



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.3837295>Available online at: <http://www.iajps.com>

Research Article

**PREVALENCE OF DIABETES MELLITUS AMONG OBESE  
AND NON-OBESE PATIENTS WITH CORONARY ARTERY  
DISEASE**<sup>1</sup>Dr Ifrah Amjad Mir,<sup>2</sup>Dr Hafsa Khalid,<sup>3</sup>Dr Shifa Nayyab<sup>1</sup>MBBS,Faisalabad Medical University,Faisalabad., <sup>2</sup>MBBS,Sheikh Zayed Medical College,Rahim Yar khan., <sup>3</sup>MBBS,Continental Medical College,Lahore.**Article Received:** March 2020**Accepted:** April 2020**Published:** May 2020

*Some of the established risk factors such as Hypertension, diabetes mellitus, hyperlipidemia, smoking and positive family history are common leading factors to coronary artery disease. The prevalence of coronary artery disease is more in obese patients as compared to non-obese patients . WHO has announces Global epidemic of obesity because body weight and prevalence of obesity and its complications are increasing speedily worldwide. . Almost one billion adults are overweight and at-least 30 million are obese.*

*The current study has showed that BMI has directly linked with diabetes mellitus which was found more prevalent among obese CAD population as compared to non-obese CAD patients.*

**Corresponding author:****Dr. Ifrah Amjad Mir,**  
MBBS,Faisalabad Medical University, Faisalabad.

QR code



*Please cite this article in press Ifrah Amjad Mir et al, Prevalence Of Diabetes Mellitus Among Obese And Non-Obese Patients With Coronary Artery Disease., Indo Am. J. P. Sci, 2020; 07(05).*

**INTRODUCTION:**

Some of the established risk factors such as Hypertension, diabetes mellitus, hyperlipidemia, smoking and positive family history are common leading factors to coronary artery disease. The prevalence of coronary artery disease is more in obese patients as compared to non-obese patients [1, 2]. WHO has announced Global epidemic of obesity because body weight and prevalence of obesity and its complications are increasing speedily worldwide. [3-4]. Almost one billion adults are overweight and at-least 30 million are obese.

Framington has showed the statistics that degree of obesity is proportional to the rate of development of cardiovascular diseases and that there is dramatic increase of sudden death, among those patients who are 20% overweight as compared to those with normal weight. Obesity has direct relation with inflammatory markers including C reactive protein and cytokines in normal blood circulation. [5,6] The prime source of excess cytokines and IL-6 is adipose tissue itself which in consequences triggers the production of CRP by liver. [7] The inflammatory markers are in direct relation with insulin resistance, [8] which anticipates atherosclerotic issues.

It concludes that adipose tissues are major source inflammatory cytokines and interleukins which lead to diabetes, hypertension, and atherosclerosis which are the main risk factors of coronary artery disease. The prevalence of the metabolic syndrome currently exceeds 20% of individuals  $\geq 20$  years of age and 40% of the population  $>40$  years of age. [9,10] Like obesity, the presence of the metabolic syndrome has been associated with risks of developing diabetes and cardiovascular disease. In the metabolic syndrome insulin resistance has been considered to play a central pathophysiological role [11,12].

Another study has showed that the main component of metabolic syndrome is obesity, and it has direct relation with coronary artery disease which is higher in females than males. [13] A recent study has concluded that monitoring the fat deposition from childhood could be the initiation towards the prevention of heart disease and diabetes later in life. As an obese coronary artery patients are more diabetes so there must be initial preventive measures should be account to control the epidemic of obesity. It will not minimize the risk of diabetes but it will also lower the incidence of coronary artery disease.

**MATERIAL AND METHODS:**

It was a cross sectional study. Total 220 patients were enrolled. Participants who already have diagnosed with coronary artery disease either by positive ETT or diagnosed coronary artery angiogram were recruited into the study.

Patient with acute coronary syndrome but with cardiogenic shock and patients with unstable angina and non ST elevation MI with normal previous report of either ETT or coronary angiography were excluded from the study. A written informed consent was obtained from all the participants after explaining them the purpose of study. A brief history was conducted including height, weight, hip circumference and waist circumference. Fasting and random blood sugar levels were taken. According to the current guidelines and recommendations exercise tolerance test and coronary artery angiogram was performed. According to the calculated BMI the patients were classified as obese or non-obese.

Participants were categorized either diabetic or not according to the WHO diagnostic criteria, which defines diabetes as fasting blood sugar  $>126$  mg/dl or random blood sugar  $>200$  mg/dl, with one abnormal value in symptomatic individuals or two abnormal values in asymptomatic individuals. Data analysis was performed by SPSS version 20. Continuous variables were mentioned in terms of Mean $\pm$ SD whereas categorical variables were described as frequencies or percentages. For categorical variables Chi-square test was preferred whereas for significance testing of categorical variables t test was performed. The level of significance was 5%.

