Study of Prevalence of Coronary Artery Disease Among Diabetic Population in DAE Hospital

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Abstract:

This is a study of prevalence of coronary artery disease among diabetic population in department of atomic energy hospital. Cardiovascular disease is the leading cause of death in the people with diabetes. This risk is due to impact of diabetes on vessels and heart and the presence of risk factors like hypertension, dyslipidemia and obesity. The burden of CAD deaths is 26.6 percent in India.. About 212.4 million people is global prevalence. Hence, management of diabetes will include risk factor detection, screening for CAD and detection of other complications so that holistic approach and early diagnosis and management can be made
Study methodology and Aim-This is a retrospective study done in our Institution from Sep 2021 – Aug 2025 of 100 patients 20-79 years after obtaining ethical clearance and informed consent from all patients who had symptoms of chest discomfort, palpitations, dyspnea on exertion, sweating along with associated risk factors with DM on medications
Results- In our study we found that males <60 years were affected and about 50% (25/45) were below 45 years and females >60 years were affected and around 50 % (20/55) were below 45 years of age which was alarming and the duration of diabetes correlated with the development of CAD as it was higher in individuals with >3 years of diabetes. It was found that <45 years males and females had associated risk factors like obesity ,hypertension, dyslipidemia and family history of CAD which contributed to added prevalence in this age group. Risk factors like dyslipidemia, obesity, hypertension, family history were present in both sex out of which family history and hypertension scored more for CAD risk. HBa1c levels(<7) with tight control of sugars with OHA and insulin after 3 years of treatment were found in 20 of males and 15 of females only. The presence of symptoms of CAD was present in 47 patients and the rest 53 were asymptomatic which is in line with both national and international studies. Although males are affected more with CAD than females the mortality and morbidity is more with females which is also in line with national and international studies Conclusion- Diabetes mellitus is the most important risk factor for CAD which is well emphasized in this study and patients present with atypical symptoms or asymptomatic so early screening with ECG, ECHO /TMT is necessary for early diagnosis and management
KEY WORDS-Coronary artery disease, risk factors, hba1c levels, Diabetic population

Introduction:

Coronary artery disease is the leading cause of death in the people with diabetes. This risk is due to impact of diabetes on vessels and heart and the presence of risk factors like hypertension, dyslipidemia and obesity. Cardiovascular diseases include stroke, CAD (MI, angina pectoris), heart failure, peripheral artery disease, dilated cardiomyopathy and death. Diabetes is

increasing alarmingly in India and globally second .The burden of CAD deaths is 26.6 percent in India. Globally it was found that half of people aged 20-79 years have CAD (about 32percent) and they are unaware of their disease. About 212.4 million people is global prevalence. Various risk factors like tobacco, hypertension, obesity, unhealthy diets, sedentary life style, cholesterol, obesity play a vital role in the same. The progression of CAD is linked to mechanisms like oxidative stress, hypercoagulability. Endothelial dysfunction and autonomic neuropathy. The glucose toxicity and advanced glycation end products with other risk factors are triggers for CAD in diabetes. Insulin resistance and high sugar levels accelerate plaque formation by promoting vascular inflammation and stiffness. North America has the great prevalence of CAD in DM 46 percent and South East Asia second with rate of 42.5 percent. Therefore, screening of all diabetic population for cardiovascular diseases is the important step to reduce the morbidity and mortality. Hence, management of diabetes will include risk factor detection, screening for CAD and detection of other complications so that holistic approach and early diagnosis and management can be made

Study methodology

This is a **retrospective** study done in our Institution from S**ep 2021 – Aug 2025 of 100 patients** 20-79 years after obtaining ethical clearance and informed consent from all patients who had symptoms of chest discomfort, palpitations, dyspnoea on exertion, sweating along with associated risk factors with DM on medications

Risk factors

Factors taken into consideration for the study included age, sex, duration of diabetes mellitus (DM), dyslipidemia, smoking, and family history of metabolic syndrome and CAD. Cardiovascular disease screening was done in these patients with ECG, TMT, echo and angiogram if needed which tests the probability of CAD based on symptoms and asymptomatic patients as positive, negative so that early diagnosis made for management

