IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 21, Issue 6 Ser.8 (June. 2022), PP 14-17
www.iosrjournals.org

Frequencies of Hypertension, Diabetes Mellitus and Chronic Kidney Disease among Coronary Artery Disease

Sarker AC[1], Haque SMH[2], Ahsan MM[3], Hossain S[4], Jamil ABM[5]
[1]*Dr. Alok Chandra Sarker, Assistant Professor, Shaheed Ziaur Rahman Medical College, Bogura, Bangladesh.*
[2]*Dr. S.M. Shahidul Haque, Associate Professor, Shaheed Ziaur Rahman Medical College, Bogura, Bangladesh.*
[3]*Dr. Mohammad Morshedul Ahsan, Assistant Professor, Shaheed Ziaur Rahman Medical College, Bogura, Bangladesh.*
[4]*Dr. Md. Shahadat Hossain, Assistant Professor, Shaheed Ziaur Rahman Medical College, Bogura, Bangladesh.*
[5]*Dr. Abu Baqar Md. Jamil, Assistant Professor, Shaheed Ziaur Rahman Medical College, Bogura, Bangladesh.*
Corresponding Author: Alok Chandra Sarker, Assistant Professor, Shaheed Ziaur Rahman Medical College, Bogura, Bangladesh.

Abstract
Background: *Besides developed countries, coronary artery disease (CAD) is becoming a major cause of mortality and morbidity in the developing world now. Hypertension, diabetes mellitus and chronic kidney disease (CKD) are considered as some major comorbidities for coronary artery disease patients.* ***Objectives:*** *The aim of this study was to evaluate the frequencies of having hypertension, diabetes mellitus and chronic kidney disease among coronary artery disease patients.* ***Methods:*** *This prospective observational study was conducted in the department of Cardiology, Shaheed Ziaur Rahman Medical College, Bogura, Bangladesh during the period from June 2020 to May 2021. Total 97 patients with coronary artery disease were included as the study subjects for this study. This study was approved by the ethical committee of the mentioned hospital. A predesigned questionnaire was used in data collection. All data were collected, processed and analyzed by using MS Office and SPSS version 23 programs as per need.* ***Results:*** *In this study, among total 97 participants 51% (n=49) were found with any one or more comorbidities among hypertension, diabetes and CKD. On the other hand, 49% (n=48) were free from those 3 diseases. Among them 2% were with all the three comorbidities, 3% were with diabetes and CKD, 5% were with Hypertension and CKD and 11% were with hypertension & diabetes. As single comorbidity, hypertension diabetes and CKD were found in 14%, 8% and 4% patients respectively.* ***Conclusion:*** *Now a days, in Bangladesh coronary artery disease is highly prevalent with a major health challenge. Middle aged population and male people are mainly prone towards coronary artery disease. Hypertension, diabetes and CKD should be considered to be responsible for the increase rate of CAD mortalities.*

Keywords: *CAD, Hypertension, Diabetes mellitus, Chronic kidney disease, coronary artery disease, CKD.*

Date of Submission: 12-06-2022 Date of Acceptance: 27-06-2022

I. Introduction

Cardiovascular disease has emerged as a major health burden in developing countries [1]. Among all the cardiovascular diseases, coronary artery disease (CAD) is becoming a major cause of mortality and morbidity in both the developed as well as the developing countries. According to the recent epidemiological studies, it is generally predicted that, in the next decade, more than half of the worldwide cardiovascular disease risk burden will be borne in the Indian sub-continent [2]. In a study, they stated, the South Asian countries have the highest incidence of coronary artery disease globally [3]. The global burden of disease study suggests that, by the year of 2020, this part (South Asia) will have more individuals with atherosclerotic coronary artery disease (CAD) than that in any other region in the world [4]. Data related to different aspects of coronary artery disease (CAD) in Bangladesh are not adequate but it is highly prevalent in Bangladesh [5]. Among Asian Indians, coronary artery disease tends to occur at the younger age with more extensive angiographic involvement8 contributed by metabolic, genetic, conventional and nonconventional risk factors [6,7]. In a Bangladeshi study it was stated that, diabetes mellitus alone was a risk factor among 7.13% patient and combined with hypertension and diabetes mellitus were been in 22.25% patients. [8] Besides these, in many studies along with diabetes mellitus and hypertension chronic kidney disease (CKD) are found as some major comorbidities and or as the risk factors of CAD. The aim of this study was to evaluate the frequencies of having hypertension, diabetes mellitus and chronic kidney disease among coronary artery disease patients.

