Comparative study of outcomes in Coronary Artery by Pass Grafting (CABG) in obese versus non obese patients

BISMA AKBAR, ZAHID HUSSAIN SHAH, FARRUKH GHIAS, ANAM NASEER, MAHAM BABUR

ABSTRACT

Background: Coronary artery bypass grafting improves coronary blood flow to the heart in severe coronary heart disease. According to most of studies, in spite of co –morbidity illnesses often present along with obesity, an obese body mass index was not found as an independent predictor of morbidity or mortality after Coronary artery bypass grafting (CABG).

Aim: To compare outcomes (complications) after Coronary artery bypass grafting (CABG) in obese and non obese patients during their hospital stay.

Methods: Study was conducted at Punjab Institute of Cardiology Lahore, Cardiology and Medical units of Mayo hospital Lahore and Gulab Devi Hospital Lahore. This study was conducted from March 2015 to March 2016. Non-probability sampling technique was used to collect the data and entered on specified proforma. Sample size was 200 CABG patients. SPSS 16 was used for the data analysis. The qualitative data variables like Gender, BMI etc were presented in form of tables along with its percentage. Quantitative data were presented in form of mean ±S.D.

Results: In this study the patients mean age was 52±10.10years. There were 185(92.50%) male and 30 (15%) female patients. There were 65(32.5%) normal weight patients, 36(18%) overweight and 110(55.5%) obese patients. For CPB time the mean was 1.11±3.958 hours, ranging from 180 minutes with minimum to 45 minutes and maximum 250 minutes. For Cross Clamp time, mean was determined as 50.41±3.07, the range was 100 minutes with minimum of 15 minutes and maximum of 99 minutes. The mean duration of ventilator support was observed as 8.89±6.11 hours; the range was 41 hours with minimum of 2 hours and maximum of 46 hours. Mean duration of ICU stay was determined as 8.99±3.99 days; the range was 25 days with minimum duration of 3 days and maximum for 29 days. Sternal wound infection was found in 12(6%) patients.

Conclusion: In outcomes of CABG, mean for ventilator support was8.89±6.11 hours; mean for ICU stay was 8.99±3.99 days. 12 patients got sternal wound infection, 22 patients have atrial fibrillation, 15 patients have stroke.

Keywords: CABG, obese, ventilator, BMI

INTRODUCTION

Coronary heart disease is a chronic disease with stable and unstable phases. Excessive and prolonged smoking, increased ApoB/ApoA1 ratio, hypertension, diabetes mellitus, abdominal obesity, psychosocial factors, regular alcohol consumption and low physical activity were significantly related to myocardial infarction.

In Pakistan coronary artery disease (CAD) is the 2nd leading cause of death at all age groups contributing to 13% of all causes deaths. Coronary artery bypass grafting (CABG) was introduced in 1968 and has showed superior survival and much better quality of life in some subgroups of patients having coronary artery disease as compared to medical therapy.

Obesity leads to excess body fat has accumulation to that extent that it may cause an adverse effect on patient health, leading to reduced life expectancy and increased morbidity. Body mass index (BMI), which measures weight and height, defines as overweight (pre-obese) when BMI is between 25 kg/m2 and 30 kg/m2, and an obese person when it is > than 30 kg/m2. Excessive dietary calories, physical inactivity, and high genetic susceptibility predispose to obesity although some cases are caused by genes, various endocrine disorders, medications, psychiatric illness.

The impact of obesity on the coronary heart disease still remains disputed inspite of well established association between both. Obesity is usually considered as a risk factor for perioperative morbidity and mortality with CABG and other surgery. Other factors as hypertension, hypercholesterolemia, and diabetes may also likely contribute to complications or outcomes.
Some literature did not find imbalance between obese and non-obese patients in the contribution of the severity of coronary artery disease.\textsuperscript{11,12,13} The objective of the study was to compare CABG effectiveness in obese and non-obese patients and to observe complications after CABG in obese and non-obese patients.

**MATERIAL and METHODS**

This was a prospective analytical study. This study was conducted at Punjab Institute of Cardiology Lahore, Cardiology department and Medical units of Mayo Hospital Lahore as well as Gulab Devi Hospital Lahore from March 2015 to March 2016. Non-probability sampling technique for collection of data. Sample size was 200 CABG patients.

**Inclusion Criteria:**
1. All patients of IHD
2. Myocardial infarction and Angina Pectoris patients.
3. Patients undergoing on-pump surgery
4. Patients of CABG.

**Exclusion Criteria:**
1. Diabetes Mellitus patients
2. Valvular heart disease patients and ASD & VSD patients.
3. Patients undergoing other cardiac procedures.
4. Patients with chronic kidney disease.

**METHODS**

This study of 200 CABG patients was conducted at Punjab Institute of Cardiology Lahore, Cardiology department and Medical units of Mayo Hospital Lahore as well as Gulab Devi Hospital Lahore. The duration of study was from March 2015 to March 2016. Patients were followed up after surgery. There were two groups of patients for study, obese and non-obese.

