

Co-Morbidities and Characteristics of Adult Obese patients for Bariatric Surgery (Sleeve Gastrectomy) and their early Postoperative Complications

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ABSTRACT

Background: Obesity is defined as an increase in body weight that is greater than 20 percent of an individual's ideal body weight; the weight is determined by certain factors, such as age, height, and gender. Obesity has become a real and serious health issue in the world. Obesity doesn't come alone but associates with many other multiple diseases like type 2 diabetes mellitus (T2DM), hypertension (HTN) and many more. Sleeve gastrectomy is very beneficial as the surgical treatment of obesity but it also has some risks or complications. Complications may be early or could be long term.

Aim: To determine comorbidities and characteristics of adult obese patients for bariatric surgery (Sleeve Gastrectomy) and their early postoperative complications

Method: Data of 55 participants was taken age ranging from 18 to 60 years from record room of General Operation Theatre (GOT) department of Shalamar Hospital, Lahore. Other than age, weight and BMI of the participants, their comorbidities and complications were studied.

Result: Average age of participants which was 41.345 years with standard deviation of 8.097. Most patients were in category of 40 to 50 years age. There were 27 females and 28 males included in this study. 94.5% of the participants had limited physical work ability. Most common co-morbidity was arthritis (53%) then came snoring and hypertension (45% each) followed by sleep apnea (40%) and respiratory disease (36.4%), diabetes (34.5%), regurgitation (32.7%) and myocardial infarction at last with 7% frequency. Rate of post-operative complications was very low with 5.5% of bleeding and 3.6% of abscess and stomach leak both.

Conclusion: This study concluded that co-morbidities increase with increasing weight and older age in a dose-response relationship. Also, respiratory disease and sleep apnea are more significant than other co-morbidities. Co-morbidities can be controlled with changing social structure and lifestyles. The problem can only get worse with time if not addressed by healthcare planners.

Keywords: obesity, co-morbidity, post-operative complications

INTRODUCTION

Obesity has become a real and serious health issue in the world. Unhealthy diet and lack of physical activities are the main causes. The ongoing nutrition transition is characterized by persistent under-nutrition and micronutrient deficiencies, and the emerging problem of over-nutrition. The most important and main reason for obesity is not adopting healthy lifestyle and having unhealthy diet. Not only adults, but children are also being affected by unhealthy lifestyle. Globally, obesity has been increasing every day.

World Health Organization estimates that globally there 1.6 billion persons that were overweight in 2005. Among them at least 400 million adults whose age was 15 years or above were obese¹. Prevalence of obesity has been increasing in Pakistan too by every year. Pakistan is not only facing the challenge of overweight but also underweight population. These health issues are affecting our lives in many ways. According to the recent survey of WHO in 2016, it has been up to 8.6% in Pakistan. It is more common in female as comparative to males with almost 11.3% and 6% ratio respectively^{2,3}.

Many diseases are associated with obesity for example; gout, sleep apnea, hypertension (HTN), osteoarthritis, stroke, type 2 diabetes mellitus (T2DM), cardiovascular diseases, gall bladder disease, dyslipidemia and many others^{4,5}. In past years, obesity was considered to be treated by changing the lifestyle and eating habits but now, with the advancement of every field including medical, there are surgical options to treat obesity in less time such as Bariatric surgery in which almost 70 to 80% part of your stomach is removed. Shortening the size of your stomach restricts the amount of consuming food^{6,7,8}. In addition, procedure elicits hormonal changes that lead to weight loss.

The objective of the study was to determine the comorbidities and characteristics of adult obese patients came for bariatric surgery (Sleeve Gastrectomy) and to look upon their early post-operative complications.

MATERIALS AND METHODS

The study design of this research is Retrospective. This study was carried out at General Surgery Department of Shalamar Hospital, Lahore after permission from Ethical Review Committee. This study was conducted for 6 months (January 2021 to June 2021). As it was a retrospective study, so the sample size was time based. A study proforma was used as a study instrument which included all the factors (co-morbidities and characteristics) and also their post-operative complications.

