and morbidity related to ischemic heart disease. Limitations of study were small sample size, precise time interval for blood sample collection and dietary fat intake during meal which would have helped in analysis.

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