

Body Mass Index with Lifetime Risks of Cardiovascular System 2018-2019

Itedal Abdelraheem Mohamed Ahmed*

Department of Anatomy, Faculty of Medicine, Najran University, Saudi Arabia

***Corresponding Author:** Itedal Abdelraheem Mohamed Ahmed, Department of Anatomy, Faculty of Medicine, Najran University, Saudi Arabia.

Received: July 18, 2019; **Published:** August 19, 2019

Abstract

This is a descriptive cross-sectional study conducted in Najran University hospital in Saudi Arabia during January 2018 - January 2019. The main aim was to identify the association of body mass index with lifetime risks of cardiovascular system. In antenatal clinic as per protocol 316 patient in different age groups and taking a detailed medical history and clinical examination. After completion of the one year data which were recorded in a questionnaire were distributed in the statistical program for analysis using descriptive frequency, crosstab. 97 (30.7%) individuals were diagnosed as cases of cardiovascular diseases (CVD). Diabetes; 20 (42.6 %) were obese categories, 15 (31.9%) were overweight categories and 12 (37.5%) were normal categories out of 47 (48.5%) individual diabetes, the 35 (74.5%) diabetes were obese. Hypertensive; 6 (37.5 %) were obese categories, 5 (31.5%) were overweight categories, 4 (25%) were normal categories, 1 (6.25%), were underweight categories out of 16 (16.5%) individual hypertensive. Heart disease; 3 (60%) were obese categories and 2 (40%) were overweight categories out of 5 (5.2%) individual heart disease. I have revealed that body fat were strongly associated with incidence risks of cardiovascular system. Importantly association between obesity and an increased risk of cardiovascular disease.

Keywords: *Obesity; Body Mass Index; Adipose Tissue; Risk of Cardiovascular; Diabetes; Hypertension and Heart Diseases*

Introduction

The cardiovascular system consists of heart and blood vessels. It provides oxygen and nutrients to tissues while removing the wastes. The heart is situated within middle mediastinum resting on the diaphragm. The wall of the heart has three layers: the endocardium, myocardium and pericardium. The heart divided into four chambers; two atria and two ventricles. Deoxygenated blood enters the right side of the heart and plumbed into the pulmonary circulation. After oxygenation in the lungs it returns in to left side of heart. The left ventricle plumbed blood out of the heart to the rest of the body.

The body mass index (BMI), or Quetelet index is a controversial statistical measurement which compares a person's weight and height. Though it does not actually measure the percentage of body fat, it is used to estimate a healthy body weight based on how tall a person. Due to its ease of measurement and calculation, it is the most widely used diagnostic tool to identify weight problems within a population, usually whether individuals are underweight, overweight or obese [1].

This previous study shows the obesity was associated with shorter longevity and significantly increased risk of cardiovascular morbidity and mortality compared with normal body mass index (BMI). Despite similar longevity compared with normal BMI, overweight was

associated with significantly increased risk of developing cardiovascular disease (CVD) at an earlier age, resulting in a greater proportion of life lived with CVD morbidity [2].

