DOI: https://doi.org/10.53350/pjmhs22164833

ORIGINAL ARTICLE

Interdependence of Ischemic Heart Disease with Diabetes and Hypertension, A Clinically Comparative Study

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ABSTRACT

Aims and objectives: The aims and objectives of this study were to raise awareness among persons who have ischemic heart disease and other underlying conditions such as diabetes and hypertension.

Methodology: Total 150 individuals of age 50-60 years old were selected for this study. In control group 25 male and 25 females were selected. On the other hand, 75 male and 25 female were in Group-B. All patients of Group-B visited in Cardiology Department of MTI Lady Reading Hospital and Abbottabad International medical college Abbottabad with different cardiac complications like chest pain, high blood pressure, short breathing and sweating etc.

Results: In this study different variables were considered and compare these parameters within the group by applying $p<0.05$ significant regression test. BMI, systolic and diastolic blood pressure, oxygen saturation, intensity of chest pain, smoking habit and random serum glucose levels of both male and female were measured. A significant changes ($p<0.05$) regarding above parameters in individuals of Group-B were noted as compared with normal individuals of Group-A.

Conclusion: In conclusion, there were strong and concrete evidences that diabetes and hypertension are a major risk factors for cardiovascular complications therefore these two metabolic abnormalities were correlated with ischemic illness. There were multiple evidences that structural and biochemical cardiac abnormalities begin in the pre-diabetic state.

Keywords: systolic and diastolic blood pressure, oxygen saturation, diabetes mellitus, ischemic heart disease

INTRODUCTION

Cardiovascular diseases reached are reaching a higher number year by year in Pakistan. These deaths consist primarily of strokes and ischemic heart diseases. According to the most recent WHO statistics, coronary heart disease fatalities in Pakistan totaled 251,220 in 2018, accounting for 20.28 percent of all deaths. Ischemic heart diseases are associated mainly with diabetes and hypertension [4]. The coronary blood flow from physiological point of view adjust itself for oxygen demands in metabolic pathway of the myocardium and it was concluded that regulation of blood in the microcirculation become blocked [6].

Ischemic heart disease is narrowing of heart arteries, this narrowing of arteries causes less blood to flow in it and thus leads to high blood pressure and leads to sudden heart attack [3]. In accordance with Hypertension, diastolic and systolic blood pressure are both important their increase is risky for ischemic heart diseases many cases who reported narrowing of arteries were already suffering from high blood pressure problems and studies have shown that systolic blood pressure have major impact on causing hypertension as proved by clinical trials and thus more risk of ischemic heart diseases [1, 2]. Studies have reported diabetes inducing dyslipidemia which thus leads to formation of atherosclerosis causing ischemic heart diseases. Diabetic patients are more vulnerable to heart diseases as compared to non-diabetic patients [7].

Diabetes as shown by clinical trials is controlled by management of stress and proper intake of proper balanced diet with food causing less rise in glycemic index [9]. High blood glucose levels induce diabetes mellitus (DM), [10] is a diverse and complicated chronic metabolic illness. In cardiovascular complications diabetes mellitus is a major risk factor especially in the cases of ischemic heart disease [12]. It was seen in different studies that in diabetic patients the pathophysiology of myocardial ischemia is absolutely different and not fully clear. Different researchers described in their studies that the chances of plaques deposition in the epicardial vessels become increased in diabetic patients [13]. In diabetic patients myocardial energy state and coronary blood flow have special role in the pathophysiology of ischemic heart diseases [14].

MATERIALS AND METHODS

Study design: This is a clinical study which was conducted in medical and cardiology departments of different institutes the time duration was 6 month.

Sample size: Total 150 individuals of age 50-60 years old were selected for this study. In control group 25 male and 25 female were selected. On the other hand 75 male and 25 female were in Group-B. All individuals of Group-B come in Cardiology Department of MTI Lady Reading Hospital and Abbottabad International medical college Abbottabad with different cardiac complications like chest pain, high blood pressure, short breathing and sweating etc.

Sampling technique: BMI, systolic and diastolic blood pressure, oxygen saturation, intensity of chest pain, smoking habit and random glucose levels were measured.

Raw data collection: Raw data of all individuals of group-A and group-B were collected on proforma/ questionnaire by considering their medical history, it has seen that majority of male patients were smoker with cardiac and diabetic family history. Female were less affected towards diabetes but were suffering from systolic and diastolic blood pressure.

Data analysis: Collected raw data was bio-statistically analyzed with SPSS version 2020. The comparison between groups were considered by applying significant ($p<0.05$) test and regression analysis was operated through t- test and one way ANOVA.