Inclusion criteria-In this study, we included male and female patients who had symptoms of chest discomfort, dyspnoea on exertion, palpitations, sweating and asymptomatic patients with DM on medications

Exclusion criteria- Patients already having CAD, other forms of valvular diseases, cardiomyopthy, thyroid diseases, heart failure, type 1 DM, autoimmune diseases on medications with diabetes were excluded

Results-In our study we found that males <60 years were affected and about 50% (25/45) were below 45 years and females >60 years were affected and around 50 % (20/55) were below 45 years of age which was alarming and the duration of diabetes correlated with the development of CAD as it was higher in individuals with >3 years of diabetes. It was found that <45 years males and females had associated risk factors like obesity ,hypertension, dyslipidemia and family history of CAD which contributed to added prevalence in this age group. Risk factors like dyslipidemia, obesity, hypertension, family history were present in both sex out of which **family history** and **hypertension scored more for CAD risk. HBa1c levels(<7) with tight control of sugars with OHA and insulin after 3 years of treatment were found in 20 of males and 15 of females only**. **The presence of symptoms of CAD was present in 47 patients and the rest 53 were asymptomatic** which is in line with both national and international studies. **Although males are affected more with CAD than females the mortality and morbidity is more with females** which is also in line

with national and international studies

Table 1 - Prevalence of CAD according to sex
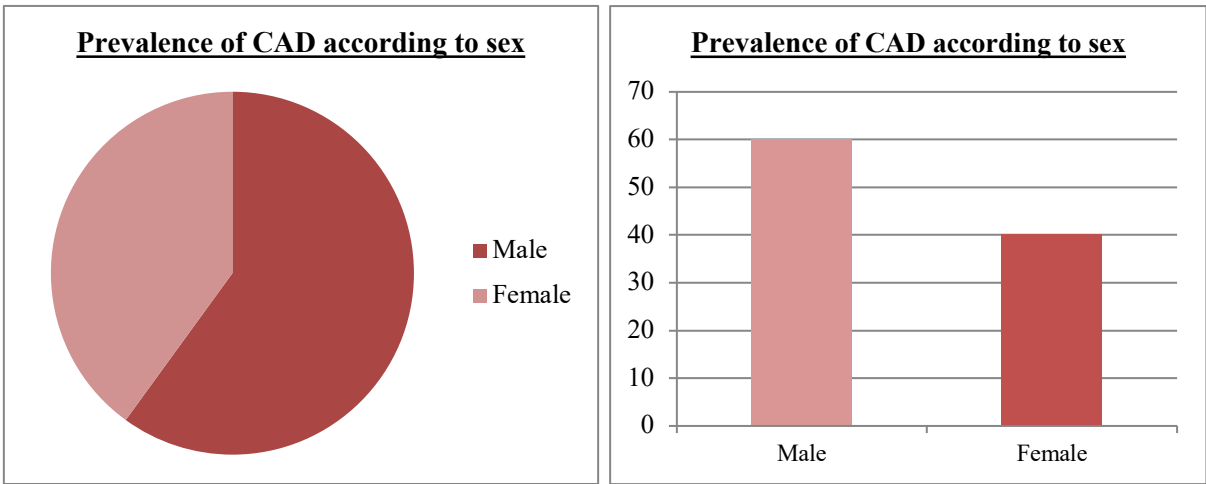
Male	Female
60	40

