ORIGINAL ARTICLE

Demographic Characteristics and Risk Factors of Coronary Artery Disease in Patients Undergoing Percutaneous Coronary Intervention at a Tertiary Care Hospital in Islamabad

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ABSTRACT

Objective: To determine the demographic characteristics and risk factors of coronary artery disease in patients undergoing percutaneous coronary intervention (PCI) at cardiology department of a tertiary care hospital in Islamabad.

Materials and methods: This descriptive cases series study was done at cardiology department of Pakistan Institute of Medical Sciences (PIMS) Islamabad, during nine months of period from January to September 2021. All the patients having coronary artery disease based on clinical history and diagnosis including electrocardiogram (ECG), biochemical markers, or non-invasive tests like, echocardiography, exercise tolerance test (**ETT**), Thallium stress test and selected for PCI and of either gender were included. Pre PCI LVEF was assessed. All the patients underwent detailed medical history and routine laboratory investigation to assess the demographic information, risk factors of coronary artery diseases and indication of percutaneous coronary intervention (PCI). All the data was collected via self-made study proforma. Data was entered and analyzed by SPSS version 26.

Results: A total of 724 patients with coronary artery disease and underwent (PCI) were studied, their average age was 55.72+10.04 years and average BMI was 25.70+3.14 kg/m^2. Males were in majority 76.8%. Out of all 63.4% cases were hypertensive, 29.0% were diabetics, 41.4% having family history of CVD, 30.9% had a history of daily used of tobacco as shown in table.1 Pre PCI EF <30% was in most of the cases 59.9% and elective PCI status was 86.2%. As per anginal classification the class II and III were most common 60.1% and 27.2% respectively. Most of the cases 87.2% having intermediate PCI risk sore.

Conclusion: As per study conclusion hypertension, diabetes, smoking and family history were observed to the risk factors for CAD and intermediate PCI risk score was most frequent. Demographically age more than 45 years and males were commonest.

Keyword: CAD, Risk score, PCI, age, gender

INTRODUCTION

Coronary artery disease (CAD) is one of the world's most common causes of mortality and morbidity.[1] CAD is much more common in the elderly and occurs only rarely in those under the age of 40. However, recent research has revealed that an increasing number of young people are developing coronary artery disease (CAD) at a young age, most typically as a result of a stress, unhealthy lifestyle and the metabolic syndrome development.[1,2] Hypertension, smoking, diabetes, obesity and dyslipidemia, have all been identified as traditional risk factors for coronary artery disease in epidemiological research. The decrease in the incidence of heart disease can be attributed to advances in avoiding, recognizing, and controlling these risk factors.[3] The rising burden of heart disease in the undeveloped nations, particularly Pakistan, is due to the progressive growth and adoption of a western lifestyle.[4] Tobacco use, raised cholesterol, high fasting glucose, family history of Cardiovascular events, poverty, lack of access to education, overweight, high blood pressure, male sex, age, and sedentary habits are among the top leading factors linked to Coronary artery disease (CAD)/myocardial infarction (MI) in Pakistan.[5,6] Despite the fact that CAD patients have a considerable reduction in morbidity and death with percutaneous coronary intervention (PCI).[7] Percutaneous coronary intervention (PCI) is a minimally invasive, non-surgical therapy that aims to reduce coronary artery constriction or blockage and increase blood flow to ischemic tissue. This is generally implemented using the several of techniques, the most frequent of which are inflating the narrow portion or placing a stent in the artery to keep it open.[8] This activity discusses the indications for PCI and the role of the interprofessional team in the treatment of CAD patients.[8] Despite the notion that the developing world will be hit hardest by the hypertension (HT) and other chronic diseases epidemic.[4,9] In a developing countries like Pakistan, research on cardiovascular disorders is scarce.[4] This study has been done to determine the demographic characteristics and risk factors of coronary artery disease in patients undergoing percutaneous coronary intervention at cardiology department of a tertiary care hospital in Islamabad.

MATERIALS AND METHODS

This descriptive case series study was done at cardiology department of Pakistan Institute of Medical Sciences (PIMS) Islamabad, during nine months of period from January to September 2021. All the patients having coronary artery disease based on clinical history and diagnosis including electrocardiogram (ECG), biochemical

markers, or non-invasive tests like, echocardiography, exercise tolerance test (**ETT**), Thallium stress test and selected for PCI and of either gender were included. All the patients having history of renal impairment, chronic liver disease, history of cardiac surgery, previous history of the angioplasty (PCI) and coronary artery by-pass grafting (CABG) and who were not agreeing to participate in the study were excluded were excluded. After explaining the purpose of the study and taking written informed consent, participants were interviewed in Urdu and the answers were translated in English to enter in the research questionnaire. Pre PCI LVEF was assessed and categorized as normal (LVEF 50-70%) Mild dysfunction (LVEF 40-49%), moderate dysfunction (LVEF 30-39%) and Severe dysfunction (LVEF < 30%). All the patients detailed medical history and routine laboratory investigation to assess the demographic information, risk factors of coronary artery diseases and indication of percutaneous coronary intervention (PCI). All the data was collected via self-made study proforma. Data was entered and analyzed by SPSS version 26.