**RESULTS:**

Total 220 participants were recruited into the study. Two groups were made 110 of obese whereas remaining 110 non obese. There were 76 females in obese group and 83 in non-obese group whereas 44 male in obese group and 27 male in non-obese group. The average age was same in both the groups (53 $\pm$ 9 years). The mean BMI of obese group was 28.22 $\pm$ 2.32 and in non-obese was 21.99 $\pm$ 2.38. Most of the participants were diabetic from more than 5 years of duration. The average duration of diabetes of obese group was 76 $\pm$ 62 whereas of non-obese the average Mean $\pm$ SD was 74 $\pm$ 57. It was observed that prevalence of diabetes was increased with the increase of body mass index. Obese patients were found diabetic as compared to non-obese. Obese participants were having poor diabetic control as compared to non-obese. Similarly the diabetic related complications were more prevalent among obese group.

**DISCUSSION:**

46% of cardiac deaths occur due to myocardial infarction in Pakistan. Prevention is the major key towards the diseased participants. Due to the marked increase in the obesity the prevalence of diabetes has been increased by 20% in United States. Some important factors of type 2 diabetes which must be controlled are BMI, fat distribution and weight gain.

The current study has revealed that the prevalence of diabetes increases with the increase of BMI in both genders. It correlates with another study which has given the statistics about both genders, the prevalence of hypertension, diabetes, and hypercholesterolemia was directly proportional to BMI. [14, 15] In this study the coronary artery disease was more prevalent among obese male as compared to obese female. The results are similar to another study conducted in 2015 which states that the prevalence of CAD is more in male as compared to females. [16,17]

A study conducted in Brazil has showed the results of trial the mean age was 62 years.[18] In this study age group of 41–60 years was more common in both obese (70%) and nonobese (57%) CAD patients, followed by age above 60 years in both groups, i.e., in obese (18%) and in nonobese (27%), with no statistical difference. The age group 41–60 years was also the most common group in a study done on 813 CAD admitted patients from July 2004 to June 2005 in the same cardiology unit. [19]

Framingham heart study concludes that the incidence of IHD increases with the increase in age [20]

Most of the patients in our study had diabetes for more than 5 years of duration. Similar results were seen in previous studies conducted in the population of Spain.[21] In current study, total 44% patients were diabetic. Out of these, 63.31% were obese while 39.36% were non-obese, with significant statistical differences ( $p=0.004$ ). The similar results obtained in large study by Frederique Thomas et al, who also reported similar results. When compared with subjects with BMI  $<25$  KG/m<sup>2</sup> without associated risk factors, overweight subjects did not have an increased risk of cardiovascular mortality. Another study shown the results that 72.6% of 3,275 diabetic patients were obese.[22,23] Data from NHANES III indicated that two-thirds of adult men and women in the United States diagnosed with type 2 diabetes have a BMI of 27 Kg/m<sup>2</sup> or greater. Moreover, the risk of diabetes increased in a linear relationship with BMI; diabetes prevalence was 2%, 8%, and 13% in those

with BMI 25 to 29.9 Kg/m<sup>2</sup> (overweight), 30 to 34.9 Kg/m<sup>2</sup> (class I obesity), and 35 Kg/m<sup>2</sup> (class II/III obesity), respectively. [24] Weight gain and increase in BMI during adulthood also increase the risk of diabetes, even at relatively low levels of BMI in initially normal-weight individuals. [25, 26]

Obesity has been major risk factor of cardiovascular disease (CVD). In all developed countries diabetes has significantly prevalent among obese people. The obese population would have cardiovascular disease some time later in their life which has direct burden on their off-springs. So better preventive step should be taken to get control over the disease and lower the incidence towards population to avoid further complications

**CONCLUSION:**

The current study has showed that BMI has directly linked with diabetes mellitus which was found more prevalent among obese CAD population as compared to non-obese CAD patients.

**REFERENCES:**

1. Abbas S, Abbas S, Riaz A, Malik N. Risk factors for CAD in Pakistan. *Pak Armed Forces Med J* 2003;53:12–9.
2. Thomas F, Bean K, Pannier B, Oppert JM, Guize L, Benetos A. Cardiovascular mortality in overweight subjects. The key role of associated risk factors. *Hypertension* 2005;46:654–5.
3. Zahid A. General aspects of human obesity. *J Pak Med Assoc* 2003;53:564.
4. World Health Organization. WHO world wide health report: Reducing risks promoting healthy life. Geneva: World Health organization; 2002. viii.
5. World Health Organization. WHO Reports 2004, WHO global NCD infobase [Online] 2004 [Cited on August 13, 2006]. Available from: [http://www.who.int/ncd\\_surveillance/infobase](http://www.who.int/ncd_surveillance/infobase)
6. Dawber TR. The Framingham study: the epidemiology of Atherosclerotic disease. Cambridge: Harvard University press; 1980.
7. Liuzzo G, Biasucci LM, Gallimore JR, Grillo RL, Rebuzzi AG, Pepys MB, et al. The prognostic value of C-reactive protein and serum amyloid a protein in severe unstable angina. *N Engl J Med* 1994;331:417–24.
8. Danesh J, Collins R, Appleby P, Peto R. Association of fibrinogen, C-reactive protein, albumin, or leukocyte count with coronary heart disease: meta-analyses of prospective studies. *JAMA* 1998;279:1477–82.