II. Methodology

This prospective observational study was conducted in the department of Cardiology, Shaheed Ziaur Rahman Medical College, Bogura, Bangladesh during the period from June 2020 to May 2021. Total 97 patients with coronary artery disease were included as the study subjects for this study. This study was approved by the ethical committee of the mentioned hospital. As per the inclusion criteria of this study, only coronary artery disease patients detected by echocardiography were included as the study subjects. On the other hand, as per the exclusion criteria, patients with cardiomyopathy and/or concomitant valvular heart disease were excluded from this study. The age, gender, CAD risk factor profile, current smoking history, BMI of the participants were recorded. Patients on lipid lowering agents or total cholesterol >240 mg/dl, triglycerides level >150 mg/dl, low-density lipoprotein (LDL) level >130 mg/dl and high-density lipoproteins level <50 mg/dl (Female) & <40 mg/dl (Male) were considered as dyslipidemia. Fasting blood sugar >126 mg/dl (7.0 mmol/L) or 2-hours post-prandial glucose >200 mg/dl (11.1 mmol/L) were considered as diabetes mellitus. In this study, one's systolic blood pressure (SBP) >140 and/or diastolic blood pressure (DBP) >90 mmHg and/or on anti-hypertensive treatment ware considered as hypertension. Family history of CAD was taken from the first-degree relatives before the age of 55 years in men and 65 years in women. BMI >25 was considered as the obesity. As the clinical manifestations, left ventricular ejection fraction (EF), hematologic indices, and treatment strategy were reported. A predesigned questionnaire was used in data collection. All data were collected, processed and analyzed by using MS Office and SPSS version 23 programs as per need.

III. Results

In this study, among total 97 participants, 78% were male whereas the rest 22% were female. So, male participants were dominating in number and the male-female ratio was 3.5:1. In analyzing the ages of the participants, we observed that, the highest number of patients were from 41-50 years` age group which was 47%. Besides this, 19% and 24% were from 30-40 and 51-60 years` age groups respectively which was noticeable. As the extent of disease, we found 32%, 22%, 27%, 18% and 2% CAD patients were with single vessel, double vessel, triple vessel, normal coronaries and insignificant CAD respectively. The mean waist circumference, hip circumference, FBS (mmol/l) and HbA1C were found as 89.22cm, 105.39 cm, 7.33 and 6.67 respectively. On the other hand, the mean total Cholesterol (mg/dl) (%), LDL (mg/dl), HDL (mg/dl), TG (mg/dl) were 174.16, 114.43, 36.55, 188.76 respectively. Serum creatinine (mg/dl) and ESR (mm in 1st hour) were found as 1.6 and 27.24 respectively. In this study, among total 97 participants 51% (n=49) were found with any one or more comorbidities among hypertension, diabetes and CKD. On the other hand, 49% (n=48) were free from those 3 diseases. Among them 2% were with all the three comorbidities, 3% were with diabetes and CKD, 5% were with Hypertension and CKD and 11% were with hypertension & diabetes. As single comorbidity, hypertension diabetes and CKD were found in 14%, 8% and 4% patients respectively.

Table 1: Age distribution of participants (N=97)

Age (Years)	n	%
<30	3	3%
30-40	18	19%
41-50	46	47%
51-60	23	24%
>60	10	10%

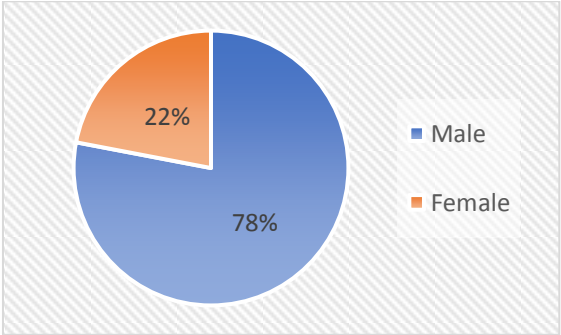

Figure 1: Gender distribution of participants (N=97)

Table 2: Extent of disease among participants (N=97)

Extent of disease	n	%
Single Vessel	31	32%
Double Vessel	21	22%
Triple Vessel	26	27%
Normal Coronaries	17	18%
Insignificant CAD	2	2%