RESULTS

A total of 724 patients of coronary artery disease and underwent (PCI) were studied, their average age was 55.72+10.04 years and average BMI was 25.70+3.14 kg/m^2. Males were in majority 76.8% and females were 23.2%. Most of the cases 91.3% were able to read and write educationally and few were well educated. Mos of the cases were laborer 47.2% and 21.4% had elementary occupation. Almost all cases 99.0% were married only 1% were unmarried as shown in table.1.

Out of all 63.4% cases were hypertensive, 29.0% were diabetics, 41.4% having family history of CVD, 30.9% had history of daily used of tobacco as shown in table.1

Table 1: Demographic characteristics of the patients n=724

Variables		Statistics	
Age		55.72+10.04 years	
BMI		25.70+3.14 kg/m^2	
Gender	Male	556	76.8%
	Female	168	23.2%
Educational level	Able to read & write	661	91.3%
	Formal education	01	0.1%
	Illiterate	51	7.0%
	Well educated	11	1.5%
Occupation	Laborer	342	47.2%
	Business	15	2.1%
	Elementary occupation	155	21.4%
	Not Disclosed	03	0.4%
	Other	85	11.7%
	Professionals	124	17.1%
Marital status	Married	717	99.0%
	Single	06	0.8%
	Not Disclosed	01	0.1%
Hypertension	Yes	459	63.4%
	No	265	36.6%
Family history	Yes	300	41.4%
	No	424	58.6%
Diabetes mellitus	Yes	210	29.0%
	No	514	71.0
Tobacco uses	Never	496	68.5
	Former	4	0.5
	Current - every day	224	30.9

Pre PCI EF <30% was in most of the cases 59.9% and elective PCI status was 86.2%. as per anginal classification the class II and III were most common 60.1% and 27.2% respectively. Most of the cases 87.2% having intermediate PCI risk sore, followed by 9.9% had high risk score and very high-risk score was in 2.9% of the cases. Indications of PCI are presented in table.2

Table.2: Patients' distribution according to angina classification, EF, PCI status and risk score n=724

Variables		Frequency	Percent
Anginal classification	CCS IV	91	12.6
	CCS III	197	27.2
	CCS II	435	60.1
	CCS I	01	0.1
	Total	724	100.0
Left ventricular dysfunction	Yes	9	1.2
	No	715	98.8
LVEF pre- PCI	>30%	434	59.9
	30-39%	151	20.9
	40-49%	133	18.4
	50-70%	03	0.4
PCI status	Urgent	93	12.8
	Emergency	7	1.0
	Elective	624	86.2
PCI risk score	Low	00	00
	Intermediate	631	87.2
	High	72	9.9
	Very high	21	2.9
Indication of PCI	Rescue PCI for STEMI (after failed dose lytics)	13	1.8
	PCI for high risk Non STEMI or unstable Angina	324	44.8
	Immediate PCI for STEMI	85	11.7
	Others	298	41.2

DISCUSSION

The major cause of death is cardiovascular disease, particularly coronary disease. In order to appropriately prevent, diagnosis, and treatment coronary artery disease (CAD), it is necessary to identify risk factors and their importance in different genders.[12] Men, on the other hand, experience CVD at a relatively young age and are more prone to create coronary heart disease (CHD) over women, while women, on the other hand, are at a high risk of stroke, that also occurs more frequently as people become older.[13] Although in this study 724 patients of coronary artery disease and underwent (PCI) were studied, their average age was 55.72+10.04 years and average BMI was 25.70+3.14 kg/m^2. Males were in majority 76.8% and females were 23.2%. Similarly, Khan MS et al[4] reported that the males average age was 52.7 years and females average age was 55.8 years. Gheisari F et al[12] also fund similar findings regarding age as average female's age was 57.4+13.1 years and males' was 56.4+12.0 years, while inconsistently they found females in majority 69%. On other hand in the study of Iqbal SP et al[14] demonstrated that the males were 79.5% and females were 20.5% and average age of the cases was some lower 45±9.7 years as compared to this study. Talreja K et al[15] found almost similar findings regarding age, gender and average BMI.

