



OBESITY; PREVALENCE OF VARIOUS RISK FACTORS OF HEART DISEASES IN OBESE PERSONS

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ABSTRACT... Objectives: To find out the prevalence of risk factors of heart diseases in obese patients. **Study Design:** Descriptive cross-sectional study. **Setting:** OPD of Independent University Hospital, Faisalabad. **Period:** One week duration extending from 4th to 10th May 2015. **Patients and Methods:** 90 Patients were selected by convenient sampling. A semi-structured questionnaire was used to collect the information from the sample. An informed consent was also obtained from the respondents under study and the secrecy of information was ensured. **Results:** Of the 90 patients under study, 33 (36.26%) were Grade 1 Obese, 51 (56.04%) were Grade 2 Obese, and 7 (7.69%) were Grade 3 Obese. Among the patients 73.62% were non-smokers, 2.19% were former-smokers and 23.07% were smokers. Of the patients 15.38% were non-diabetic, 12.08% had Insulin Dependent Diabetes Mellitus, 7.69% had Impaired Glucose Tolerance and 63.73% had Non-Insulin Dependent Diabetes Mellitus. Only 2 people of the 91 who underwent the study were Alcoholics. Of them 1 had Grade 1 Obesity and the other had Grade 3 Obesity. 35.16% of the patients were non-hypertensive, 49.45% had Grade 1 Hypertension, 5.49% had Grade 2 Hypertension and 5.49% had Grade 3 Hypertension. 26.37% patients had a sedentary life style while 53.84% had moderate and 18.68% had intense physical activity. 70.32% patients had a high fat intake while 28.57% had a low fat intake. Heart diseases were present in the fathers of 30.76% of patients, mothers of 13.18% patients and were present in both father and mother of 7.69% patients. **Conclusion:** No significant trend in the increase in BMI and increased prevalence of cardiovascular risk factors was observed, however the incidence of some risk factors like diabetes and high fat intake was somehow in direct relation with obesity.

Key words: Heart Diseases, Risk Factors, Obesity, BMI, Hypertension, Diabetes, Dietary Intake.

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INTRODUCTION

Obesity is a state of being grossly fat or overweight. World Health Organization termed the BMI between 25.00 and 30.00 as being overweight and above 30.00 as obesity.¹

Actually it is an abnormal growth of the adipose tissues due to enlargement of fat cell size (hypertrophic obesity) or an increase in the cell numbers (hyper plastic obesity) or a combination of both.²³

Obesity is a major public health concern because it is associated with an increased risk of various diseases, like type 2 diabetes, hypertension and high cholesterol levels, all of which are risk factors

for cardiovascular diseases. Obesity is also a risk factor for some other diseases like osteoarthritis, sleep apnea and certain cancers.² The most common cause of obesity is a combination of lack of physical activity, excessive food calories intake, genetic susceptibility, psychiatric illness, endocrine disorders and certain drugs. The main treatments of obesity are dieting and exercising. The quality of diet can be improved by reducing the intake of energy dense foods, such as foods high in sugars and fat, and by increasing the dietary fiber intake. Along with a suitable diet, anti-obesity drugs can be taken, which reduce the appetite or reduce the fat absorption. If dieting, exercising and anti-obesity medication fails, other treatment options are, a gastric balloon or

surgery to reduce the stomach volume, or the length reduction of the gut.^{3,4}

Obesity was rare in the early historical period, but it effected a large population in the early modern period as the prosperity increased.⁵ Obesity was formally recognized by the World Health Organization as a global epidemic in 1997.⁶ As of 2008, according to the WHO estimate at least 500million adults are obese worldwide, with higher rates among women.⁷ The rate of Obesity also increases by the fifth and sixth decade of life.⁸ The rates of obesity are rising worldwide and both developed and developing countries are being effected.⁹ The sub-Saharan Africa is the only remaining region of the Worlds where obesity is not common.²

Among all European countries, obesity is most prevalent in the United Kingdom, effecting 22-24% people during 2008-2009.^{10,11} The United States of America has the 2nd highest obesity rate among the developed countries.¹² As of 2007, 33% men and 36% women were obese.¹³ The rates were as high as 50% among the women of African-American descent.¹⁴ In China, the rates of obesity increased to 27.3% in 2004.¹⁵ In India, 5% of the total population is morbidly obese.¹⁶ Pakistan is ranked 165th in a list of world's fattest countries, published by Forbes, with 22.2% of its population over 15 years of age being obese.¹⁷ In Pakistan, people residing in bigger cities have higher rates of obesity as compared to their rural counterparts.¹⁸

In a study Nunes, Minicucci et al¹⁹ observed that 67% of the patients with increased waist circumference experienced complications including angina. In an observational cohort study Wu, Chou et al²⁰ found that being grade 2 or 3 obese was a significant indicators of mortality. Kozak, Daviglius et al²¹ concluded that being overweight or obese is adversely associated with self-reported physical health-related quality of life (HRQoL), but not mental health-related quality of life (HRQoL), 20 years later. In another study Labounty, Gomez et al²² found that among the referred patients, the individuals with increased

BMI have a greater prevalence, extent and severity of coronary artery disease.

