



FREQUENCIES OF HYPERTENSION, DIABETES MELLITUS, AND CHRONIC KIDNEY DISEASE AMONG CORONARY ARTERY DISEASE PATIENTS

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ABSTRACT

Background: Coronary artery disease (CAD) is becoming a major cause of mortality and morbidity in developing and developed countries now. Hypertension, diabetes mellitus as well as chronic kidney disease (CKD) are treated as some major comorbidities for coronary artery disease patients. We have very limited research-based information regarding the frequency of hypertension, diabetes mellitus and chronic kidney disease among coronary artery disease patients. **Aim of the study:** The aim of the study was to assess the frequencies of hypertension, diabetes mellitus and chronic kidney disease among coronary artery disease patients. **Methods:** This was a prospective observational study and was conducted in the Department of Medicine, Index Medical College and Research Centre, Indore, India from June 2020 to May 2021. A total of 83 patients with coronary artery disease (CAD) were included in this study as the study subjects. A convenient purposive sampling technic was used in sample selection. All the clinical as well as demographic information of the participants was recorded. A predesigned questionnaire was used in data collection. All data were collected, processed and analyzed by using the MS Office program. **Results:** In analyzing the frequencies of hypertension, diabetes and CKD among our total participants, we observed that only hypertension, diabetes and CKD were in 10%, 7% and 6% cases, respectively. On the other hand, hypertension with diabetes, hypertension with CKD and diabetes with CKD were present in 11%, 8% and 6% cases, respectively. Among our total participants, in 5% of cases, all the 3 diseases, hypertension, diabetes and CKD, were present and 47% were free from those diseases. **Conclusion:** Hypertension is the most frequent comorbidity in patients with coronary artery disease patients as a single comorbidity. More than 50% of CAD patients have any one or more types of comorbidities among hypertension, diabetes mellitus and CKD.

KEYWORDS : Chronic kidney disease, CKD, Coronary artery disease, CAD, Hypertension, Diabetes mellitus

INTRODUCTION

Nowadays, cardiovascular disease (CVD) has emerged as a major health burden in developing countries [1]. Among all the cardiovascular diseases, CAD (coronary artery disease) is becoming a major cause of mortality as well as morbidity in both developed as well as developing countries. As per recent epidemiological studies, it is generally predicted that, in the next few decades, more than half of the worldwide cardiovascular disease burden will be borne in the Indian sub-continent [2]. In a recent study, they stated that South Asian countries have the highest incidence of CAD (coronary artery disease) globally [3]. The global burden of disease study reported that, by the year 2020, this part (The south Asian part) will have more patients with atherosclerotic coronary artery disease than any other part of the globe [4]. Data related to different aspects of CAD (coronary artery disease) in India are not adequate, but it is highly prevalent in India [5]. Among Asian Indian individuals, CAD (coronary artery disease) tends to occur at the earlier stage with more extensive angiographic involvement contributed by genetic, metabolic, conventional and nonconventional risk factors [6,7]. In another Indian study, it was found that diabetes mellitus alone was a risk factor among 7.13% of cases and combined with hypertension, diabetes mellitus was in 22.25% of patients. [8] Besides these, in many studies, diabetes mellitus, hypertension and chronic kidney disease (CKD) are found as some major comorbidities and or risk factors of CAD. The objective of this study was to assess the frequencies of hypertension, diabetes mellitus and chronic kidney disease among coronary artery disease patients.

