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ORIGINAL ARTICLE

Consequences of Obesity Associated Factors Caused Coronary Heart Disease. A Comparative Clinical Study

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ABSTRACT:

Objective: The main objective of this study was to check clinically that Coronary Heart Disease in our local population caused by obesity.

Study design: It is a comparative clinical study.

Place and duration: Current clinical study was conducted in Lahore Medical & Dental College Lahore, Pakistan from December 2021to March 2022.

Methodology: In Group X, 25 normal individuals were selected while in Group Y, 75 patients with Coronary Heart Disease were considered respectively. Intensity of Shoulder or arm pain, Shortness of breath, lipid profile, BMI, oxygen saturation, systolic and diastolic blood pressure and electrocardiogram (ECG). Lipid profile were performed through blood sample, Oxygen saturation levels were measured through oximeter, blood pressure with sphygmomanometer. The bio-statistically model SPSS was applied for the presentation of collected raw data.

Results: Different parameters such as BMI, systolic and diastolic blood pressure, Intensity of Shoulder or arm pain, oxygen saturation, blood serum cholesterol, blood serum triglycerides, blood serum LDL, blood serum HDL levels and electrocardiogram (ECG) were measured comparatively in current study. The levels of these variables in Group-X and Group-Y were (18.02±01.02, 118.1±01.01, 72.01±0.01, 0.01±0.01, 99.0±0.03, 198.01±0.04, 138.02±0.02, 125.01±0.03, 45.01±0.01), (28.01±01.04, 178.0±01.03, 96.01±09.04, 90.01±0.02, 94.0±0.03, 268.01±0.01, 208.01±0.04, 185.01±0.01, 35.01±0.04) measured respectively.

Conclusion: In present study different parameters such as BMI, systolic and diastolic blood pressure, Intensity of Shoulder or arm pain, oxygen saturation, blood serum cholesterol, blood serum triglycerides, blood serum LDL, blood serum HDL levels and electrocardiogram (ECG) were measured in both Group-X and Group-Y and a significant (P≤0.05) changes were observed in individuals of Group-Y than the Group-X comparatively.

Keywords: Body mass index, Obesity, Coronary Artery Disease, Systolic and Diastolic Blood Pressure

INTRODUCTION

A condition in which body mass index (BMI) of any individual become higher than the normal because of body fat this phenomenon is known as obesity [10]. Obesity is not only a cosmetic concern it is an abnormal medical condition that raises the chance of various illnesses and complications, including heart disease, diabetes, high blood pressure, and some malignancies [9,17]. Gaining and maintaining excess weight can be caused by a variety of circumstances. Diet, inactivity, environmental variables, and genetics are major factors involved in this medical complication [1]. A person's predisposition to weight gain may also be influenced by his genes. According to scientists, DNA may make someone more likely to be obese, but other circumstances, like a plentiful food supply or insufficient exercise, may also be necessary for someone to be overweight. Additionally, different studies have shown that people are more overweight or obese because they get less sleep [5-10]. This is partially due to the fact that hormones generated during sleep and help to regulate appetite and utilize energy of body properly [2,8].

When the blood vessels because of some block with plaque the supply of blood become reduced than the normal required level this condition referred as Ischemia [3]. In ischemic heart disease blood cannot flow properly to the all regions of body and ultimately due to the lack of required oxygen supply individual face different complications in the biological system. The term "ischemic heart disease," or "coronary heart disease" or "coronary artery disease," are all has same meanings and refers to cardiac conditions in which blood supple decreased in the circulatory system [6]. Whenever the blood vessels become narrow in spite of plaque or blood clot the condition atherosclerosis. Heart attack, also known as myocardial infarction (MI) occurred when the blood supply to the heart muscle is entirely cut off [4].

There are three different ways through which obesity cases heart complications in first way it change the cholesterol levels there in number of studies it has seen that LDL, HDL, triglycerides and total cholesterol levels shown a remarkable changes in obese individuals than the normal one [7]. The other major side effect of obesity is changing in blood pressure of obese people due to such changes heart related diseases become activated. The third most important medical carnage in obese subjects is diabetes [8]. Diabetes is most common likely to occur in obese people. Weight gain, high fatigue, fainting, chest pain, edema, sleep lost are the common indications of ischemic heart disease while family history, obesity, high blood pressure, casual lifestyle, smoking, alcohol etc. are the risk factors [9].

Rationale of Study: In Pakistan proper health awareness is not available for population. Coronary heart disease is very common in our local population because of poverty, low literacy rate and irregular lifestyle. The aims and objectives of present study were to provide health awareness about cardiac complications to the people.

MATERIALS AND METHODS

Study design: This is a comparative clinical study and was conducted from December 2021to March 2022 in medical and cardiology departments of Lahore Medical & Dental College Lahore, Pakistan, Approval of current study was given in November 2021.

Sample size: For current study 100 male subjects of age 40-60 years old were selected. In Group X, i.e. control group, 25 normal individuals were involved while in Group Y, 75 patients with Coronary Heart Disease were considered respectively. All patients of Group Y with Coronary Heart Disease were visited at Cardiology units of different medical institutes.

