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ORIGINAL ARTICLE

Prevalence of diabetes mellitus in patients with Ischemic heart diseases in Peshawar Institute of cardiology: A Cross-sectional study.

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ABSTRACT… Objective: To assess the prevalence of diabetes in patients with ischemic heart disease at the Peshawar Institute of Cardiology. **Study Design:** Cross-sectional study. **Setting:** Peshawar Institute of Cardiology, Peshawar. **Period:** Jan 2024 to June 2024. **Methods:** Was conducted, including 395 patients diagnosed with ischemic heart disease. Patient demographics, lifestyle factors, and clinical characteristics were recorded. The prevalence of diabetes, its type, and the relationship between diabetes and other factors like age, gender, body weight, smoking, and physical activity were analyzed. **Results:** The mean age of the participants was 58.19 ± 5.8 years, with 67.3% being male. Among the patients, 227 (57.5%) were diabetic, and 168 (42.5%) were non-diabetic. Type 2 diabetes mellitus was predominant, accounting for 98.2% (223/227) of diabetic patients, while only 1.8% (4/227) had type 1 diabetes mellitus. The majority of patients (45.1%) had normal weight, and 34.4% were smokers. Exercise habits varied, with 15.7% exercising daily and 26.3% leading a sedentary lifestyle. The most common clinical presentation was stable angina (44.8%), followed by unstable angina (24.6%), myocardial infarction (23.3%), and heart failure (7.3%). **Conclusion:** Diabetes is highly prevalent among patients with ischemic heart disease in this cohort, with 57.5% of patients being diabetic. Type 2 diabetes mellitus was the most common form. The high prevalence of diabetes and its strong association with ischemic heart disease emphasizes the need for targeted interventions to manage both conditions simultaneously, highlighting the importance of early diagnosis and lifestyle modification in this high-risk population.

Key words: Diabetes Mellitus, Ischemc Heat Disease, Myocardial Infraction.

INTRODUCTION

Diabetes mellitus is increasingly becoming a significant global health issue, with projections suggesting it could reach pandemic proportions by 2030, particularly in developing nations where the rise is most pronounced.[1] DM prevalence has been rising in Pakistan in line with worldwide trends, with total DM prevalence ranging 10-26% and varying from region to region.[2] By 2025, it is projected to rise to 4th place with an estimated 14.3 million people suffering from the disease. Each person with diabetes has an estimated yearly mean direct cost of $12,022 in US. It was also discovered that the financial burden on society is greatly increased by advanced age, more complications, and a longer duration of the condition.[3] Diabetes increases the risk of several major health issues, such as cardiovascular disease (CVD), early mortality, blindness, kidney failure, amputations, depression, and cognitive impairment.[4] Ischemic heart diseases is the most common complication associated with diabetes.

Chronic conditions such as diabetes mellitus (DM) and hypertension (HTN) are well-known risk factors for coronary artery disease (CAD). It has been determined that there are additional risk factors and behaviors linked to CAD, including as smoking cigarettes, sedentary lifestyle, having dyslipidemia, male gender, older population, having a positive family history, obesity, having high blood homocysteine, and having low estrogen levels.[5] Ischemic heart disease morbidity and mortality can be significantly decreased as a result of controlling these risk factors.[5] In Pakistan, mortality from ischemic heart disease

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is 410/100000.[6] The National Health Survey of Pakistan (NHSP) reports that 10% of people have diabetes and 17.9% of people have hypertension.[7]

Another major cause of death is myocardial infarction (MI). The frequency of occurrence increases with age. The frequency in individuals over 75 years of age is 10%.[8] The incidence of MI is 19/1000 in Females and 192/1000 in males in Pakistan.[9] In study another study prevalence of CVDs in the Punjab, Pakistan, community, surveying 6351 people (3224 females and 3127 males). 5242 of the 6351 participants were in good health, and the remaining 17.5% had cardiovascular disease. Women had a greater prevalence of CVD (18.30%) than did men (16.60%).[10] The prevalence of diabetes mellitus is about 50% in patients with ischemic heart disease in many countries.[11]

No data is available to tell us the prevalence of diabetic patients having ischemic heart diseases in patients admitted in Peshawar institute of cardiology. The purpose of this study to understand the prevalence of diabetes mellitus in IHD in our patients due to the significance of both conditions in the context of public health. This will assist policymakers in suggesting effective solutions and caregivers in focusing on this issue.