METHODOLOGY

This was a prospective observational study that was conducted in the Department of Medicine, Index Medical College and Research Centre, Indore, India from June 2020 to May 2021. In total, 83 patients with coronary artery disease were included in this study as the study subjects. According to the inclusion criteria of this study, only CAD (coronary artery disease) patients detected by echocardiography were

included as the study subjects. On the other hand, according to the exclusion criteria, patients with cardiomyopathy and/or concomitant valvular heart disease were excluded. The study was approved by the ethical committee of the mentioned hospital. Properly written consent was taken from all the participants before data collection. The whole intervention was conducted following the principles of human research specified in the Helsinki Declaration [9] and executed in compliance with currently applicable regulations and the provisions of the General Data Protection Regulation (GDPR) [10]. The age, gender, current smoking history, CAD risk factor profile, and BMI of the participants were recorded. Patients on lipid-lowering agents or total cholesterol level >240 mg/dl, triglycerides >150 mg/dl, low-density lipoprotein (LDL) >130 mg/dl and high-density lipoproteins <50 mg/dl (Female) and <40 mg/dl (Male) were considered as dyslipidemia. Fasting blood sugar levels >126 mg/dl (7.0 mmol/L) or 2-hour post-prandial glucose levels >200 mg/dl (11.1 mmol/L) were considered diabetes mellitus. In this study, one's systolic blood pressure >140 and/or diastolic blood pressure >90 mmHg and/or on anti-hypertensive treatment were considered as hypertension. BMI >25 was considered obesity. As the clinical manifestations, hematologic indices, left ventricular ejection fraction (EF) and treatment strategy were reported. A predesigned questionnaire was used in data collection. All data were collected, processed and analyzed by using the MS Office program.

RESULT

In this current study, among the total of 83 participants, 66% were male, whereas the rest 34% were female. So, male participants were dominating in number and the male-female ratio was 2:1. In analyzing the ages of the participants, we found that the highest number of patients were from the 41-50 year's age group which was 48%. Besides this, 18% and 23% were from the 30-40 and the 51-60 year's age groups, respectively, which was noticeable. In this study, as the extent of disease, we found 34%, 20%, 28%, 17% and 1% of CAD patients were with single vessel, double vessel, triple vessel,

normal coronaries and insignificant coronary artery disease, respectively. The mean waist circumference, hip circumference, FBS (mmol/l) and HbA1C were found as 89.31cm, 104.52 cm, 7.38 and 6.57, respectively. On the other hand, the mean total cholesterol (mg/dl) (%), LDL (mg/dl), HDL (mg/dl), and TG (mg/dl) were 172.36, 113.62, 35.78, 186.39, respectively. Serum creatinine (mg/dl) and ESR (mm in 1st hour) were found as 1.5 and 27.34, respectively. In analyzing the frequencies of hypertension, diabetes and CKD among our total participants, we observed that only hypertension, diabetes and CKD were in 10%, 7% and 6% cases, respectively. On the other hand, hypertension with diabetes, hypertension with CKD and diabetes with CKD were present in 11%, 8% and 6% cases, respectively. Among our total participants, in 5% of cases, all the 3 diseases, hypertension, diabetes and CKD, were present and 47% were free from those diseases.

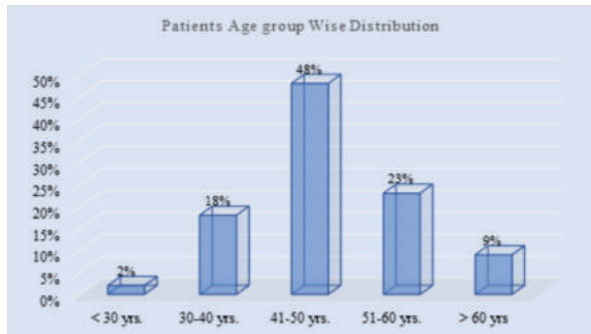


Figure I: Distribution Of Participants As Per Age In The Year. (N=83)

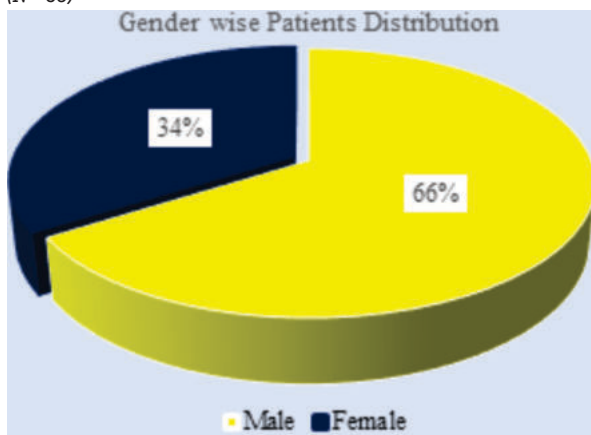


Figure II: Distribution Of Participants As Per Gender. (N=83)