Exclusion criteria: Age, gender, race, ethnicity, and the stage of the disease, the subject's prior treatment experience, and the presence or absence of any medical, psychological, or emotional disorders may all be included in inclusion and exclusion criteria.

Biomarkers: Intensity of Shoulder or arm pain, Shortness of breath, lipid profile, BMI, oxygen saturation, systolic and diastolic blood pressure and electrocardiogram (ECG).
Sampling techniques: This is a clinical study in which first line symptoms were observed at the time of patient appearance and further tests i.e., cholesterol, LDL, Triglycerides and HDL levels were measured through colorimetry kit test from collected blood sample. Oxygen saturation levels were measured through oximeter and blood pressure with sphygmomanometer.
Collection of raw data: Raw data of all subjects of Group-X and Group-Y were gathered with the help of a Performa and questionnaire for medical history. Cholesterol, LDL, Triglycerides and HDL levels, Oxygen saturation levels and systolic and diastolic blood pressure of each individual were collected and this raw data further processed through bio-statistically. The bio-statistically model SPSS was applied for the presentation of collected raw data. The significant ($p<\leq 0.05$) value and regression analysis were operated through Mean Standard and Deviation (Mean ±SD).

RESULTS

Different parameters such as BMI, systolic and diastolic blood pressure, Intensity of Shoulder or arm pain, oxygen saturation, blood serum cholesterol, blood serum triglycerides, blood serum LDL, blood serum HDL levels and electrocardiogram (ECG) were measured comparatively in current study. The levels of these variables in Group-X and Group-Y were (18.02±01.02, 118.1±01.01, 72.01±0.01, 0.01±0.01, 99.0±0.03, 198.01±0.04, 138.02±0.02, 125.01±0.03, 45.01±0.01), (28.01±01.04, 178.0±01.03, 96.01±09.04, 90.01±0.02, 94.0±0.03, 268.01±0.01, 208.01±0.04, 185.01±0.01, 35.01±0.04) measured and presented in table-1 and table-2 respectively. The demographics of present study were showed in Fig-1, Fig-2 and Fig-3 comparatively.

After combative analysis it was concluded that BMI, systolic and diastolic blood pressure, Intensity of Shoulder or arm pain, oxygen saturation, blood serum cholesterol, blood serum triglycerides, blood serum LDL, blood serum HDL levels and electrocardiogram (ECG) of individuals belong to Group-Y showed a significant($P\leq 0.05$) variation than the individuals of G-X comparatively.

Table: 1: Group-X control, n=25, age 40-60 years,

Variables	Units	Mean ±SD	p≤0.05
BMI	kg/m²	18.02±01.02	0.02
Systolic BP.	mm Hg	118.1±01.01	0.01
Diastolic BP.	mm Hg	72.01±0.01	0.01
Intensity of Shoulder or arm pain	Percentage	0.01±0.01	0.01
Oxygen saturation	Percentage	99.0±0.03	0.03
Blood Serum Cholesterol levels	mg/ dl	198.01±0.04	0.04
Blood Serum Triglyceride levels	mg/ dl	138.02±0.02	0.02
Blood Serum LDL levels	mg/ dl	125.01±0.03	0.03
Blood Serum HDL levels	mg/ dl	45.01±0.01	0.01

Table 2: Group-Y, patients with Coronary Heart Disease n=75, age 40-60 years

Variables	Units	Mean ±SD	p≤0.05
BMI	kg/m²	28.01±01.04	0.04
Systolic BP.	mm Hg	178.0±01.03	0.03
Diastolic BP.	mm Hg	96.01±0.04	0.04
Intensity of Shoulder or arm pain	Percentage	90.01±0.02	0.02
Oxygen saturation	Percentage	94.0±0.03	0.03
Blood Serum Cholesterol levels	mg/ dl	268.01±0.01	0.01
Blood Serum Triglyceride levels	mg/ dl	208.01±0.04	0.04
Blood Serum LDL levels	mg/ dl	185.01±0.01	0.01
Blood Serum HDL levels	mg/ dl	35.01±0.04	0.04