Table 2- Prevalence of CAD according to age

<60 years	<45 years	>60 years	<45 years
45	25	55	20
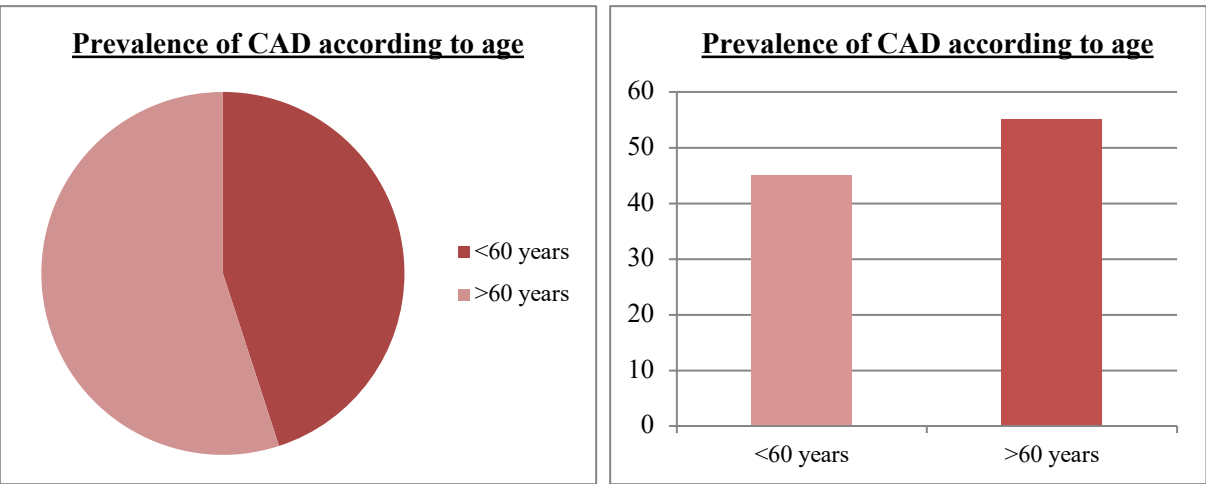
Table 3 - Symptoms of CAD in DM

Symptomatic	Asymptomatic
47	53
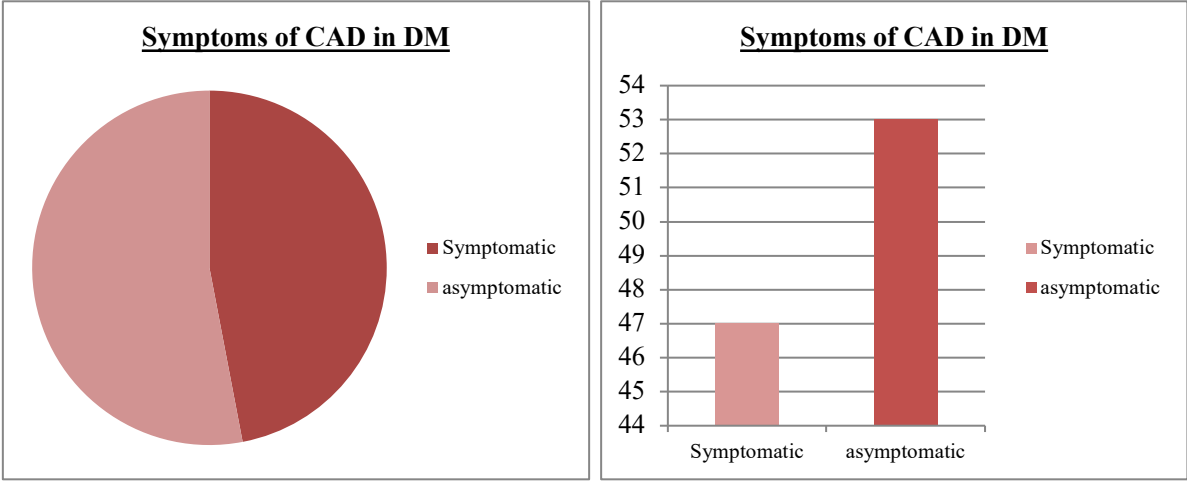
Table 4 - Prevalence according to duration of diabetes