Subjects who had laparoscopic sleeve gastrectomy surgery aged between 18 years to 60 years and irrespective of gender were recruited in this study. Subjects having a provisional surgery (Sleeve Gastrectomy) were excluded from the study. The data was collected and analyzed by SPSS 20.0 version. Frequencies were calculated for qualitative data (such as gender, comorbidities and post-operative complications) whereas mean and standard deviation was computed for quantitative variables (such as age, weight, height and BMI). Chi square test was used for analysis. 5% level of significance was used all statistical tests.

RESULTS

A total of 55 participants (27 males and 28 females) were recruited in this study with age ranging from 18 years to 60 years. Mean age \pm Standard Deviation of participants was 41.345 \pm 8.097. Mean weight of the participants was 131.45kg and mean height was 167.85.13 total factors were studied in this research out of which 9 were comorbidities and 4 out of 13 were post-operative

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complications. P value of less than 0.05 was taken as significant.

The average age of participants was 41.345 years. Most patients were in category of 40 to 50 years age⁹. There were 27 females which makes almost 49% of the total and 28 (51% of the total) were males. Mean weight range was between 100 and 190 with an average of 131.45 kg. Height of participants was measured in centimeter and it lied in between 160 and 180cm with a mean height of 167.85cm and standard deviation of 4.348. BMI of the participants was ranging between 35 and 65 with an average of 46.56 kg/m and standard deviation was 4.565.

Table 1: Factors and responses of obese patients

Factors	Responses	Frequencies	%age
Snoring	Yes	25	45
	No	30	55
Regurgitation	Yes	18	32.7
	No	37	67.3

Table 2: frequency and percentage of comorbidities

Factors	Responses	Frequencies	Percentage
Limited physical work	Yes	52	94.5
	No	3	5.5
Arthritis	Yes	29	53
	No	26	47
Hypertension	Yes	25	45
	No	30	55
Sleep apnea	Yes	22	40
	No	33	60
Respiratory disease	Yes	20	36.4
	No	35	63.6
Diabetes	Yes	19	34.5
	No	36	65.5
Myocardial infarction	Yes	4	7
	No	51	93

Table 4.3 and 4.4 shows total factors and their responses. As shown above, there were 13 factors and co-morbidities in total which were observed in this study other than age, weight and BMI among which 9 were co-morbidities. Their responses and frequencies are mentioned in the table above from highest to lowest ratio respectively. As shown above, limited physical work was most co-morbidity factor followed by arthritis, hypertension and snoring, sleep apnea, respiratory disease, regurgitation, diabetes and myocardial infarction.

Table 3: Comparison of gender with comorbidities

Co-morbidities	Frequency	Male	Female	Significance 2 sided
Limited physicalwork	52(94.5%)	27	25	0.531
Arthritis	29(52.7%)	16	13	0.504
Snoring	25(45.54%)	15	10	0.701
Hypertension	25(45.45%)	14	11	0.694
Sleep apnea	22(40%)	12	10	0.509
Respiratorydisease	20(36.36%)	11	9	0.864
Diabetes	19(34.54%)	11	8	0.452
Regurgitation	18(32.7%)	9	9	0.925
Myocardialinfarction	4(7.2%)	3	1	0.317

This table tells the frequency of responses with the gender relation. Almost 94.5% (52 participants) reported the absence of moderate to vigorous physical activity with 25 females and 27 males, out of which most of the participants lied in the age group of 40 to 50 years.

Most common co-morbidity among the participants was arthritis which was among 53% of the participants among which 13 were females and 16 were males, age group 40 to 50 was significant here too ¹⁰. The two most common co-morbidities after arthritis were snoring and hypertension having equal number and percentage, 25 participants with percentage of 45. 13 females and 12 males were hypertensive. 11 females and 14 males out of 25 were snoring. Following common co-morbidity was sleep apnea

which was present in 22(40%) participants (12 females and 10 males) followed by respiratory disease which was present in 20 participants which makes almost 3.6% of the total participants among which 11 were males and 9 were females.

Other co-morbidities were diabetes which was present in 19 participants (8 females and 11 males), followed by regurgitation in 18 (almost 32.7% of total) participants out of which 9 were females and 9 were males and myocardial infarction was present in 4 patients (7% of total participants) among which 1 was female and 3 were males.