In addition studies show that wound hypertension increases the risk for a variety of cardiovascular diseases [3,4] including stroke, coronary artery disease, heart failure, atrial fibrillation [5] and peripheral vascular disease. The risk for both coronary disease and stroke increases progressively with incremental increases in blood pressure above 115/75 mmHg, as shown in numerous epidemiologic studies. However, these observations do not prove a causal relationship, since increasing blood pressure could be a marker for other risk factors such as increasing body weight, which is associated with dyslipidemia, glucose intolerance, and the metabolic syndrome. The best evidence for a causal role of increasing blood pressure in cardiovascular complications is an improvement in outcome with antihypertensive therapy [6]. The increase in cardiovascular risk has primarily been described in terms of elevated systolic pressure in those over age 60 years [7] and elevation in both systolic and diastolic pressure in younger individuals. Pulse pressure, which is the difference between the systolic and diastolic blood pressures and is determined primarily by large artery stiffness, is also a strong predictor of risk [7]. Other study demonstrated that BMI category and cardiac mortality, 6.2% of patients were underweight, 51.1% had normal weight, 28.2% were overweight and 14.6% were obese. Higher BMI values were associated with lower all-cause and cardiac mortality [8]. Obesity is an independent risk factor for cardiovascular disease (CVD) [9-13] and is associated with advanced CVD requiring procedures such as percutaneous coronary intervention (PCI), reduction in life expectancy [14] and a higher mortality rate [11,15,16]. Weight loss has been associated with improvement in preexisting cardiovascular risk factors including hypertension (HTN), diabetes, and dyslipidemia and mortality [17-20]. Other studies have reported improved clinical outcomes in overweight and obese patients treated for CVDs compared to normal weight patients, suggesting a paradoxical survival benefit. This effect has been reported in patients with diabetes [21], end-stage renal disease [22].

Materials and Methods

This is a descriptive cross-sectional study conducted at the department of medicine in the Najran University hospital in Najran City in Saudi Arabia. It was conducted during the period January 2018 to January 2019. In the antenatal clinic as per protocol 316 individuals were selected for the study. The doctor and staff nurse on duty were trained to enter the data in a Questionnaire. Anthropometric measurements taken were height, body weight, body mass index (BMI).

Then the individual patient were further examined for their detailed medical history-especially the history of family, maternal age and socioeconomic status. The electronic body scale is a high precision electronic scale for the use of computing weight (from 150 to 200 kg) and height (from 70 to 190). (BMI) is the body weight divided by the square of his or her height. The formulae universally used in medicine produce a unit of measure of weight(kg)/height² (m²) and use excel program for calculation. The BMI is used to screen persons for weight categories that may lead to health problems (Table 1) [23].

BMI	Category
< 18.5	Underweight
18.5 - 24.9	Normal weight
25 - 29.9	Overweight
30 -34.9	Obese-Class I
35 - 39.9	Obese-Class II
40 and above	Obese-Class III

Table 1: Shows body mass index is used to screen persons for weight categories.

After completion of the one year, data regarding the detailed medical history were recorded in a questionnaire and analyzed using SPSS Software.

Statistical methods

The data were analyzed using (SPSS Software) statistical social package for social sciences (Version 20 SPSS, Chicago, Illinois USA). Descriptive statistics were calculated for every measured variable, in order to evaluate the studied sample. All analyses were performed using the descriptive frequency, explore and crosstabs probabilities and a P value of $P < 0.05$ was considered statistically significant. Mendeley Software was used in reference citations in this article.

Results

Data collected from January 2018 to January 2019 from the department of Medicine in Najran University Hospital. The percent of frequencies were calculated to examine the relationship between the cardiovascular disease (CVD) and fatty body (obesity). The number of participators in this study about 316 individuals, 47 (14.9%) diabetes, 16 (5.1%) hypertensive, 5 (1.8%) and 29 (9.2%), the rest of the individuals were normal and other cases 204 (46.6%) and 15 (4.7%) that mean 97 (30.7%) out of the 316 studied individual with a lifetime risk of cardiovascular system that shows in figure 1.