Objectives

To find the prevalence of risk factors of cardiovascular diseases in obese people.

Materials and Methods

Study Design

Descriptive Cross Sectional Study

Setting

People attending OPD at Independent University Hospital Faisalabad

Duration of Study

One week (4th to 10th May 2015)

Sampling Technique

Convenient Sampling

Sample Size

90 Individuals

Data Collection Instruments

- A Structured Questionnaire
- Sphygmomanometer
- Glucometer

Data Collecting Procedure

The investigators themselves collected the information from the sample under study. First of all, an informed consent was taken from the respondents under study and secrecy of the information was ensured.

Data Analysis Procedure

Data was analyzed using CoStat computer package (Version 6.303, PMB 320, Monterey, CA, 93940 USA)

RESULTS AND DISCUSSION

The obese patients in the study were stratified into those with Grade 1 Obesity (BMI 25-29.9 Kg/m²), Grade 2 Obesity (BMI 30-39.9 Kg/m²) and Grade 3 Obesity (BMI ≥40 Kg/m²). Of those, 33 (36.26%) were Grade 1 Obese, 51 (56.04%) were Grade 2 Obese, and 7 (7.69%) were Grade 3 Obese. No significant trend in the increase in BMI

and increased prevalence of cardiovascular risk factors was found.

Smoking and BMI

As shown in the table-I among the patients 73.62% were non-smokers, 2.19% were former-smokers and 23.07% were smokers. Of the non-smokers 32.3% were Grade 1 Obese, 62.6% were Grade 2 Obese and 5.9% were Grade 3 Obese. Of the former-smokers all were Grade 2 Obese. Of the Smokers 52.3% were Grade 1 Obese, 33.3% were Grade 2 Obese and 14.2% were Grade 3 Obese.

Diabetes and BMI

As shown in the table-I among the patients 15.38% were non-diabetic, 12.08% had Insulin Dependent Diabetes Mellitus, 7.69% had Impaired Glucose Tolerance and 63.73% had Non-Insulin Dependent Diabetes Mellitus. Of the non-diabetics 28.5% were Grade 1 Obese, 57.1% were Grade 2 Obese and 14.2% were Grade 3 Obese. Of those who had IDDM 45.4% had Grade 1 Obesity, 45.4% had Grade 2 Obesity and 9.1% had Grade 3 Obesity. Of those with Impaired Glucose Tolerance 57.1% had Grade 1 Obesity, 42.8% had Grade 2 Obesity while none was Grade 3 Obese. Of those with NIDDM 32.7% had Grade 1 Obesity, 60.3% had Grade 2 Obesity and 6.8% had Grade 3 Obesity.

Alcohol and BMI

As shown in the table-I only 2 people of the 91 who underwent the study were Alcoholics. Of them 1 had Grade 1 Obesity and the other had Grade 3 Obesity.

Hypertension and BMI

As shown in the table-I 35.16% of the patients were non-hypertensive, 49.45% had Grade 1 Hypertension, 5.49% had Grade 2 Hypertension and 5.49% had Grade 3 Hypertension. Of the non-hypertensive patients 46.8% were Grade 1 Obese, 53.15% were Grade 2 Obese, while none was Grade 3 Obese. Of those with Grade 1 Hypertension 37.7% were Grade 1 Obese, 62.2% were Grade 2 Obese and none was Grade 3 Obese. Of those with Grade 2 Hypertension none was Grade 1 Obese, 60% were Grade 2 Obese

and 40% were Grade 3 Obese. Of those with Grade 3 Hypertension none was Grade 1 Obese while 44.4% were Grade 2 and 55.5% were Grade 3 Obese.

Physical activity and BMI

As shown in the table-I 26.37% patients had a sedentary life style while 53.84% had moderate and 18.68% had intense physical activity. Of those with a sedentary life style, 12.5% were Grade 1 Obese, 62.5% were Grade 2 Obese and 25% were Grade 3 Obese. Of those with moderate physical activity, 32.6% were Grade 1 Obese, 65.3% were Grade 2 Obese and 2.04% were Grade 3 Obese. Of those who did intense physical activity, 76.4% had Grade 1 Obesity, 23.5% had Grade 2 Obesity and none had Grade 3 Obesity.

Dietary Habits and BMI

As shown in the table-I 70.32% patients had a high fat intake while 28.57% had a low fat intake. Of those with a high fat intake 21.8% were Grade 1 Obese, 70.3% were Grade 2 Obese and 7.8% were Grade 3 Obese. Of those with a low fat intake 69.2% were Grade 1 Obese, 23.07% were Grade 2 Obese and 7.6% were grade 3 Obese.

