



Association of Diabetes and Hypertension as risk factors with Ischemic Heart Disease among patients visiting a Public Sector Tertiary Care Hospital of Karachi, Pakistan

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Abstract

Background: Ischemic Heart Disease (IHD) is a leading cause of morbidity and mortality worldwide. IHD results from myocardial ischemia, and occurs whenever perfusion outgrows the demand. Though lethal, but can be prevented by modification of predisposing conditions, most important are diabetes and hypertension. Almost fifty percent of IHD patients are found hypertensive with or without being diabetic. The objective of the study was to determine association of diabetes and hypertension as risk factors for IHD patients

Methods: This was a hospital-based cross-sectional study that included 199 IHD patients of 35-70 years age, visiting Civil Hospital Karachi, a tertiary care public sector hospital, from September 2017 to January 2018 by using non-probability convenient sampling technique. The patients were approached in the hospital and briefed about the purpose of the study. A pre-tested, structured close ended questionnaire was used to collect the data. Data entry and analysis were done by using SPSS version 20.0. A p-value of <0.05 was considered as statistically significant.

Results: Out of 199 participants, 156 (78%) were males while 43 (22%) were females; 119 (60%) were 56-65 years of age. Family history of ischemic heart diseases was unremarkable in 126 (63%) patients. In total, 122 (61%) were diabetic; among them, 24 were of less than 40years and 98 of more than 40years of age. The older age of the diabetics had a direct association with the risk of IHD (p-value <0.05). About 83% had a non-significant family history for diabetes; and 83% of the total study participants were having a sedentary lifestyle.

Out of 199, 166 (83%) had never checked their blood pressures earlier. The lifestyle, diet, addiction, and duration of hypertension had a strong association with IHD (p-value <0.05).

Conclusion: IHD occurs more frequently in males of 56-65 years age, with insignificant family history for IHD and diabetes. The IHD is associated with hypertension and diabetes along with sedentary lifestyle, unhealthy diet and smoking/tobacco addiction.

Keywords: Ischemic Heart Disease, Hypertension, Diabetes, Tertiary Care Public Sector Hospital

Introduction

Ischemic heart disease (IHD) is a leading cause of morbidity and mortality worldwide (1). IHD results from myocardial ischemia, and occurs whenever perfusion outgrows the demand. Ischemia, on one hand leads to depletion of oxygen and essential nutrients, and on the other hand causes accumulation of carbon dioxide and metabolites (2). The cause of ischemia is suggested to be any coronary artery pathology that leads to its obstruction which is mostly due to atherosclerosis (3). IHD includes myocardial infarction, angina pectoris, chronic IHD with heart failure and sudden cardiac death.

Though this may be a lethal condition, yet can be prevented by modification of predisposing conditions, which include diabetes, hypertension, smoking, altered lipid profile and obesity (4). Among these modifiable risk factors, the most important are diabetes and hypertension. Every second IHD patient has been found hypertensive with or without being diabetic.

As far as hypertension is concerned, both systolic and diastolic blood pressure are important. Hypertension increases the risk of IHD by forty-six percent (5).

As diabetes induced dyslipidemia increases the risk for atherosclerosis, so the incidence of atherosclerosis is twice higher in diabetic patients as compared to non-diabetics. This not only predisposes a person to IHD but also to stroke and gangrene formation (6).

The risk of developing of IHD can be reduced by modifying risk factors such as diabetes and hypertension along with lifestyle modification. Strict control of diabetes, optimizing blood pressure within its normal confines along with exercise, dietary restriction and lifestyle modification has shown encouraging results in reducing the incidence of IHD in the western world.

The purpose of this study was to determine diabetes and hypertension as risk factors for IHD among patients visiting public sector tertiary care hospital of Karachi.

Methodology

Study Design: Cross-sectional

Study Setting: Civil Hospital Karachi (CHK), Pakistan.

Study Duration: September 2017- January 2018.

Sample Size: 199. All those patients who could be approached during study period were made part of the study.

Sampling Technique: Non-probability convenient sampling technique

Inclusion Criteria: The patients of 35-70 years age, visiting CHK, presenting with chest pain and shortness of breath with previous diagnosis of IHD.

Exclusion Criteria: The patients with heart failure and valvular heart diseases or less than 35 years and more than 70 years age.

Study Tool: A pre-tested, structured close ended questionnaire was used to collect the data; which included the demographic data, such as age and sex, diagnosis of IHD and duration of the disease along with family history, lipid profile, blood glucose (fasting or random) monitoring in diabetics, treatment modality of diabetes (lifestyle changes, exercise, medicines, insulin) and family history of diabetes. It also included information regarding hypertension, its duration and treatment; addiction or habit of any substance, chest pain and its severity with rest and exercise, type of lifestyle (sedentary/active), type of diet intake (as per advise of healthcare provider or not) and any existing co-morbidity other than DM, HTN and IHD.