METHODS

A cross-sectional investigation that took place over the course of 6months Jan 2024 to June 2024 at Peshawar institute of cardiology Peshawar. The study recruited 395 patients having Ischemic heart disease of both genders age 30-70 years with old or newly diagnosed diabetes. Diabetes was diagnosed in patients having classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose ≥200 mg/dL (11.1 mmol/L). Prior permission to conduct the study was taken from the institutional research review board (IRB) (Ref No. IRC/24/104). Informed consent was taken from all enrolled participants after explaining the purpose of the study and benefits and risk involved. Coronary angiography was reviewed.

The demographic data including age, gender, BMI, residence, profession education, monthly income and socioeconomic status was recorded in Performa. Exclusion criteria were strictly followed to avoid bias in the study results.

Data Analysis Procedure

Data was analyzed using SPSS version 23. Quantitative variables like age and BMI were described in terms of mean ± standard deviation. Qualitative variables like gender, residence, profession, education, socioeconomic statuses, diabetes mellitus, type of diabetes mellitus, smoking, physical activity, family history etc were described in terms of frequencies and percentages. Diabetes mellitus was stratified by age, gender, BMI, smoking, physical activity and family history to control effect modifiers. Chi square or Fisher's exact test was applied.

RESULTS

A total of 395 patients of ischemic heart disease were included in the study. Table-I shows characteristics of these patients. Mean age was 58.19 ± 5.8 years. 266 (67.3%) were males. Most of the patients were of normal weight 178 (45.1%), 58 (14.7%) were underweight while overweight and obese patients were 100 (25.3%) and 59 (14.9%) respectively. 136 (34.4%) were smokers. Majority of the patients exercised 2-3 times a week. 62 (15.7%) patients had daily regular exercise. 104 (26.3%) exercise occasionally while the same number of patients were having completely sedentary life style. 227 (57.5%) were diabetic while 168 (42.5%) were non diabetic (Figure-1). Among the diabetic patients, 4 (1.8%) were having type 1 diabetes mellitus while the rest 223 (98.2%) patients were having type 2 diabetes mellitus. Most the patients had stable angina 177 (44.8%). 97 (24.6%) presented to the hospital with unstable angina, 92 (23.3% patients were having MI while 29 (7.3%) patients presented with others symptoms of ischemic (heart disease like heart failure.

Table-II shows symptoms of ischemic heart disease in diabetic and non diabetic patients. Unstable angina (29.6% vs 21.4%) and myocardial infarction (24.7% vs 21.4%) were more in diabetic patients compared to non diabetic patients respectively while stable ischemia was more

in non diabetic patients compared to diabetic patients (49.4%vs 41.4% respectively.) (p= 0.385).

Sample Characteristics	N	%
Gender		
Men Women	266 129	67.3 32.7
BMI		
Underweight (<18.5 Normal (18.5-24.9) Overweight (25-29.9 Obese (≥30)	58 178 100 59	14.7 45.1 25.3 14.9
Smoking		
Smokers Non smokers	136 259	34.4 65.6
Physical activity		
Daily 2-3 times a week Occasionally No activity	62 125 104 104	15.7 31.6 26.3 26.3
Type of diabetes		
Type 1 Type 2	4 223	1.8 98.2
Symptoms of IHD		
Stable angina Unstable angina Myocardial infarction Other	177 97 92 29	44.8 24.6 23.3 7.3

Table-I. Characteristic of ischemic heart disease patients (n= 395)
Note: Participants were on average 58.19 years old (SD 8.5 years)

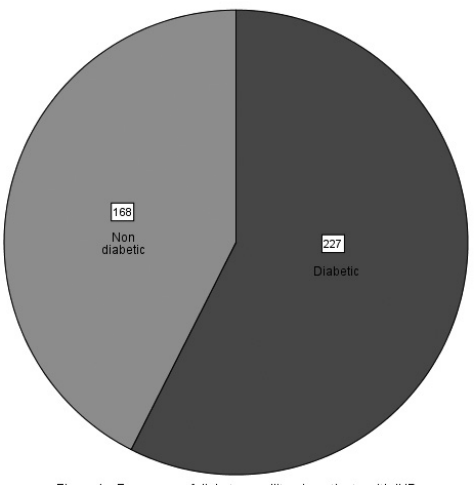

Figure-1. Frequency of diabetes mellitus in patients with IHD

Type of IHD	Diabetic	Non diabetic	Total	P-Value
Stable angina	94 (41.4%)	83 (49.4%)	177	0.385
Unstable angina	61(26.9%)	36(21.4%)	97	
MI	56 (24.7%)	36 (21.4%)	92	
Others	16 (7%)	13(7.7%)	29	
Total	227(100%)	168(100%)	395	