Table 1: Extent Of Disease Among Participants.(N= 83)

Extent of disease	n	%
Single vessel	28	34%
Double vessel	17	20%
Triple Vessel	23	28%
Normal coronaries	14	17%
Insignificant CAD	1	1%

Table 2: General Laboratory Findings Among Participants. (N= 83)

Variable	Mean	SD
Waist Circumference(cm)	88.31	12.42
Hip Circumference(cm)	104.52	19.06
FBS (mmol/l)	7.38	1.11
HbA1C	6.57	1.28
T. Cholesterol (mg/dl) (%)	172.36	32.34
LDL (mg/dl)	113.62	23.42
HDL (mg/dl)	35.78	6.37
TG (mg/dl)	186.39	26.18
S creatinine (mg/dl)	1.5	0.1
ESR (mm in 1st hour)	27.34	3.21

Table 3: Hypertension, Diabetes And CKD Distribution Among Participants. (N=83)

Diseases	n	%
Only hypertension	8	10%
Only diabetes	6	7%
Only CKD	5	6%
Hypertension & diabetes	9	11%
Hypertension & CKD	7	8%
Diabetes & CKD	5	6%
Hypertension, diabetes and CKD	4	5%
Free from 3 diseases	39	47%

DISCUSSION

This study aimed to assess the frequencies of hypertension, diabetes mellitus and chronic kidney disease among coronary artery disease patients. Some studies reported that the prevalence of coronary artery disease (CAD) is increasing along with the rising prevalence of its conventional risk factors in India [9]. In this study, we observed that the highest number of patients were from the 41-50 year's age group which was 48%. Besides this, 18% and 23% were from the 30-40 and 51-60 year's age groups, respectively, which was noticeable. CAD tends to be more aggressive at the younger stage [10]. The mean age of the study population was comparable to that of another study conducted by Maqbool Jafary et al. [11], 58±11 years by Sahed et al. [12] and 62±5 years in COURAGE trial [13] conducted in the USA. In our study, male participants were dominating in number and the male-female ratio was 2:1. Some studies reported that CAD is predominately a disease of men. [14,15] In this current study, in analyzing the frequencies of hypertension, diabetes and CKD among our total participants, we found that only HTN, diabetes and CKD were in 10%, 7% and 6% cases, respectively. On the other hand, HTN with diabetes, HTN with CKD and diabetes with CKD were present in 11%, 8% and 6% cases, respectively. Among our total participants, in 5% of cases, all the 3 diseases, hypertension, diabetes and CKD, were present and 47% were free from those diseases. Hypertension and dyslipidemia were also described as the major risk factors for CAD [16,17] and those were reported to be 35% and 60% respectively in patients with CAD [18]. Diabetes mellitus was found in 16% of a study population, was also found as a major risk factor for CAD and was well known to have an adverse influence on the prognosis [19]. As per the report of another study [20], patients with CKD were under-represented in clinical trials and as such, the evidence to support recommendations is limited, which is also reflected in our study. All the findings of this current study may be helpful in further similar studies.

Limitation Of The Study:

This was a single-centered study with small-sized samples. Moreover, the study was conducted over a very short period. So, the findings of this study may not reflect the exact scenario of the whole country.

CONCLUSION & RECOMMENDATION

As per the findings of this current study, we can conclude that hypertension is the most frequent comorbidity in patients with coronary artery disease patients as a single comorbidity. More than 50% of CAD patients have any one or more types of comorbidities among hypertension, diabetes mellitus and CKD. To get more specific results, we would like to recommend conducting similar studies in several places with larger-sized samples.

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