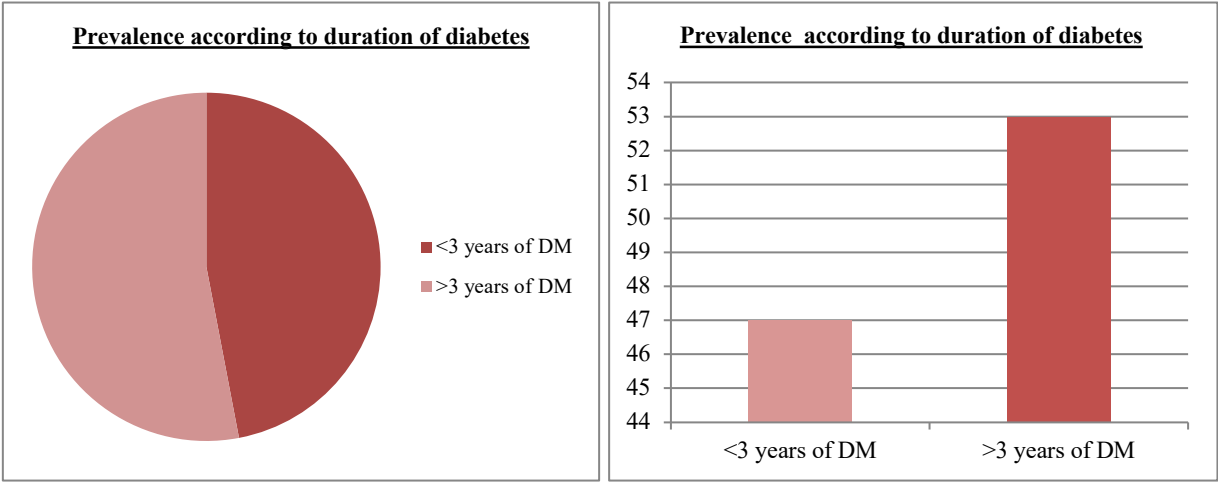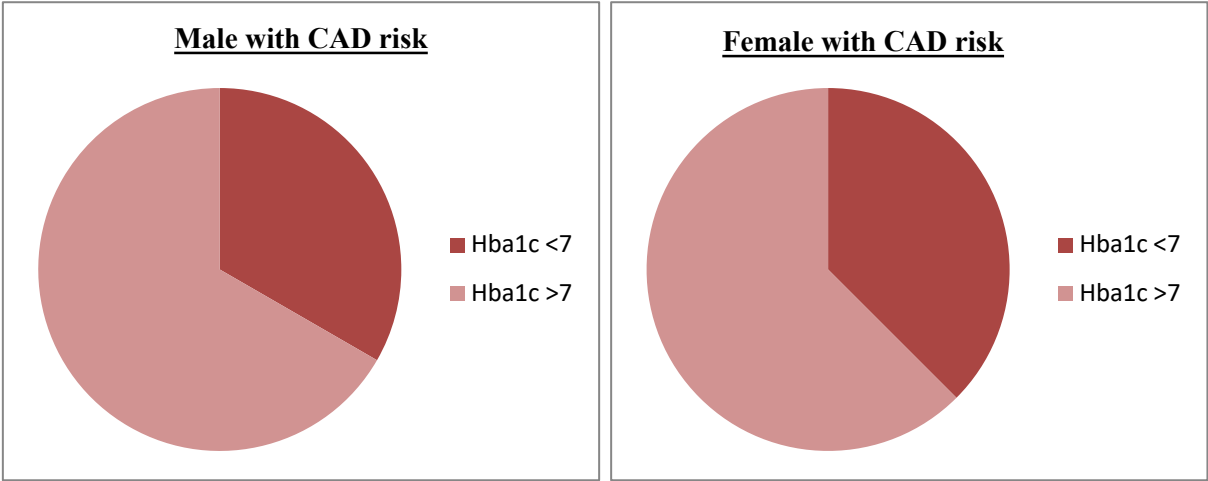| <3 years of DM	>3 years of DM
47	53

Table 5 - HBA1C levels with tight control and CAD risk

HBA1C levels with tight control and CAD risk	Male with CAD risk	Female with CAD risk
Hba1c <7	20	15
Hba1c >7	40	25

ASSOCIATION OF HBA1C CONTROL WITH CAD RISK IN BOTH SEXES
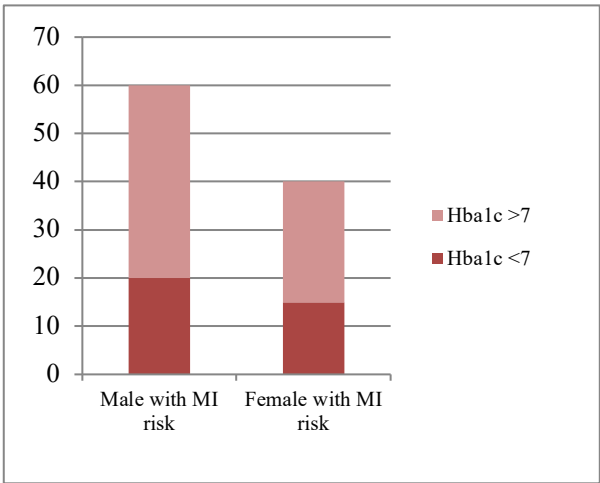
Table 6 - Risk factors with DM and CAD