Table-II. Symptoms of ischemic heart disease in diabetic and non diabetic patients

DISCUSSION

The study examined the characteristics of 395 patients with ischemic heart disease (IHD), providing valuable insights into various demographic, lifestyles, and clinical factors associated with the condition. The following discussion highlights key findings and their potential implications for the management and understanding of ischemic heart disease. The mean age of patients was 58.19 ± 5.8 years, suggesting that IHD predominantly affects middle-aged individuals.[12]This aligns with global trends where ischemic heart disease is most prevalent in individuals aged 50 years and older. The fact that 67.3% of the participants were male is consistent with existing literature, which consistently demonstrates a higher prevalence of ischemic heart disease in men, particularly in younger age groups.

The data revealed that a significant proportion of patients were either overweight (25.3%) or obese (14.9%). These figures underscore the association between excess body weight and an increased risk of ischemic heart disease, as obesity is a well-established risk factor for atherosclerosis, hypertension, and diabetes—each of which further exacerbates the risk of heart disease.[13] The 45.1% of patients who were of normal weight also suggests that IHD is not exclusive to those with a higher body mass index, and other factors, such as genetics or underlying medical conditions, may contribute to the development of ischemic heart disease in these individuals. A majority of patients engaged in some form of physical activity, with 62 (15.7%) reporting regular daily exercise and 104 (26.3%) exercising occasionally. Regular physical activity is a known preventive measure for ischemic heart disease, as it helps improve cardiovascular health

by reducing blood pressure, cholesterol levels, and inflammation.

Epidemiological studies on ischemic heart disease (IHD) have been conducted across various Asian countries. Between 2007 and 2008, the prevalence of coronary heart disease (CHD) in China was reported to be 0.63%.[14] In 2002, the overall prevalence of coronary heart disease (CHD) in India was 8.2%.[15] However, data on the prevalence of ischemic heart disease (IHD) in Pakistan is limited. One study estimates the disease burden of IHD in Pakistan to be approximately 5.09 million cases.[16]

The study found that 57.5% of the patients were diabetic, with 98.2% of those having type 2 diabetes mellitus. Marwat et al. conducted a study on a population similar to ours, focusing on patients with ischemic heart disease (IHD) presenting with acute coronary syndrome (ACS). The study reported that the frequency of diabetes mellitus (DM) among these patients was 79 out of 331, accounting for 23.87%.[17] Another study reported that 22.0% of patients with ischemic heart disease (IHD) were found to have diabetes mellitus.[18] This is particularly concerning as diabetes, especially type 2 diabetes, is a well-established risk factor for ischemic heart disease. The presence of diabetes accelerates atherosclerosis, promotes endothelial dysfunction, and leads to poor glycemic control, all of which increase the likelihood of heart attacks and other ischemic events.[19,20] The high prevalence of diabetes in this cohort highlights the need for integrated care strategies that address both diabetes and heart disease simultaneously.

LIMITATIONS

While the study provides valuable insights into the characteristics of ischemic heart disease patients, there are several limitations. The study design does not allow for causal inferences, and the cross-sectional nature of the data limits our understanding of disease progression over time. Future research could benefit from longitudinal studies to track the outcomes of these patients and assess the impact of interventions on their health.

Additionally, a more detailed exploration of comorbidities, such as hypertension, hyperlipidemia, and family history of heart disease, could provide further insights into the multifactorial nature of ischemic heart disease. Moreover, it would be beneficial to explore the role of novel biomarkers and imaging techniques in predicting disease outcomes in this patient population.

CONCLUSION

Type II diabetes mellitus is a significant risk factor for ischemic heart disease. The high prevalence of diabetes mellitus observed among patients with IHD in our study underscores the severity of the issue and highlights the urgent need for targeted interventions and focused management strategies to address this critical comorbidity.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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2	Shahana Raza	Topic selection literature review. Helping in reviewers selection.	
3	Omar Khattab	Data Collection, Typing and literature review.	