



The "Obesity Paradox" in the postoperative period of heart surgery

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Background

Obesity is a major growing health problem across the world. According to WHO data, 13% of the world population over 18 years of age are obese¹. Numerous studies have demonstrated a relationship between obesity and cardiovascular disease, these patients comprise an **increasing proportion of the cardiac surgery population**². To implement the best care strategies, assessment about the postoperative prognostic, like as length of stay in an intensive care unit (ICU) is very important to the perioperative professionals' team^{3,4}.

Research Question

Does preoperative obesity of patients who underwent cardiac surgery are related to a major length of stay in ICU postoperatively?

Objective

The aim of this study is to determine the association between preoperative obesity and length of stay in heart surgery patients.

Methodology

This is a **retrospective observational study**. Patient cohort were collected on Mendeley Data⁵ and was performed by patients hospitalized, >18 y of age, had elective cardiac surgery, and information about BMI status, general data, Baseline demographic, nutritional, and medical history data for each enrolled patient were collected in patients of a Medical Research Center.

Data Analysis

To statistical analysis, Categorical variables are presented as counts and percentages and compared between groups using the X² test. Continuous variables are presented as means with SD/ranges. Regression analysis was performed to explore the significant predictors of ICU length of stay. All statistical analyses were performed using STATA version 17. Analyses correlating the type of surgery performed and the complication were performed in obese and non-obese patients. P value was determine by chi-square, unless * was determine by ANOVA.

Results

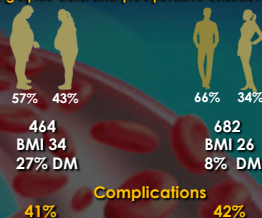
1146 eligible patients were analyzed and cardiac surgery included coronary artery bypass graft (CABG), valve surgery, or combined CABG and valve surgery in 532 (46%), 494 (43%), and 120 (10%) patients, respectively (Table 1).

Differences between groups with and without Obesity were stratified by age, gender, primary diagnosis, BMI, Diabetes, type of surgery and presence of any postoperative complications and compare in which kind of surgery.

Table 1 – Baseline characteristics of study population

Characteristics	Obesity (BMI ≥ 30) (n=464)	No Obesity (BMI < 30) (n=682)	Total (n=1146)	P value
Age, Mean (SD)	60.1 (5.9)	57.9 (5.10)	59.9 (5.9)	0.50*
Gender				
Male n(%)	263 (57%)	449 (66%)	712 (62%)	
Female n(%)	201 (43%)	233 (34%)	434 (38%)	<0.003
BMI, kg/m ²	34 (1.9, 35)	26 (1.9, 33)	28.94 (1.5, 33)	
Diabetes				
No n(%)	338 (73%)	630 (92%)	968 (84%)	
Yes n(%)	126 (27%)	52 (8%)	178 (16%)	<0.001
Primary diagnosis				
Coronary artery disease	257 (56%)	295 (43%)	552 (48%)	
Mitral disease	46 (10%)	135 (20%)	181 (16%)	
Mitral regurgitation	34 (7%)	92 (13%)	126 (11%)	<0.001*
Aortic disease	95 (20%)	96 (14%)	191 (17%)	
Aortic regurgitation	23 (5%)	48 (7%)	72 (6%)	
Tricuspid regurgitation	9 (2%)	19 (3%)	28 (2%)	
Pathology of pulmonary artery	0 (0%)	1 (1%)	1 (1%)	
Surgery				
Coronary artery bypass	340 (52%)	284 (42%)	624 (54%)	
valve surgery	184 (39%)	330 (48%)	514 (45%)	<0.001*
combined surgery	52 (12%)	68 (10%)	120 (11%)	
Postoperative Complications				
No n(%)	275 (59%)	384 (56%)	659 (58%)	
Yes n(%)	189 (41%)	298 (42%)	477 (42%)	0.61

Demographic data and preoperative characteristics



Conclusion

Obesity was not a predictive factor for a longer length of stay in the intensive care unit. The length of stay in the postoperative period of heart surgery is related with kind of surgery and complications as bleeding. Obese patients seems to have a fast recovery related to **Obesity Paradox**.

Implications for Perioperative Nursing Practice

Obesity is an important risk factor for cardiovascular disease and every day a greater number of obese patients are submitted to undergo cardiovascular surgery.

The results of this study subside research about obesity paradox and can stimulate future studies on the **preoperative nutritional approach to patients who undergo surgical procedures** and the investigation of its benefits for a postoperative recovery with a better prognosis.

References



AORN App



In adjusted analysis with confounders: age, gender, diabetes, Post-complications (bleeding, arrhythmia, bradycardia) we found some **variables associated with predict the outcome, as Postoperative complications and Bleeding (p < 0.001).**

As a result, obesity was not associated with a major length of stay in ICU after heart surgery even though the considering of obesity involves an increased risk for the development of cardiovascular abnormalities. Corroborating with these findings, other researchers describe this phenomenon as the **"Obesity Paradox"** and this has been observed in the case of several cardiovascular diseases, including acute and chronic heart failure, coronary artery disease, acute heart attack, myocardium, hypertension, and atrial fibrillation⁴, and, **correlated this to a protective effect** 1,2,4,7,6,8.

"Obesity Paradox", a subject that has not yet been fully clarified, but some studies claim that is related to a greater energy reserve, a larger vessel caliber, consequently better tissue oxygenation, and lower postoperative complications^{4,5,8}, and this study can support this discussion.

In this way is important consider the **preoperative nutritional approach to patients who undergo surgical procedures.**