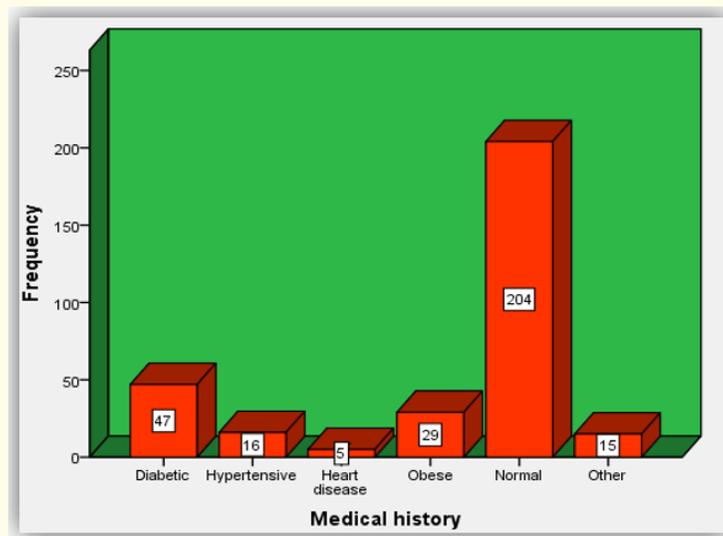


Figure 1: Descriptive frequency medical history components.

Table 2 shows the distribution frequency percentage of participators fatty body as following manner: Underweight; 13 (4.1%), Normal weight; 87 (27.5%), Overweight; 105 (33.2%), Obese 111 (35.1%) and also Figure 2 explains frequency count of fat body mass index categories.

The figure 3 displays the frequency ratio of the relationship between body mass index and a lifetime of Cardiovascular risks in this study as follows: Diabetes; 20 (42.6%) were obese categories, 15 (31.9%) were overweight categories and 12 (37.5%) were normal categories out of 47 (48.5%) individual diabetes, the 35 (74.5%) diabetes were obese. Hypertensive; 6 (37.5%) were obese categories, 5

BMI	Categories	Total frequency %
< 18.5	Underweight	13(4.1%)
18.5 - 24.9	Normal weight	87 (27.5%)
25 - 29.9	Overweight	105 (33.2%)
> 30	Obese	111 (35.1%)
Total		316 (100 %)

Table 2: Shows the distribution of body mass index categories of participants.

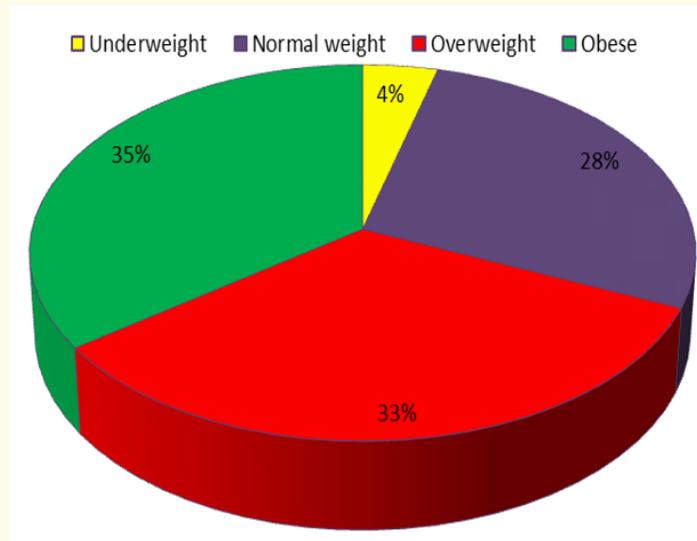


Figure 2: Shows the frequency of body mass index categories of participants.

