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# A prospective observational study on the evaluation of risk factors in patients diagnosed with coronary artery disease in tertiary care hospital

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ABSTRACT

Background: coronary artery disease is one of the most common types of cardiovascular disorder and it occurs when the coronary artery that supply blood to the heart muscle is compromised due to the accumulation of materials such as plaque/cholesterol atherosclerosis risk factors associated with coronary artery disease men are susceptible at 45, women at 55 include age, gender, genetics, etc,

Objective: To identify the patients at elevated risk for CAD, To identify patients required further investigation to confirm the diagnosis of CAD, To describe a management plan including lifestyle changes, medications, psychosocial support, cardiac rehabilitation, etc.

Methods: A prospective observational study was conducted for a period of 6 months, from CAD patients attending max cure hospital. The data was collected from the participants after consent. Relevant patient lifestyles and lab data were documented in the data collection form (DCF).

Results: The study findings are according to parameter wise, age categorization defines that in 51-60 ranging age group 27.22% that is the highest percent affected people are observed with CAD. Of the total number of subjects participated in the study (n=202) the gender-wise comparison males (144) are more than females (58).To observe patient region, urban people (68%) are mostly affected with CAD than rural people (32%). To identify risk factors of CAD, patients with DM (34.67%), HTN (23%), smoking (17.32%), alcohol (25.74%), and obesity (13.86%) are the major risk factors associated with CAD. Based on family history a total of 21 members were identified out of 202, among them with CAD were 7, with CKD were 6, with HTN were 5 and with DM were 3 members respectively. According to the past history in a total of 202 members, patients with Cerebrovascular accidents were 4, patients with MI/UA were 20, and CKD were 4 respectively.

Conclusion: Evaluation of risk factors in patients with coronary artery disease in a tertiary care hospital was observed. Age, Diabetes mellitus, Hypertension, Smoking, Alcohol, and Obesity are more causing risk factors than others.

Key words:
CAD, Cardiovascular disease, prospective observational study, rural people, risk factors.

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## INTRODUCTION

The heart is regarded as the major circulatory organ and it is divided into 4 chambers a right and left atrium(atria) and a right and left ventricle(v).the conduction system consist of 4 major components which includes the senatorial node(SA)(which determines the rate of contraction for cardiac muscles),atria ventricular (Av) node (which transits impulses from the SA node through the atria ventricular(Av) bundle to the bundle of his ), Atria ventricular (Av)bundle,(which conducts impulses from the SA node to the AV node) and the bundle of this (which transmits impulses form the Av node to the ventricular walls).The values of the heart include the aortic value., mitral valve to the myocardial walls pulmonary valve and tricuspid valve. The supply of blood is facilitated by the coronary arteries [1]. The 3 major coronary trunk; that supply blood to specific segments to the heart include the anterior descending branch of the left coronary artery; the circumflex branch of the left coronary artery and the right coronary Artery [2]. The 3 anatomic patterns of destruction of the coronary blood supply, depending upon the crux are under the right coronary artery preponderance, balanced cardiac circulation and the left coronary preponderance [3]. The 2 main coronary arteries are the left main and right coronary arteries Coronary artery disease occurs when the arteries that supply the heart muscle become compromised due to the accumulation of materials such as cholesterol (plaque on the inner walls which is sometimes regressed to as atherosclerosis. Due to this, there is decreased in the supply of blood (ischemia) which also means decreased oxygen levels. This subsequently causes pain (Angina) or a heart attack. Its progressive complications include arrthymia, heart failure and subsequently death. The main causes risk factors of the CAD are atherosclerosis (increase cholesterol/plaque) obesity, (BMI >30 KG/M2>) heart diseases (risk factors), smoking (increase cholesterol), diabetes, etc, primary symptoms include chest pain, dyspnea, pain in arm and shoulders, etc [4].

CAD is usually diagnosed with ECG,stress test, cardiac catherization,heart CT scan,(prevalence of calcium deposits to artery),positron emission tomography (PET), etc. Medication administered for CAD include NSAIDS (Aspirin), Nitrates (isosorbide acetate), beta blockers (Atenolol),ACE inhibitors (enalapril) ARB (Lasortan). Medical interventions for CAD include percutaneous coronary intervention, coronary artery bypass grafting (CABG), Balloon angioplasty etc., CAD can be prevented by assessing and managing like increase cholesterol, increase blood pressure, diabetes, symptoms risk factors, obesity, stress etc; maintaining a healthy lifestyle is also an important factor [5].