Table 3: General laboratory findings among participants (N=97)

Variable	Mean	SD
Waist Circumference(cm)	89.22	12.35
Hip Circumference(cm)	105.39	18.87
FBS (mmol/l)	7.33	1.02
HbA1C	6.67	1.33
T. Cholesterol (mg/dl) (%)	174.16	31.91
LDL (mg/dl)	114.43	22.73
HDL (mg/dl)	36.55	6.29
TG (mg/dl)	188.76	25.72
S creatinine (mg/dl)	1.6	0.1
ESR (mm in 1st hour)	27.24	3.11

Table 3: Hypertension, diabetes and CKD distribution among participants (N=97)

Diseases	n	%
Hypertension & diabetes	11	11%
Hypertension & CKD	5	5%
Diabetes & CKD	3	3%
Hypertension, diabetes and CKD	2	2%
Free from 3 diseases	48	49%
With comorbidity (3 diseases)	49	51%

IV. Discussion

The study was aimed to evaluate the frequencies of having hypertension, diabetes mellitus and chronic kidney disease among coronary artery disease patients. Some studies have already revealed that, the prevalence of coronary artery disease is increasing along with the rising prevalence of its conventional risk factors in Bangladesh [9]. In this study, we observed that, the highest number of patients were from 41-50 years` age group which was 47%. Besides this, 19% and 24% were from 30-40 and 51-60 years` age groups respectively which was noticeable. Coronary artery disease (CAD) tends to be more aggressive at the younger age [10]. The mean age of the study subjects was comparable to that of another study reported by Maqbool Jafary et al [11], 58±11 years by Sahed et al [12] (In Pakistan) 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 3.5:1. Some studies reveled that, CAD is predominately a disease of men. [14,15] In this study, among total 97 participants 51% (n=49) were found with any one or more comorbidities among hypertension, diabetes and CKD. On the other hand, 49% (n=48) were free from those 3 diseases. Among them 2% were with all the three comorbidities, 3% were with diabetes and CKD, 5% were with Hypertension and CKD and 11% were with hypertension & diabetes. Hypertension and dyslipidemia were also 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 present in 16 % in 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]. In our study, as single comorbidity, hypertension diabetes and CKD were found in 14%, 8% and 4% patients respectively. As per the report of a previous study [20], patients with CKD are under-represented in clinical trials and as such the evidence to support recommendations is limited which also reflected in our study. Although we found patients with CKD in a lower number than other diseases but the mortality and morbidity are usually found higher in cases with the associations of CKD in several studies. As per the findings of some other studies, cardiovascular disease (CVD) was found as the the main cause of morbidity and mortality in patients with ESRD (End-stage renal disease) [21,22] or CKD [23].

Limitation of the study:
This was a single centered study with a small sized sample. So, findings of this study may not reflect the exact scenario of the whole country.

V. Conclusion & Recommendation

Now a days, in Bangladesh coronary artery disease is highly prevalent with a major health challenge. Rapid changes in lifestyle, unhealthy habits like smoking, sedentary life style, economic development, dietary factors and higher prevalence of hypertension, diabetes and CKD are considered to be responsible for the increase rate of CAD. For getting more specific findings we would like to recommend for conducting similar more studies with larger sized samples in several places.

Funding: *No funding sources.*
Conflict of interest: *None declared.*
Ethical approval: *The study was approved by the Institutional Ethics Committee.*