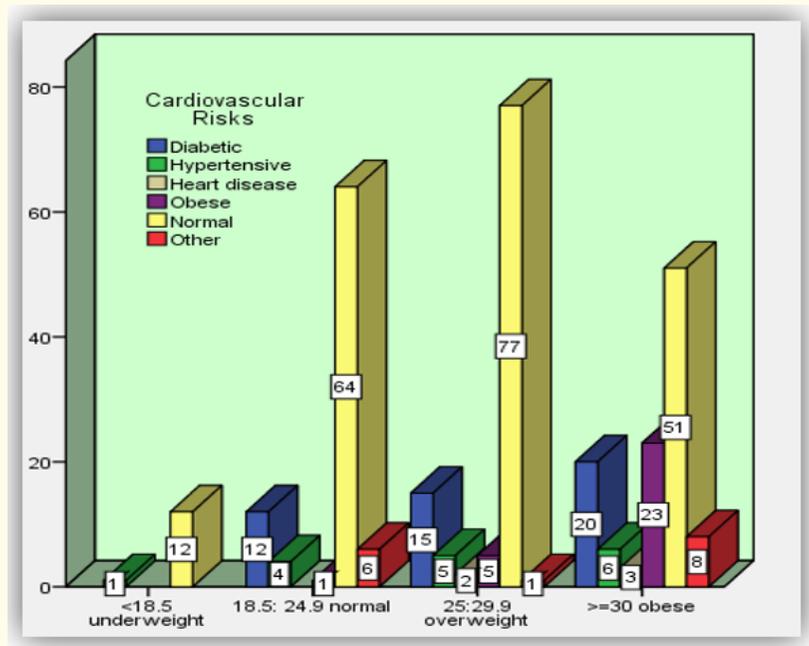


Figure 3: Explains frequency of relationship between body mass index and a lifetime of cardiovascular risks.

(31.5%) were overweight categories, 4 (25%) were normal categories, 1 (6.25%), were underweight categories out of 16 (16.5%) individual hypertensive. Heart disease; 3 (60%) were obese categories and 2 (40%) were overweight categories out of 5 (5.2%) individual heart disease.

Discussion

Obesity is a fixed risk factor in the lifetime risks of cardiovascular disease. As in previous studies, with authors who cited in this study; observed the cardiovascular disease individuals, has been associated with an increased BMI or degree of obesity. This finding establishes that increasing fatty body is strongly associated with lifetime risks of cardiovascular disease.

Another study; SS Khan., *et al.* [2] demonstrated that BMI category is strongly associated with shorter longevity and significantly increased risk of cardiovascular morbidity and mortality compared with normal body mass index (BMI). In the present study, a risk of cardiovascular disease; obesity, heart disease, hypertensive and diabetes with overweight BMI and increase the degree of obesity a proved optimal, and this result reinforced outcomes of previous studies in this field. M Brida., *et al.* [8] demonstrated that higher BMI values were associated with lower all-cause and cardiac mortality, that surly the finding in this study, the five cases heart disease were overweight and obese.

Other studies W Doehner., *et al.* [21] and K Kalantar., *et al.* [22] have reported improved clinical outcomes in overweight and obese patients treated for CVDs compared to normal weight patients, suggesting a paradoxical survival benefit. This effect has been reported in patients with diabetes and at end-stage renal disease. All these studies support this study conducted in this context not only these, but all the studies cited in this research.

Conclusion

Always the fatty body is associated with the risk of cardiovascular disease. This study confirmed the importance of the association between obesity and increased risk of cardiovascular disease.

Acknowledgements

Many thanks and appreciations go to the member of Najran University Hospitals in KSA. Many pleasures and appreciation owed to many people who contributed knowingly and indirectly to this work, thankfulness to all authors whom cited who their work in this research. Many thanks and appreciations go to everyone who encouraged and supported the ideas of this work.

Bibliography

1. G Eknoyan. "Adolphe Quetelet (1796 1874) the average man and indices of obesity". *Nephrology Dialysis Transplantation* 23.1 (2007): 47-51.
2. SS Khan., *et al.* "Association of body mass index with lifetime risk of cardiovascular disease and compression of morbidity". *JAMA Cardiology* 3.4 (2018): 280-287.
3. E Rapsomaniki., *et al.* "Blood pressure and incidence of twelve cardiovascular diseases: lifetime risks, healthy life-years lost, and age-specific associations in 1.25 million people". *Lancet* 383.9932 (2014): 1899-1911.
4. PK Whelton., *et al.* "2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines". *Hypertension* 71.6 (2018): e13-e115.
5. F Angeli., *et al.* "Hypertension, inflammation and atrial fibrillation". *Journal of Hypertension* 32.3 (2014): 480-483.