9. Mohamed-Ali V, Goodrick S, Rawesh A, Katz DR, Miles JM, Yudkin JS, et al. Subcutaneous adipose tissue releases interleukin6, but not tumor necrosis factor-alpha, in vivo. *J Clin Endocrinol Metab* 1997;82:4196-4200.
10. Esposito K, Pontillo A, Ciotola M, Di Palo C, Grella E, Nicoletti G, et al. Weight loss reduces interleukin-18 levels in obese women. *J Clin Endocrinol Metab* 2002;87:3864-6.
11. Heinrich PC, Castell JV, Andus T. Interleukin-6 and the acute phase response. *Biochem J* 1990;265:621-36.
12. McLaughlin T, Abbasi F, Lamendola C, Liang L, Reaven G, Schaaf P, et al. Differentiation between obesity and insulin resistance in the association with C-reactive protein. *Circulation* 2002;106:2908-12.
13. Festa A, D'Agostino R Jr, Howard G, Mykkanen L, Tracy RP, Haffner SM. Chronic subclinical inflammation as part of the insulin resistance syndrome: the Insulin Resistance Atherosclerosis Study (IRAS). *Circulation* 2000;102:42-7.
14. Kuller LH, Tracy RP, Shaten J, Meilahn EN. Relation of C-reactive protein and coronary heart disease in the MRFIT nested case-control study. Multiple Risk Factor Intervention Trial. *Am J Epidemiol* 1996;144:537-47.
15. Ridker PM, Hennekens CH, Buring JE, Rifai N. C-reactive protein and other markers of inflammation in the prediction of cardiovascular disease in women. *N Engl J Med* 2000;342:836-43.
16. Wise BC. The inflammatory syndrome: The role of adipose tissue cytokine in metabolic disorders linked to obesity. *J Am Soc Nephrol* 2004;15:2792-800.
17. Laaksonen DE, Lakka HM, Niskanen LK. Metabolic syndrome and development of diabetes mellitus: application and validation of recently suggested definitions of the metabolic syndrome in a prospective cohort study. *Am J Epidemiol* 2002;156:1070-7.
18. Hanley AJ, Karter AJ, Festa A. Factor analysis of metabolic syndrome using directly measured insulin sensitivity: the insulin resistance atherosclerosis study. *Diabetes* 2002;51:2642-7.
19. Sjostrom CD, Peltonen M, Sjostrom L. Blood pressure and pulse pressure during long term weight loss in obese: the Swedish obese subjects (SOS) Intervention study. *Obese Res* 2001;9:188-95.
20. Basit A, Hakeem R, Hydrie MZ, Ahmedani MY, Masood Q. Fitness, lipid, insulin sensitivity, life style of children from high low risk families. *J Ayub Med Coll* 2003;15:6-9
21. Nishtar S. Prevention of coronary artery diseases in South Asia. *Lancet* 2002;360:1015-8.
22. Harris MI, Flegal KM, Cowie CC. Prevalence of diabetes, impaired fasting glucose and impaired glucose tolerance in US adults. The Third National Health and Nutrition Examination Survey, 1988-1994. *Diabetes Care* 1988;21:518-23.
22. Hanson L. Primary prevention of coronary heart disease: what is left to be done? *Medicographia* 1998;20:183-6.
23. Aziz-ur-Rahman, Sattar A, Abaidullah S, Hassan M. Evaluation of cardiovascular risk factors in patient with essential hypertension. *Ann KE Med Coll* 1999;5:134-7.
24. Ishaq M, Beg MS, Ansari SA, Hakeem A, Ali S. Coronary artery disease risk profiles at a specialized tertiary care centre in Pakistan. *Pak J Cardiol* 2003;14:61-8.
25. Maggioni AP, Franzosi MG, Santoro E. The risk of stroke in patients with acute myocardial infarction after thrombolytic therapy and anti thrombotic treatment: Gruppo Italiano per lo studio della Superavvivenza nell 'Infarcto Micocardico II (GISSI2) and the international study group. *N Eng J Med* 1992;327:1-6.
26. Kuulasmaa K, Kunstall-pedoe H, Dobson A, Fortmann S, Sans S, Tolonen H, et al. Estimation of contribution of changes in classic risk factors to trends in coronary-event rates across the WHO MONICA project population. *Lancet* 2000;355:675-87.