Family History and BMI

As shown in the table-I heart diseases were present in the fathers of 30.76% of patients, mothers of 13.18% patients and were present in both father and mother of 7.69% patients. 47.25% patients have no family history of heart disease. Of those whose father had heart disease, 25% were Grade 1 Obese, 60.7% were Grade 2 Obese and 14.2% were Grade 3 Obese. Of those whose mother had heart disease, 33.3% were Grade 1 Obese, 58.3% were Grade 2 Obese and 8.3% were Grade 3 Obese. Of those with both parents having a heart disease 28.5% were Grade 1 Obese, 42.8% were Grade 2 Obese and 28.5% were Grade 3 Obese. Of those with no family history of heart disease 44.2% were Grade 1 Obese, 55.8% were Grade 2 Obese and none were Grade 3 Obese.

CONCLUSION

No significant trends of the risk factors for heart diseases were seen among the obese patients,

Variables	Sub Factors	Grade 1 (25-29.9 Kg/m ²)	Grade 2 (30-39.9 Kg/m ²)	Grade 3 (≥40 Kg/m ²)	P-value
Smoking	Non-Smoker ¹	21 (31.3%)	42 (62.6%)	4 (5.9%)	0.13
	Former-Smoker ²	0 (0%)	2 (100%)	0 (0%)	
	Smoker ³	11 (52.3%)	7 (33.3%)	3 (14.2%)	
Diabetes	Non-Diabetic	4 (28.5%)	8 (57.1%)	2 (14.2%)	0.065
	IDDM ⁴	5 (45.4%)	5 (45.4%)	1 (9.1%)	
	Impaired ⁵	4 (57.1%)	3 (42.8%)	0 (0%)	
	NIDDM ⁶	19 (32.7%)	35 (60.3%)	4 (6.8%)	
Alcohol Intake	Yes	0 (0%)	1 (50%)	1 (50%)	0.15
	No	32 (36.3%)	50 (56.8%)	6 (6.8%)	
Hypertension	Non-Hypertensive	15 (46.8%)	16 (53.1%)	0 (0%)	0.19
	Grade 1 ⁷	17 (37.7%)	28 (62.2%)	0 (0%)	
	Grade 2 ⁸	0 (0%)	3 (60%)	2 (40%)	
	Grade 3 ⁹	0 (0%)	4 (50%)	5 (50%)	
Physical Activity	Low	3 (12.5%)	15 (62.5%)	6 (25%)	0.39
	Moderate	16 (32.6%)	32 (65.3%)	1 (2.04%)	
	Intense	13 (76.4%)	4 (23.5%)	0 (0%)	
Dietary Habits	High Fat Diet	14 (21.8%)	45 (70.3%)	5 (7.8%)	0.44
	Low Fat Diet	18 (69.2%)	6 (23.07%)	2 (7.6%)	
Family History	Father +	7 (25%)	17 (60.7%)	4 (14.2%)	0.12
	Mother +	4 (33.3%)	7 (58.3%)	1 (8.3%)	
	Both +	2 (28.5%)	3 (42.8%)	2 (28.5%)	
	Both -	19 (44.2%)	24 (55.8%)	0 (0%)	

Table-I. Prevalence of Various Risk Factors of Heart Disease in Obese People

but the prevalence of risk factors was more in obese patients as compared to non-obese patients. Intake of high fat diet and sedentary life style was found to be in a direct relation with obesity while other factors like smoking status were totally unrelated. When investigated, the prevalence of heart diseases was somehow related to the level of obesity in the patients.

Recommendations

The most important thing in combating obesity is to create awareness in the general population through health education about the causes and adverse effects of obesity and the methods and need to prevent it. People should be encouraged to adapt a healthy life style by doing exercise regularly and discouraging the intake of fast foods and other processed foods as they are a main cause of such rapid incline in the current rates of obesity. The people who are already obese should be actively treated by anti-obesity medication or by surgical interventions and

should be advised to do regular exercise and reduce their caloric intake. The people with such jobs with an increased risk of getting obese, like bank workers or doctors should also be made aware about them being at a higher risk of obesity and should be encouraged to spare some time for regular exercise and take less caloric fibrous containing diet & avoid taking food in between the meals

¹Non-Smoker = Adults who have never smoked a cigarette.

²Former Smoker = Adults who have smoked at least 100 cigarettes in their lifetime, but say they currently don't smoke.

³Smoker = Adults who have smoked 100 cigarettes in their lifetime and currently smoke cigarettes daily or nondaily.

⁴IDDM = Insulin Dependent Diabetes Mellitus

⁵Impaired = Impaired Insulin Tolerance

⁶NIDDM = Non-Insulin Dependent Diabetes Mellitus

⁷Grade 1 = 140-159/90-99 (mm Hg)

⁸Grade 2 = 160-179/100-109 (mm Hg)

⁹Grade 3 = $\geq 180/\geq 110$ (mm Hg)

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“If the plan doesn't work,
Change the plan. Never the goal. ”

Unknown



AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. Muhammad Arif Ali	Supervision, Review, Analysis, Reserach	<i>M Arif Ali</i>
2	Faran Nasir	Data collection, Review, Proof Reading	<i>Faran Nasir</i>