In this study hypertension, diabetes, smoking and family history were observed to the risk factors for CAD. Consistently Iqbal SP et al[14] reported that the family history, hypertension, sedentary life style, dyslipidemia, diabetes mellitus and obesity were the commonest risk factors. On other hand Khan MS et al[4] reported that the commonest coronary artery risk factors include hypertension diabetes, poor dietary habits, overweight, fatty food consumption and smoking. Gheisari F et al[12] also fund similar findings as in the female population, older age, hypertension, DM, prior history of MI and HLP have a direct correlation with Ischaemic heart disease, however in the male population, advanced age, diabetes mellitus, and Hypertension have a significant link with Ischaemic heart disease. In this study and intermediate PCI risk score was in most of the cases. Although in the study of Mrdovic I et al[10] reported that the most of the cases 39.4% had very high high-risk class. Percutaneous coronary intervention (PCI) is the most often done invasive cardiology procedure worldwide. In 2010, about half a million cases in the United States underwent PCI, and there is little evidence suggesting that this number is decreasing.[16] In addition to the major identifiable CAD risk factors out study highlights few other important points which included younger patients having disease and most of them are from low socioeconomic group. They had low educational level and lacked understanding of importance healthy lifestyle including heart healthy diet and exercise. Further studies may help in devising strategies on community basis to eliminate these new trends in less privileged.

CONCLUSIONS

As per study conclusion hypertension, diabetes, smoking and family history were observed to the risk factors for CAD and intermediate PCI risk score was most frequent. Demographically age >45 years and males were commonest. Further large-scale multicenter studies are recommended on this subject.

REFERENCES

1   Zafirovska B, Otljanska M, Petkoska D, Kedev S. Risk Factor Distribution and Long-Term Outcomes in Young Patients Undergoing Percutaneous Coronary Intervention in Macedonia. Acta Clinica Croatica. 2019 Dec;58(4):583.
2   Yang WX, Yang Z, Wu Y, Qiao S, Yang Y, Chen J. Factors associated with coronary artery disease in young population (age ≤40): analysis with 217 cases. Chin Med Sci J. 2014;29(1):38–42.
3   Gurm Z, Seth M, Daher E, Pielsticker E, Qureshi MI, Zainea M, et al. (2021) Prevalence of coronary risk factors in contemporary practice among patients undergoing their first percutaneous coronary intervention: Implications for primary prevention. PLoS ONE 16(6): e0250801
4   Khan MS, Khan A, Ali A, Akhtar N, Rasool F, Khan H, ur Rehman N, Shah SH. Prevalence of risk factors for coronary artery disease in Southern Punjab, Pakistan. Tropical Journal of Pharmaceutical Research. 2016 May 11;15(1):195-200.
5   Haseeb A, Bilal M, Dar MI, Arshad MH, Amir RB, Hussain SM, Mian SK, Javed M, Sultan A, Arfeen AA. Predictors of Knowledge of Coronary Intervention in a Group of PCI Patients. Global Journal of Health Science. 2016 Jun;8(6):187.
6   Ismail J, Jafar T. H, Jafary F. H, White F, Faruqui A. M, Chaturvedi N. Risk factors for non-fatal myocardial infarction in young South Asian adults. Heart. 2004;90(3):259–263.
7   Bibi S, Khan A, Nadeem A, Mushtaq S, Khan GM. Assessment of utility values and QALYs after primary PCI with DP-Xience and BP-Biomatrix stents. Plos one. 2021 Jun 17;16(6):e0253290.
8   Ahmad M, Mehta P, Reddivari AK, Mungee S. Percutaneous Coronary Intervention. StatPearls [Internet]. 2021 Jan 16.
9   Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of the worldwide data. Lancet 2005; 365: 217- 223
10 Mrdovic I, Savic L, Krljanac G, Asanin M, Perunicic J, Lasica R, Marinkovic J, Kocev N, Vasiljevic Z, Ostojic M. Predicting 30-day major adverse cardiovascular events after primary percutaneous coronary intervention. The RISK-PCI score. International journal of cardiology. 2013 Jan 20;162(3):220-7.
11 Savic L, Mrdovic I, Asanin M, Stankovic S, Krljanac G, Lasica R. Using the RISK-PCI score in the long-term prediction of major adverse cardiovascular events and mortality after primary percutaneous coronary intervention. Journal of Interventional Cardiology. 2019 Oct 24;2019.
12 Gheisari F, Emami M, Raeisi Shahraki H, Samipour S, Nematollahi P. The role of gender in the importance of risk factors for coronary artery disease. Cardiology Research and Practice. 2020 Jul 29;2020.
13 Bots SH, Peters SA, Woodward M. Sex differences in coronary heart disease and stroke mortality: a global assessment of the effect of ageing between 1980 and 2010. BMJ global health. 2017 Mar 1;2(2):e000298.
14 Iqbal SP, Dodani S, Qureshi R. Risk factors and behaviours for coronary artery disease (CAD) among ambulatory Pakistanis. Journal of Pakistan medical association. 2004;54(5):261.
15 Talreja K, Sheikh K, Rahman A, Parkash C, Khan AA, Ahmed F, Karim M. Outcomes of Primary Percutaneous Coronary Intervention in Patients With a Thrombolysis in Myocardial Infarction Score of Five or Higher. Cureus. 2020 Jul 23;12(7).
16 Chin CT, Wong AS. The Appropriate Use of Percutaneous Coronary Intervention in Contemporary Clinical Practice. Proceedings of Singapore Healthcare. 2015 Mar;24(1):29-34.