6. Blood Pressure Lowering Treatment Trialists' Collaboration, *et al.* "Blood pressure lowering and major cardiovascular events in people with and without chronic kidney disease: meta-analysis of randomised controlled trials". *British Medical Journal* 347 (2013): f5680.
7. JA Staessen, *et al.* "Risks of untreated and treated isolated systolic hypertension in the elderly: meta-analysis of outcome trials". *Lancet* 355.9207 (2000): 865-872.
8. M Brida, *et al.* "Body mass index in adult congenital heart disease". *Heart* 103.16 (2017): 1250-1257.
9. SW Rabkin, *et al.* "Relation of body weight to development of ischemic heart disease in a cohort of young North American men after a 26 year observation period: the Manitoba Study". *American Journal of Cardiology* 39.3 (1977): 452-458.
10. JE Manson, *et al.* "A Prospective Study of Obesity and Risk of Coronary Heart Disease in Women". *New England Journal of Medicine* 322.13 (1990): 882-889.
11. HB Hubert, *et al.* "Obesity as an independent risk factor for cardiovascular disease: a 26-year follow-up of participants in the Framingham Heart Study". *Circulation* 67.5 (1983): 968-977.
12. Y Chen, *et al.* "Association between body mass index and cardiovascular disease mortality in east Asians and south Asians: pooled analysis of prospective data from the Asia Cohort Consortium". *British Medical Journal* 347.1 (2013): f5446.
13. Global Burden of Metabolic Risk Factors for Chronic Diseases Collaboration (BMI Mediated Effects), *et al.* "Metabolic mediators of the effects of body-mass index, overweight, and obesity on coronary heart disease and stroke: a pooled analysis of 97 prospective cohorts with 1.8 million participants". *Lancet* 383.9921 (2014): 970-983.
14. KR Fontaine, *et al.* "Years of Life Lost Due to Obesity". *Journal of the American Medical Association* 289.2 (2003): 187.
15. EE Calle, *et al.* "Body-Mass Index and Mortality in a Prospective Cohort of U.S. Adults". *New England Journal of Medicine* 341.15 (1999): 1097-1105.
16. KM Flegal, *et al.* "Association of All-Cause Mortality With Overweight and Obesity Using Standard Body Mass Index Categories". *Journal of the American Medical Association* 309.1 (2013): 71-82.
17. CJ Lavie, *et al.* "Obesity and Cardiovascular Disease". *Journal of the American College of Cardiology* 53.21 (2009): 1925-1932.
18. CJ Lavie, *et al.* "The Obesity Paradox, Weight Loss, and Coronary Disease". *American Journal of Medicine* 122.12 (2009): 1106-1114.
19. SM Artham, *et al.* "Value of Weight Reduction in Patients with Cardiovascular Disease". *Current Treatment Options in Cardiovascular Medicine* 12.1 (2010): 21-35.
20. J Sierra-Johnson, *et al.* "Prognostic importance of weight loss in patients with coronary heart disease regardless of initial body mass index". *European Journal of Cardiovascular Prevention and Rehabilitation* 15.3 (2008): 336-340.
21. W Doehner, *et al.* "Inverse relation of body weight and weight change with mortality and morbidity in patients with type 2 diabetes and cardiovascular co-morbidity: An analysis of the PROactive study population". *International Journal of Cardiology* 162.1 (2012): 20-26.
22. K Kalantar-Zadeh, *et al.* "Mortality Prediction by Surrogates of Body Composition: An Examination of the Obesity Paradox in Hemodialysis Patients Using Composite Ranking Score Analysis". *American Journal of Epidemiology* 175.8 (2012): 793-803.
23. U.S. Preventive Services Task Force. "Screening for Obesity in Adults: Recommendations and Rationale". *Annals of Internal Medicine* 139.11 (2003): 930.

Volume 2 Issue 7 September 2019**©All rights reserved by Itedal Abdelraheem Mohamed Ahmed.**