**Data analysis:** Sample size was 200 CABG patients. SPSS16 was used for the data analysis. The qualitative data variables like Gender, BMI etc were presented in form of chart (Simple, Multiple, Pie) and a table along with its percentage. Quantitative data were presented in form of mean ± S.D.

**RESULTS**

In this study the patients mean age was 52±10.10 years. There were 185(92.50%) male and 30(15%) female patients. There were 65(32.5%) normal weight patients, 36(18%) overweight and 110(55.5%) obese patients. For CPB time the mean was 1.11±3.958 hours, ranging from 180 minutes with minimum to 45 minutes and maximum 250 minutes. For Cross Clamp time, mean was determined as 50.41±3.07 hours, the range was 100 minutes with minimum of 15 minutes and maximum of 99 minutes. The mean duration of ventilator support was observed as 8.89±6.11 hours; the range was 41 hours with minimum of 2 hours and maximum of 46 hours. Mean duration of ICU stay was determined as 8.99±3.99 days; the range was 25 days with minimum duration of 3 days and maximum for 29 days. Sternal wound infection was found in 12(6%) patients. Atrial fibrillation was observed in 22(11%) patients. Stroke was found in 15(7.5%) patients. Mean pre-op haemoglobin (Hb) was detected as 15.32±1.23G/dl and post-op Hb was found 11.55±1.22G/dl. Mean pre operative prothrombin time (PT) was 12.44±1.76 seconds and post-op was found 11.45±2.14seconds. Mean pre operative activated partial thromboplastin time APTT was 30.2±8.1seconds and post op was 31.2±5.99 seconds. Mean pre-op international normalized ratio INR was detected 1.06±0.13 and post-op was 1.22±0.17. Mean pre-op urea was calculated 30.10±8.99mmol/l and post operative was 30.49±1.01mmol/l. Mean pre-op creatinine was 0.66±0.36mg/dl and post-op was detected 1.03±0.30mg/dl. Mean pre operative alkaline phosphatase ALP was 69.66±2.03 IU/L and post-op ALP was 51.20±1.77 IU/L. Mean pre-op alanine aminotransferase ALT was 31.81±1.99IU/L and post-op was 32.55±1.11IU/L.

| Table1: Descriptive Statistics of Cardiopulmonary bypass time |
|------------------|-----------------|--------|------|------|
| Mean | St deviation | Range | Min | Max |
| 1.11 | 3.958 | 180 | 45 | 250 |

| Table 2: Descriptive Statistics of Duration of Ventilator Support |
|------------------|-----------------|--------|------|------|
| Mean | St. deviation | Range | Min | Max |
| 8.89 | 6.11 | 41 | 2 | 46 |

| Table 3: Descriptive Statistics of Duration of ICU Stay |
|------------------|-----------------|--------|------|------|
| Mean | St. Deviation | Range | Min | Max |
| 8.99 | 3.99 | 25 | 3 | 29 |

Table no4#4Descriptive statistics of risk factors

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>130(65%)</td>
<td>80(40%)</td>
</tr>
<tr>
<td>Smoking</td>
<td>67(33.5%)</td>
<td>150(75%)</td>
</tr>
<tr>
<td>Family history</td>
<td>55(27.5%)</td>
<td>160(80%)</td>
</tr>
<tr>
<td>Liver disease</td>
<td>15(7.5%)</td>
<td>192(96%)</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Except sternal wound infection, the thought that obesity predisposes to various postoperative complications with CABG is not well proved by these studies.\textsuperscript{14,15}
Survival and serious complications like perioperative MI, severe sternal wound infection, kidney failure, stroke, highly prolonged mechanical ventilation, acute pneumonia and symptomatic atrial arrhythmias were analyzed. There was no significant difference between obese and non-obese patients.16,17

Patients with obesity are not at a higher risk for early and late mortality after CABG as compared to patients who are not overweight18,19.

The patients who were markedly obese were more likely to suffer from prolonged mechanical ventilation and post-operative in hospital stays as compared to non-obese patients20,21.

Except mild sternal wound infection, temporary impairment of kidney function, and slightly prolonged in hospital admission, obesity was not found increase the risk of other adverse complications/outcomes during the first year follow up of CABG patients22,23,24,25.

CONCLUSION

For our study purpose, patients had been divided into obese, overweight and normal weight groups.26,27 Out of 200 patients 110 were obese, 36 were overweight and 54 were normal weight.28,29

130 patients were hypertensive, 67 were smokers, 55 patients had family history of cardiac disease.30,31

In outcomes of CABG, mean for ventilator support was 8.89±6.11 hours; mean for ICU stay was 8.99±3.99 days. 12 patients got sternal wound support was 8.89±6.11 hours; mean for ICU stay was 8.99±3.99 days. 12 patients got sternal wound infection, temporary kidney failure, stroke, highly prolonged mechanical ventilation after coronary artery bypass grafting, severe sternal wound infection and symptomatic atrial fibrillation, 15 patients have atrial fibrillation.

REFERENCES


Comparative study of outcomes in CABG in obese versus non obese patients.