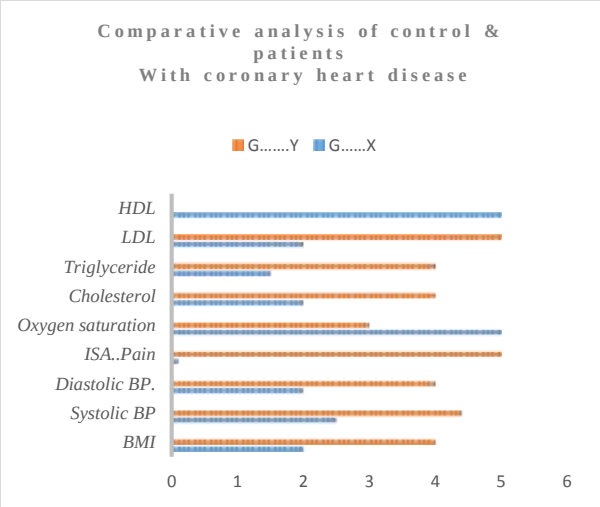

Fig-1: Comparative analysis of control & patients with coronary heart disease

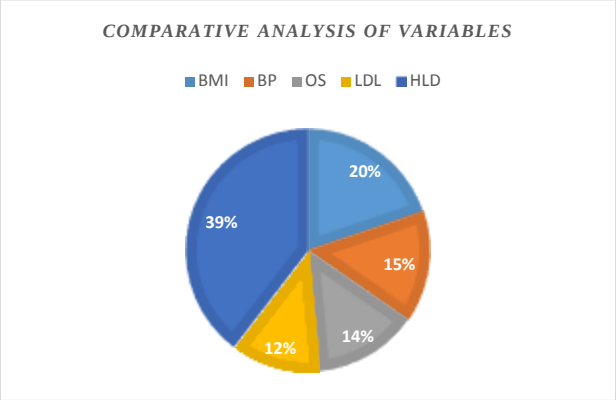

Fig-2: Comparative analysis of Variables. Percentages of Body Mass index(BMI), Blood pressure(BP), OS, LDL, HDL are shown below

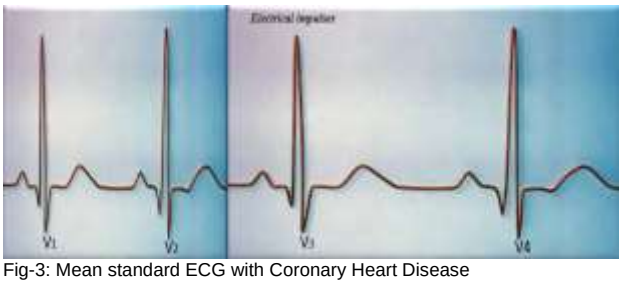

Fig-3: Mean standard ECG with Coronary Heart Disease

DISCUSSION

Different studies concluded that in obese people increase in blood pressure occurred due to the higher requirement of blood to supply oxygen and nutrients [11, 12, and 15]. In another study it was seen that for the development of coronary heart disease (CHD) Obesity is an independent risk factor [12,19]. Obesity also changes lipid profile, cholesterol levels can fluctuate in obese individuals, while most of people are aware that obesity can increase only bad cholesterol and triglyceride levels, but in many studies, it was summarized that it can also effect on HDL- cholesterol [14-18]. In a study result are presenting that HDL is very important for the removal of bad cholesterol and it also safe the biological system from cardiac complications [13,19].

Diet and exercise may not be sufficient for all people to reach a healthy weight. Bariatric surgery can be the best option for

those how have high BMI in age of 35 [9,18]. It is safe and shown to reduce or eliminate diabetes, high blood pressure, and high cholesterol in obese people. People with similar BMIs may have different metabolic and CVD risk profiles due to obesity, which is recognized as a heterogeneous disorder [10,14]. Therefore, individual disparities in regional body fat distribution, which have an adverse effect on heart structure and function, play a major role in the vulnerability to obesity-related cardiovascular problems [3-7]. Future study is required to better manage patients with obesity and CVD due to the rising incidence of obesity in communities with longer life expectancies and to assess the processes causing obesity-related heart dysfunction [7,16].

A greater number of upstream interventions are also required for the primary prevention of obesity as a chronic disease and for its improved treatment as a result of the sharp rise in the proportion of young patients with severe obesity [5]. In future for the proper control on obesity randomized controlled trials, examine lifestyle modifications to determine how purposeful weight loss and reduced visceral adiposity affect the outcomes of obesity-related CVD are required[12,17,20]. The creation of dietary interventions using extensive randomized controlled trials to pinpoint wholesome eating habits or tailored diets for lowering CVD risk in obesity are so important and development of upstream therapies for improved primary prevention of obesity as a chronic illness and treatment of the condition in young patients with severe obesity best therapy [4,19].

In present study different parameters such as BMI, systolic and diastolic blood pressure, Intensity of Shoulder or arm pain, oxygen saturation, blood serum cholesterol, blood serum triglycerides, blood serum LDL, blood serum HDL levels and electrocardiogram (ECG) were measured comparatively in both Group-X and Group-Y and a significant (P≤0.05) changes were observed in individuals of Group-Y than the Group-X comparatively [17-20]. The concluded variations of present study were also seen in different studied conducted by many researchers [12,15,19,20]. Independent of other cardiovascular risk factors, obesity increases the chance of developing cardiovascular disease and increases the mortality rate from cardiovascular disease. More current research emphasizes waist circumference measurements of abdominal obesity as a cardiovascular disease risk sign that is independent of body mass index.

CONCLUSION

In present study different parameters such as BMI, systolic and diastolic blood pressure, Intensity of Shoulder or arm pain, oxygen saturation, blood serum cholesterol, blood serum triglycerides, blood serum LDL, blood serum HDL levels and electrocardiogram (ECG) were measured in both Group-X and Group-Y and significant (P≤0.05) changes were observed in individuals of Group-Y than the Group-X comparatively.

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