Hypertension	Obesity	dyslipidemia	smoking	Family history
20	15	10	15	40
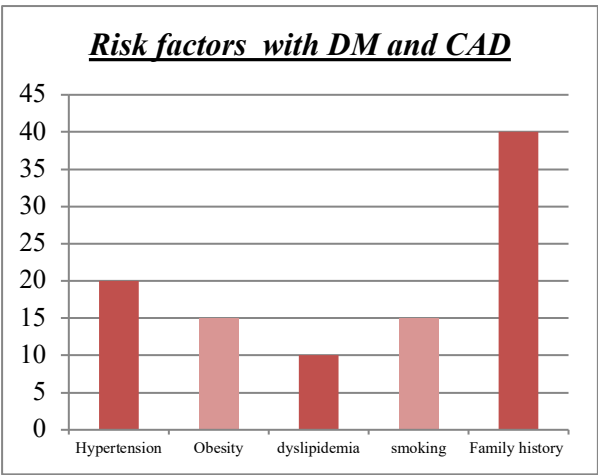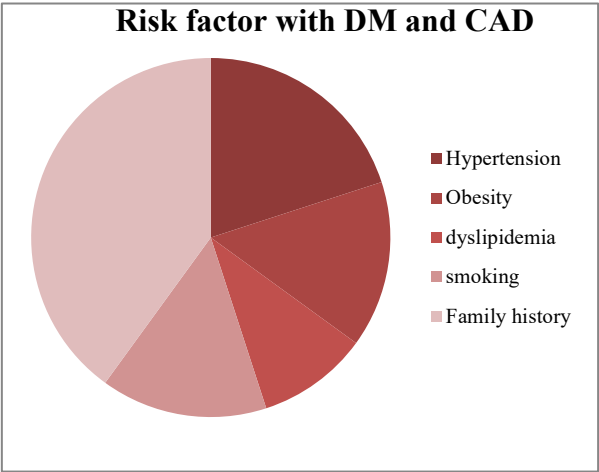
Comparison with national study – In our study it was found **that > 60 years were more at risk of CAD and asymptomatic patients were more seen (53) than symptomatic patients**.This is in line with national data and **in India about 77 million people above 18 years with DM ,the substantial cause of death was CAD** .Also the prevalence **was more with males than females and >60 years of age which was also in line with national data.** But **the 50 percent prevalence of CAD in younger age group in both males and females along with associated risk factors like hypertension, obesity, dyslipidemia and family history of CAD is the most alarming situation**. The most important predictor of CAD risk in diabetes control remained **HBa1c and those people with poor control (>7)were more at risk of CAD**

Comparison with international study- As with the international study the **females were affected** more than men but our study was in line with national data. **The age prevalence matches with international studies .The control of diabetes with hba1c<7 were less affected than persons with poor control of DM with hba1c >7 which is in line with**

international studies.

Limitations-Many patients with other cardiovascular diseases and other risk factors preponderance in CAD was not taken in this study in detail .Also the persons affected with other cardiovascular conditions like cardiomyopthy, valvular diseases with DM were excluded in the study .

Conclusion- Diabetes mellitus **is the most important risk factor for CAD, which is well emphasized in this study, and patients present with atypical symptoms or asymptomatic so early screening with ECG, ECHO /TMT is necessary for early diagnosis and management**

Implications to community-Our study of prevalence of CAD stressing on diabetes mellitus is of importance as the tight control is required for reduction in complications (microvascular and macrovascular) out of which CAD stands important as it increases the mortality. **In younger age group (45 years) it was found very significant to screen for CAD risk as 50 % people were affected from our study and they had other confounding risk factors like hypertension, obesity and family history of CAD, Hence early screening of diabetic patients for CAD is important with good screening tools like ECG/TMT so that CAD can be identified earlier for active management**

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