RESULTS

Group-A: control, n=25, male individual's age 40-60 years

Variables	Units	Mean ±SD	p<0.05
BMI	kg/m²	20.01±03.1	0.00
Systolic BP.	mm Hg	120.2±01.03	0.00
Diastolic BP.	mm Hg	80.01±02.03	0.00
Smoking habit	Percentage	4.01±3.1	0.00
Chest pain intensity	Percentage	01.0±3.1	0.00
Oxygen saturation	Percentage	98.09±2.10	0.00
Random glucose levels	mg/ dl	130.01±03.12	0.00

Group-A: control, n=25, female individual's age 40-60 years

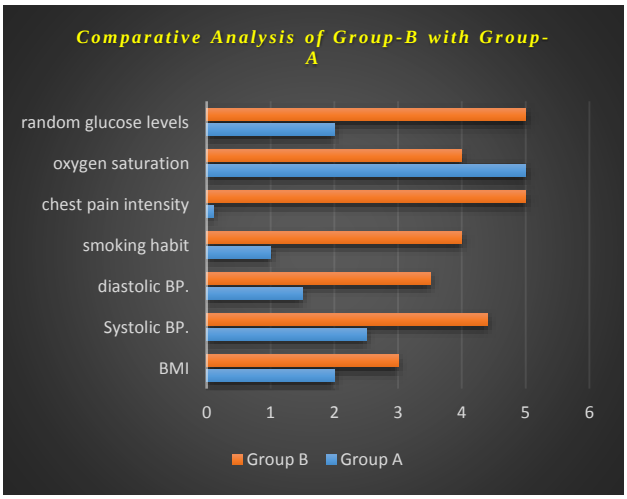
Variables	Units	Mean ±SD	p<0.05
BMI	kg/m²	22.01±03.1	0.00
Systolic BP.	mm Hg	120.2±01.03	0.00
Diastolic BP.	mm Hg	79.01±02.03	0.00
Smoking habit	Percentage	0.01±3.1	0.00
Chest pain intensity	Percentage	01.0±3.1	0.00
Oxygen saturation	Percentage	99.01±1.10	0.00
Random glucose levels	mg/ dl	132.01±03.12	0.00

Group-B: Male Ischemic heart patients n=75, age 40-60 years

Variables	Units	Mean ±SD	p<0.05
BMI	kg/m²	32.01±03.1	0.00
Systolic BP.	mm Hg	160.2±01.03	0.00
Diastolic BP.	mm Hg	90.01±02.03	0.00
Smoking habit	Percentage	67.5±3.1	0.00
Chest pain intensity	Percentage	68.10±2.1	0.00
Oxygen saturation	Percentage	94.01±1.10	0.00
Random glucose levels	mg/ dl	262.01±02.10	0.00

Group-B: Female Ischemic heart patients n=25, age 40-60 years

Variables	Units	Mean ±SD	p<0.05
BMI	kg/m²	33.01±03.1	0.00
Systolic BP.	mm Hg	165.2±01.03	0.00
Diastolic BP.	mm Hg	100.1±0.03	0.00
Smoking habit	Percentage	6.05±3.1	0.00
Chest pain intensity	Percentage	22.10±2.1	0.00
Oxygen saturation	Percentage	93.01±1.10	0.00
Random glucose levels	mg/ dl	270.01±02.10	0.00



In this study different variables were considered and compare these parameters within the group by applying p<0.05 significant regression test. BMI, systolic and diastolic blood pressure, oxygen saturation, intensity of chest pain, smoking habit and random serum glucose levels of both male and female were measured. In group-B, BMI, systolic and diastolic blood pressure, oxygen saturation, intensity of chest pain, smoking habit and random serum glucose levels of both male and female were (32.01±03.1, 160.2±01.03, 90.01±02.03, 67.5±3.1, 68.10±2.1, 94.01±1.10, 262.01±02.10),(33.01±03.1,165.2±01.03,100.1±0.03,6.05±3.1,22.10±2.1,93.01±1.10,270.01±02.10) measured respectively. A significant changes (p<0.05) regarding above parameters in individuals of Group-B were noted as compared with normal individuals of Group-A.

DISCUSSION

Fronzo et al., (1975) reported that heart failure was a complication of diabetes and hypertension, they further described that in many cases the cause of congestive heart failure was narroation of small blood vessels because of diabetes and hypertensive complications. Mills et al., (2016) positively supported the hypothesis that diabetic individuals have very poor blood glucose control and have high risk of cardiovascular complications. Different researchers stated in their findings that diabetic patients have a higher chance of developing left ventricular diastolic dysfunction [16].

In a study it was fond that rate of high cardiovascular mortality is associated with systolic and diastolic blood pressure dysfunction [17]. In another study the findings were related to ischemic heart disease in which high serum levels of glucose, abnormal systolic and diastolic blood pressure are correlated with cardiovascular complications. Jung and Choi (2014) concluded in their study that diabetes and hypertension are the risk factors of atherosclerosis which is an increasing syndrome of systolic heart failure.

Researchers stated that because of insulin resistance the levels of serum lipid profile showed a variation in their concentrations especially high levels of triglycerides and low levels of high-density lipoproteins was reported in different metabolic syndromes [19, 20]. The findings of current study were very similar to the previous studies and significant changes (p<0.05) were noted in group B as compared control group A.

Future aspects: Cardiovascular diseases are the major causes of mortality in all over the world as reported by WHO. Cardiac health awareness is needed to control rising number of patients by changing their lifestyle, and eating habits. Further research is needed to control this life threating problem.

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