References

[1]. Reddy KS, Yusuf S. Emerging epidemic of cardiovascular disease in developing countries. Circulation 1998; 97;596-601.
[2]. Gupta R. Joshi P. MohanV. Reddy K S.Yusuf s.Epedemiological and causation of coronary heart disease & stroke in India.Heart 2008;94:16-26.
[3]. Joshi P, Islam S, Pais P, Reddy S, Dorairaj P, Kazmi K, et al. Risk factors for early myocardial infarction in South Asians compared with individuals in other countries. JAMA 2007;297(03):286-94.
[4]. Yusuf S, Reddy S, Ôunpuu S, Anand S. Global burden of cardiovascular diseases part I: general considerations, the epidemiologic transition, risk factors, and impact of urbanization. Circulation 2001:104(22):2746-53.
[5]. Islam AKMM, Majumder AAS. Coronary Artery disease in Bangladesh: A review. Indian Heart J 2013;65(04):424-35.
[6]. Deedwania P, Singh V. Coronary artery disease in South Asians: evolving strategies for treatment and prevention. Indian Heart J 2005;57:617-31.
[7]. Gupta R, Gupta VP. Meta-analysis of coronary heart disease prevalence in India. Indian Heart J 1996;48:241-5.
[8]. Ahmed, M., Rubaiyat, K. A., Saleh, M. A. D., Chowdhury, A. W., Khuda, C. K. E., Ferdous, K. A. F., & Amin, M. G. (2018). Clinical characteristics and angiographic profile of acute coronary syndrome patients in a tertiary hospital of Bangladesh. Bangladesh Heart Journal, 33(1), 10-15.
[9]. Islam AKMM, Mohibullah AKM, Paul T. Cardiovascular Disease in Bangladesh: A Review. Bangladesh Heart Journal. 2016; 31(2):80-99.
[10]. Enas EA, Yusuf S, Mehta J. Meeting of the International Working Group on Coronary Artery Disease in South Asians. 24 March 1996, Orlando, Florida, USA. Indian Heart J 1996;48:727-32.
[11]. Jafary MH, Samad A, Ishaq M , Jawaid SA , Ahmad M, et al. Profile of Acute Myocardial Infarction (AMI) in Pakistan. Pak J Med Sci. 2007; 23:485-9.
[12]. Hafeez S, Javed A, Kayani AM. Clinical profile of patients presenting with acute ST elevation myocardial infarction. JPMA 2010; 60:190.
[13]. Boden WE, O' rouke RA. COURAGE trial group. The evolving pattern of coronary artery disease in the US and Canada: Baseline characteristics of the clinical outcomes Utilizing Revascularization and Aggressive Drug Evaluation (COURAGE) trial. Am J Cadiol. 2007; 99:208-12.
[14]. Choudhury L,Marsh JD.Myocardial infarction in young patients.Am J Med1999;107:254-61.
[15]. Hong MK,ChoSY,HongBK,Chang KJet al.Acute myocardial infarction in young adults.Yonsei Med J1994;35:184-9.
[16]. Gaziano MJ, Manson JE, Ridker PM. Primary and secondary prevention of coronary heart disease. In : Libby P, Bonow RO.Mann DL , Zipes DP, editors. Braunwalds heart disease. A textbook of cardiovascular medicine.8th ed.Saunders: Philadelphia;2008:1119-48.
[17]. Reddy KS, Yusuf S. Emerging epidemic of cardiovascular disease in developing countries. Circulation 1998; 97:596-601.
[18]. Akanda M, Ali SY, Islam A, Rahman MM, Parveen A, Kabir M, et al. Demographic profile, clinical presentation & angiographic findings in 637 patients with coronary heart disease. FMCJ 2011; 6:82-5.
[19]. Ishaq M, Beg MS, Ansari SA, Hakeem A, Ali S. Coronary artery disease risk profiles at a specialized tertiary care centre in Pakistan. Pakistan J Cardiol 2003; 14:61-8.
[20]. Konstantinidis I, Nadkarni GN, Yacoub R, et al.Representation of patients with kidney disease intrials of cardiovascular interventions: an updatedsystematic review. JAMA Intern Med 2016;176:121–4.
[21]. US Renal Data System. Patient mortality and survival in ESRD. Am J Kidney Dis 34: S74 –S86, 1999.
[22]. Nakai S, Masakane I, Akiba T, Shigematsu T, Yamagata K, Watanabe Y, Iseki K, Itami N, Shinoda T, Morozumi K, Shoji T, Marubayashi S, Morita O, Kimata N, Shoji T, Suzuki K, Tsuchida K, Nakamoto H, Hamano T, Yamashita A, Wakai K, Wada A, Tsubakihara Y: Overview of dialysis treatment in Japan as of 31 December 2006. Ther Apher Dial 12: 428 – 456, 2008.
[23]. Dzau VJ, Antman EM, Black HR, Hayes DL, Manson JE, Plutzky J, Popma JJ, Stevenson W: The cardiovascular disease continuum validated: Clinical evidence of improved patient outcomes. part II: Clinical trial evidence (acute coronary syndromes through renal disease) and future directions. Circulation 114: 2871–2891, 2006.

Sarker AC, et. al. "Frequencies of Hypertension, Diabetes Mellitus and Chronic Kidney Disease among Coronary Artery Disease." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 21(06), 2022, pp. 14-17.