Ethical Consideration: The data were collected after the approval from IRB of Dow University of Health Sciences. An informed consent of the study participants was taken; they were assured of privacy and confidentiality.

Statistical Analysis: The data were analyzed using SPSS 20.0. Simple descriptive statistics (frequencies and percentages) were computed for each categorical variable. Mean and standard deviations were calculated for continuous variables. Difference between categorical variable for statistical significance was assessed by chi square test at a significance level of <0.05.

Results

Total 199 patients participated, 156 (78.4%) were males while 43 (21.6%) were females. Of these, 7 (3.5%) were 35-45 years of age. Only 73(36.7%) participants had significant family history of IHD. Among them, 122 (61.3%) were diabetic, while 77 (38.7%) people were normoglycemic. Out of these 122, 24 (12.1%) were diagnosed at less than 40 years of age, while 98 (49.2%) were diagnosed at more than 40 years of age. Family

history of diabetes in patients with IHD was positive only in 33 (16.6%) participants.

Out of 199, 33 (16.6%) patients were known hypertensive before the diagnosis of IHD, while 166 (83.4%) never checked their blood pressures earlier. Of these, only 33 (16.6%) had an active lifestyle [Table I].

Table I. Socio-Demographic & Clinical Data of the Study Participants

VARIABLES		FREQUENCY (PERCENT)
Gender	Male	156(78.4%)
	Female	43(21.6%)
Age	35-45	7(3.5%)
	46-55	56(28.1%)
	56-65	119(59.8%)
	65-70	17(8.5%)
Family History of Heart Diseases	Positive	73(36.7%)
	Negative	126(63.3%)
Diabetes (Hyperglycemia)	Positive	122(61.3%)
	Negative	77(38.7%)
Age of Onset of Diabetes	<40years	24(12.1%)
	>40years	98(49.2%)
Family History of Diabetes	Positive	33(16.6%)
	Negative	166(83.4%)
Hypertension	Positive	33(16.6%)
	Negative	166(83.4%)
Lifestyle	Active	33(16.6%)
	Less active / sedentary	166(83.4%)

The onset of diabetes after 40 years of age was found statistically significant risk factor (p-value, 0.000) [Table II]. The other factors, like age, gender, family history of IHD and of diabetes, smoking/pan addiction, lifestyle, diet, and serum cholesterol levels were not significant or diabetic patients.

Table II. IHD Patients with their Respective Age of Onset of Diabetes

Age of onset of Diabetes	Number of Patients
<40 years of Age	24
>40 years of Age	98

There was statistically significant (p-value, 0.002) association of smoking/pan addiction with hypertension [Figure I].

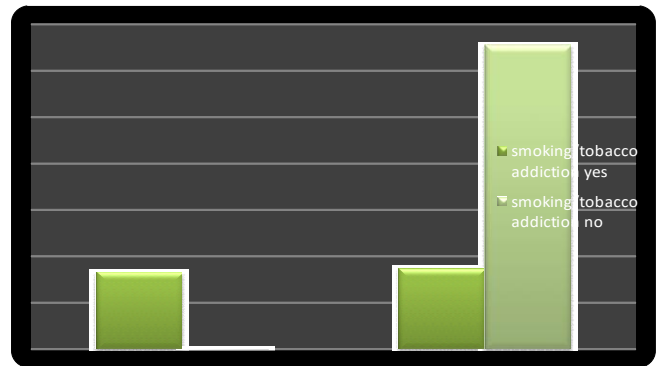


Figure I. Smoking/Tobacco Addiction & Blood Pressure

Sedentary lifestyle and hypertension were found statistically related (p-value, 0.001) [Figure II].

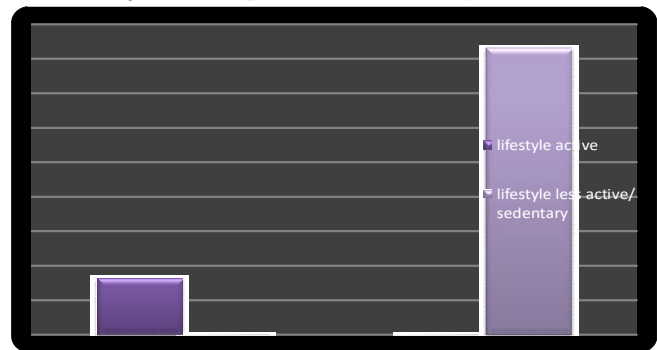


Figure II. Impact of Lifestyle on Blood Pressure

Statistically significant association was found between unhealthy diet and hypertension (p-value, 0.000) [Figure III].