**MATERIALS & METHODS**

The study was conducted to evaluate the risk factors in patients diagnosed with CAD in a tertiary hospital. The patients were enrolled in the study by their visit with known or suspected criteria of CAD. The total study population comprised of 202 coronary artery disease patients aged between 20-80 years at that time of their visit. It is a prospective observational study the design was enabled to determine the risk factors and its rate among CAD patients and description of their studying from CAD. The protocol and data collection form was submitted in Chaitanya College of pharmacy education and research after the review of study documents by the members of department the study was approved.

**RESULTS**

The total numbers of cases collected were 202. Cases are collected from Max cure group of hospitals.

**Table 01: Patient Age Categorization (N=202)**

The following percentages of patients belonging to the respective age groups have participated in the study.

| AGE | NUMBER OF PATIENTS | PERCENTAGE |
|---|---|---|
| 21-30 | 12 | 5.94 |
| 31-40 | 34 | 16.83 |
| 41-50 | 39 | 19.30 |
| 51-60 | 55 | 27.22 |
| 61-70 | 41 | 20.29 |
| 71-80 | 21 | 10.39 |

**Table 02: Patient Demographics (N=202)**

| Gender | N=(202) |
|---|---|
| Male | 144 |
| Female | 58 |

**Table 03: Class of drugs prescribed to patients**

| Class of drugs | Number of patients | Proportion |
|---|---|---|
| ACE/ARB | 73 | 36.16% |
| Statins | 20 | 9.99% |
| Anti platelets | 20 | 9.99% |
| Beta blockers | 93 | 46.03% |
| ALD antagonists | 13 | 6.43% |

**Table 04: Evaluation of Risk Factors**

| Class of drugs | Number of patients | Proportion |
|---|---|---|
| ACE/ARB | 73 | 36.16% |
| Statins | 20 | 9.99% |
| Anti platelets | 20 | 9.99% |
| Beta blockers | 93 | 46.03% |
| ALD antagonists | 13 | 6.43% |

**DISCUSSION**

Coronary artery disease (CAD) is the leading cause of death globally, and claimed an estimated 17.9 million lives in 2015. Age, gender, smoking, obesity, dyslipidemia, physical inactivity, hypertension and diabetes mellitus (DM) are established risk factors for CAD. Most studies on predictors of CAD, however, have been carried out in Europe and North America, and little is known about the relative contribution of these risk factors in the Middle East. Coronary artery disease (CAD) being the major killer in developed countries is now promptly thriving in developing countries. The South Asian Countries share most of the burden of cardiovascular diseases in comparison with any other region globally. Recent estimates predict that cardiovascular diseases will be the greatest cause of death and disability in India by 2020.

Risk of Coronary artery disease was (69%) in males as compared to females (31%). Male preponderance was seen as compared to females with male to female ratio of 1.4:1. The purpose of the study is to assess different types of risk factors among the samples and to correlate their health status, life style, family history and also depending on geographical area and dietary habits during the past decades. In this study some risk factors are majorly triggered factors to develop CAD. The current study results identified that out of 202 patients majorly male patients71.28% expose to CAD then compare with the female patients 28.7%; this encountered point is similar to other studies.

In our study a total of 202 patients were enrolled. All the patients are from max cure hospitals secretariat Hyderabad. In this study 20-80 years patients were enrolled. Age group is divided and the percentage of the affected population is said to be as follows, in age group 21-30 12 members (5.94%) were reported with CAD. 31-40 age group 34 members (16.83%), 41-50 age group 39 members (19.30%), 51-60 age group 41 members (20.29%), 61-70 age group 41 members (20.29%), 71-80 age group 21 members (10.39%) were reported with Coronary artery disease. Leading percentage 27.22% was observed in age group 51-60. Secondly 20.29% was observed in age group of 61-70. In this study early elderly patients were mostly affected than compared with other group and in second place middle elderly patients stand .

In order to assess the risk factors patients with Diabetes mellitus, Hypertension, obesity, smoking, alcoholism, and family history were drawn. Among 202 the patients with DM include 70 (34.65%) ad without Diabetes mellitus 132 (65.34%).In a total of 70 diabetes positive, 54 patients were male (34.55) and 16 were female (27.58%) respectively. Patients with Hypertension include 46 (23%) among them males were 30 (27.83%) and females were 16 (20%), and without Hypertension 156 (77%).