Table 4: comparison of comorbidities with age groups

Co-morbidities	Age (years)				Significance (2-sided)
	<30	30-40	40-50	>50	
Snoring	2	13	5	5	0.455
Sleep Apnea	0	14	4	4	0.047
Diabetes	2	7	6	4	0.834
Hypertensions	1	10	9	5	0.734
MyocardialInfarction	0	2	1	1	0.916
RespiratoryDisease	0	14	3	3	0.018
Regurgitation	1	9	6	2	0.767
Limitedphysicalactivity	4	23	15	10	0.532
Arthritis	3	10	9	7	0.366

This table is showing co-morbidities and its relation with age groups. As we can see, most common co-morbidity age group was 30-40 years. The reason of this result could be that most of the participants were in this age group. Respirator disease and sleep apnea stood significant in this relation.

Table 5: Frequency of complications of sleeve gastrectomy

Complications	Frequency	Percentage
Post-op Bleeding	3	5.5
Abscess	2	3.6
Stomach Leak	2	3.6
Wound Infection	No	No

This table is showing the frequency of complications. Post op bleeding was most common with frequency of only 3 participants which makes 5.5% of the total. Then came abscess and stomach leak with frequency of 2 participants each which made 3.6% of total.

DISCUSSION

Morbid obesity has become a serious health problem globally¹². Resulting increase in co-morbidity and mortality have been studied in a number of studies. In addition to lifestyle changes and many medical interventions, bariatric surgery has been widely spread as a treatment of morbid obesity. It has excellent effects of reducing mortality, decreasing co-morbidities and reducing socioeconomic costs. However, with such excellent results, some complications also come with bariatric surgery.

A total of 13 factors were studied in this research among which 9 were co-morbidities and 4 out of 13 were early post-operative complications. It was seen that the highest rate co-morbidity was limited physical work followed by arthritis and then snoring, hypertension and sleep apnea. 52 out of 55 had limited physical work problem. Limited physical work was so justified as obesity rarely allows patient to move and do routine wise work as a non-obese person. Obesity is directly associated with hyperuricemia and gouty arthritis (Magliano, 2008)¹².

Results of this mentioned study and our study were alike. Adipose tissue (fat tissue) produces cytokines proteins that cause inflammation in and around joints causing arthritis. Arthritis was more dominant in males as compared to females. Obese people are more likely to be snoring as most of the obese persons have narrow airway due to large size of tonsils or adenoids. Same like arthritis, snoring was seen a little more dominant in males than in females. Equal to snoring, another co-morbidity i.e., hypertension, stood with equal number of cases which was 25 cases out of 55 among which 14 were males and 11 were females. Hypertension is very much common among obese persons due to maintenance of high

arterial pressure and activation of renin-angiotensin-aldosterone system (Rahmouni, Correia, Haynes, & Mark, 2005)¹³. Results of my research and the mentioned results were almost similar.

After these two, sleep apnea was present in 22 participants, which was more common in females than in males. After sleep apnea, stood respiratory disease with 20 cases in total and dominant in males with 11 cases and 9 cases were of females. Sleep apnea and respiratory disease occurs commonly among obese persons as obesity causes mechanical compression of diaphragm, lungs and chest cavity. The following co-morbidity after respiratory disease was regurgitation having equal number of cases in males and females with a total of 18 cases. Regurgitation or GERD (Gastroesophageal reflux disease) in obese patients may happen due to increase of belly fat pressure on stomach¹⁴.

The least common co-morbidity was myocardial infarction which was found to be rare having 4 cases in total out of 55 participants with 3 males and 1 female. Among all these co-morbidities only sleep apnea and respiratory disorder were significant in age groups. All these co-morbidities were more common in 40 to 50 years of age group than in younger age group. The reason of this could be aging changes in the body. Co-morbidities have been seen significantly in participants with higher BMI and higher age¹⁵.

CONCLUSION

Conclusion based on the study result is that co-morbidities increase with increasing weight and older age in a dose-response relationship. Also, respiratory disease and sleep apnea are more significant than other co-morbidities. Co-morbidities can be controlled with changing social structure and lifestyles. The problem can only get worse with time if not addressed by healthcare planners.

The common co-morbidities and factors identified here may be more generalizable to the Pakistani population as a whole because of the design and methodology of the study in comparison with previously published studies.

Conflict of interest: Nil

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