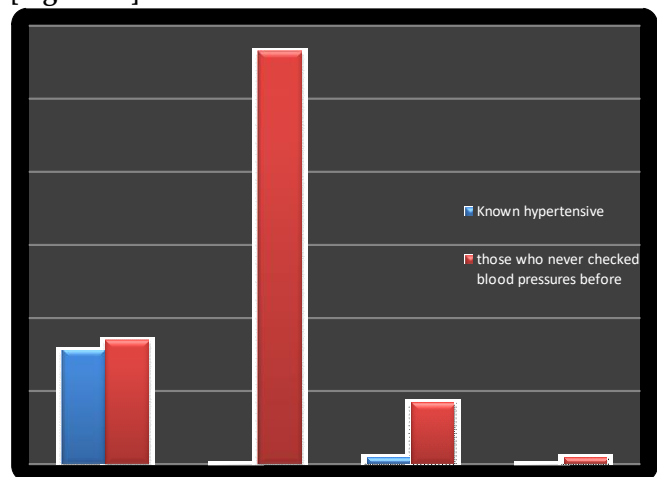


Figure III. Unhealth Diet & Hypertension

There was no significance of duration of hypertension with IHD [Table III].

Table III. IHD & Duration of Hypertension

Duration of Hypertension	Number of Patients
<1 year	28
1-5 years	04
5-10 years	01

Discussion

Our study demonstrated majority of the patients of IHD were male. Hence male gender was a risk factor for IHD as consistent with studies at Peshawar (7) and Framingham which presented males to female ratio for IHD was 2:1 (8).

According to our study, most commonly affected age group was 56-65 years. This was also evident by a study conducted in Norway (9).

Not necessarily an IHD patient had significant family history of IHD, contrary to a study conducted at Trinidad which revealed family history of IHD was related (10).

Majority of the IHD sufferers were also diabetic, hence diabetes was a significant risk factor as indicated by a study that showed those who had diabetes, 29% of them developed IHD (11). The onset of diabetes after 40 years of age increased the risk of IHD as indicated by another study which showed age at diagnosis was associated with macro-vascular complications (12), also consistent with a study depicting diabetes after 45 years of age made females more prone to IHD (7). No significant relationship was found in between family history of diabetes and development of IHD. In UAE a study showed among those with IHD, 32.4% were diabetics and 43.0% hypertensive, (13) whereas according to our study, 61.3% were diabetic while 16.6% were hypertensive.

Majority of the patients considered themselves normotensive since they never checked their pressures before that predisposed them to IHD. This reflected their knowledge, attitude and perception about the risk factors of IHD. Lack of awareness and screening for hypertension made them prone to IHD. It was also manifested by a study conducted in the USA and Spain which showed only 53% participants were aware of their being at risk for developing heart disease (14). Lack of awareness was also revealed by an Eastern Mediterranean region study, which showed that people of this region were mostly unaware of being at risk status (15).

However, many things turned out significantly positive for hypertension. Related to lifestyle, majority

of IHD patients of our research had less active/sedentary lifestyle, either due to laziness or symptoms of ischemia worsening with mobility. Hence mobility also had a significant relationship with IHD as also exhibited by another Pakistani study, which figured association between sedentary lifestyle and IHD (7), while another study figured unbalanced diet attributing IHD (16).

According to our study, diet, exercise and addiction (smoking/tobacco) were related to hypertension. Smoking/tobacco addiction increased the risk, as evident by a Chinese study (17). Duration of hypertension also increased the risk of IHD. According to a Sri Lankan study, family history of hypertension and duration of hypertension were interlinked (18) which itself was a risk factor for IHD.

Conclusion

Ischemic Heart Disease occurs more frequently in males, 56-65 years' age, with insignificant family history for IHD and diabetes. IHD is associated with hypertension and diabetes along with sedentary lifestyle, unbalanced diet and smoking/tobacco addiction. Unrecognized ongoing uncontrolled hypertension remains a silent killer. Duration of hypertension increases the risk as well. Onset of diabetes after 40 years increases the risk.

Recommendations:

Mass awareness programs through variety of media should be carried out for the control and prevention of risk factors for Hypertension, Diabetes and Ischemic Heart Disease.

Limitations:

This study was carried out in a public sector tertiary care hospital of Karachi, hence the prevalence of risk factors among private sector and other public sector hospitals left untouched, which limited the scope of our analysis.

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Conflict of interest:

There was no conflict of interest.

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