Smoking patients were categorized into two habitual smokers were 12 out of 202 and chain smokers were 23. A total of 35(17.32%) show the risk factor smoking in the conducted study. Acute and chronic alcoholics were divided based on the data collected, 35 were acute or habitual alcoholics and 17 were chronic alcoholics. Total of 52 (25.74%) were having a habit of consuming alcohol out of 202 patients. Obesity is the major risk factor associated with CAD. In our study we have observed that 28 (13.86%) patients among them 16 male and 12 female have BMI >33 and they are considered as obese. Family history is also a major cause for CAD, a total of 15 members were having family history of different diseases. Among them with DM were 3, with HTN were 5, with CAD were 7 and with CKD were 6 respectively. Patients with already existed CAD were 25(12.37%) members out of 202. Based on the patient region in a sample of 100% urban include 68% and rural include 32%. according to that of past history patients were identified with different types of past histories among them Patients with cerebro vascular accident (CVA) were 4 (1.98%), with myocardial infarction or unstable angina were 20 (9.90%), and with CKD were 4 (1.98%) respectively. In this study we have observed different types of diagnosis tests to assess the risk of CAD and to know the blockage percentage of heart valves. ECG was one the main and primary test performed in most of the patients. By performing ECG we got know that there are different sub categories associated with it, specific conditions and problems related to CAD have been observed they are as follows, LVH (left ventricular hypertrophy) was observed in 15 patients, MI was observed in 9 patients , LBBB (left bundle branch block) was seen in 1 patient and RBBB

(Right bundle branch block) was seen in 1 patient respectively. Second most diagnostic test recommended and performed is CAG (coronary angiography). In this test SVD, DVD, TVD are parameters to be assessed. Patients with SVD are 6, with DVD 11, and finally with TVD are 3.

TMT is the third type of test and this was performed to 3 patients. LVDD (left ventricular diastolic dysfunction) was estimated by performing 2D-echo a total of 68(33.66%) patients out of 202 were having LVDD. In this patients with grade-I disease are 29, grade-II are 35 and grade- III are 4 respectively. As stress is also a major risk factor associated with CAD, a specific test called DSE (Dobutamine stress echocardiogram) was performed in 2 patients. MPI (Myocardial perfusion imaging) is a specific test which is performed in a patient. In the data collected LV (left ventricular) functioning of patients was noted. In a total of 202 LV function was good for 159 patients, mild for 17 patients, moderate for 19 patients, severe for 7 patients. Finally after diagnosing, medication pattern of patients were recorded. Most used drugs of patients were taken by enquiring the patient and the data was collected in data form. Among all 73 patients were consuming ACE/ARB inhibitors, 20 patients were taking statins, 20 patients were taking anti-platelet drugs, 93 were using beta blockers, and 13 were taking Aldosterone antagonists.

## CONCLUSION

This study has shown that Coronary artery disease is the leading cause of death worldwide. The study includes evaluation of risk factors in patients with CAD in a tertiary care hospital. In conclusion, age, gender, Diabetes Mellitus, Hypertension, obesity, family history, smoking and alcohol intake were strong and significant risk factors for causing CAD. According to the study the first and foremost risk factor was identified as diabetes mellitus (DM) 34.6%. It is the primary and a major risk factor to cause CAD and the next place stands for age. As the age increases risk of CAD also increases, on an average of 50-60 age group people are more prone to CAD. It takes a percentage of 27.2%. In the study when enquiring the patient, his/her social habitats were also noticed. Among all alcoholics, were more and as we know that alcohol intake is one of the most causing risk factor for CAD. On an average 25.74% risk is caused due to alcohol intake. Next causing risk factor was identified as hypertension (HTN). On an average it is about 22.7% when compared with other risk factors. According to the study smoking (17.3%), which has been identified as the 5$^{th}$ risk factor. Next comes obesity. Already in many studies it has been proved that obesity is the most causing risk factor for CAD. In this study on an average a total of 13.8% was accounted for obesity. Among them male were major than female. Finally, family history of the patients is also a risk factor which may lead to CAD. In the current study on an average of 11.3% risk is observed with family history of the patients.Based on the location/area of population urban people were more risky than that of rural people. The percentage of incidence of the disease was more in males than that of females. Finally based on the data collected, conclusions were drawn as risk factors such as diabetes mellitus, age, hypertension, smoking, alcohol; obesity and family history are the main and leading causes to cause CAD. About 80% of people need awareness regarding the CAD and the causative risk factors. Life style modifications are essential for people who have already diagnosed with CAD.

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## CONFLICTS OF INTEREST

The Authors(S) of this study hereby declares that there exist no conflicts of interest to DIVULGE.

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