Is Weight-Loss Surgery Safe for the Elderly? In-Hospital Perioperative Outcomes of Elderly Patients Undergoing Bariatric Surgery

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Background

- Weight-loss surgery is the most effective treatment for obesity and obesity-related comorbidities.
- Although the Centers for Disease control estimate 42.8% adults older than 60 are considered obese, elderly individuals are often denied weight-loss surgery due to conceived increased surgical risk and reduced long-term health benefits.
- Identifying effective treatments for obesity and obesity-related comorbidities is crucial to improve health in this vulnerable population.
- Research to help clinicians determine whether bariatric surgery is safe for specific patient populations is crucial to maximize the benefits of bariatric surgery

Study Objective

The objective of this study is to the Nationwide Inpatient Sample (NIS) database to determine the prevalence of morbid obesity and bariatric surgery in elderly patients, describe postoperative complications in these patients, and identify any modifiable risk factors

Patients

- Patients undergoing weight-loss surgery between 2016 and 2018 were identified from the NIS database
- Elderly patients defined as age ≥ 70
- A total of 99675 patients were included in the analysis, 1361 (1.37%) considered elderly

*All statistical analyses completed with SPSS v27.0 (IBM Corp; Armonk, NY; 2020

Methods

Outcome Variable

A composite adverse event variable was created combining in-hospital mortality and post-operative complications

Variables of Interest

- Obesity-related comorbidities
  - Nonalcoholic fatty liver disease (NAFLD)
  - Diabetes mellitus (DM)
  - Hypertension (HTN
  - Dyslipidemia (HLD)
  - Atrial fibrillation/flutter (AF)
  - Obstructive sleep apnea (OSA)
  - Congestive heart failure (CHF)
- Components of adverse event compositive variable
  - Died during hospitalization
  - Complications
    - Complications due to bariatric surgery
    - Postoperative nausea/vomiting
    - Cardiovascular and thromboembolic events
    - Bleeding
    - Acute kidney injury
    - Urinary tract infection
    - Pneumonia
    - Sespsis
    - Other infections
    - Anastomotic leak

Statistical Analyses*

- Differences between elderly and non-elderly patient characteristics were examined via Rao-Scott F modified chi-square tests of Wald's F tests
- Multivariable logistic regression was used to investigate risk factors for in-hospital adverse events following bariatric surgery with covariates chosen based upon forward selection

Results

Patient Demographics and In-Hospital Adverse Events

Characteristics	All	Younger Adults (< 70 yrs.)	Older Adults (≥ 70 yrs.)	p [b, c]
N (%) [a]	99675 (100)	98314 (98.63)	1361 (1.37)	
Age (mean±SD)	***	***	***	
Sex [d]				<.0001
Male	20134 (20.2)	19696 (20.03)	438 (32.18)	
Female	79513 (79.77)	78590 (79.94)	923 (67.82)	
Missing	28 (0.03)	28 (0.03)	0 (0)	
Race				<.0001
Missing	3160 (3.17)	3113 (3.17)	47 (3.45)	
White	60375 (60.57)	59242 (60.26)	1133 (83.25)	
Black	17390 (17.45)	17318 (17.61)	72 (5.29)	
Hispanic	14044 (14.09)	13974 (14.21)	70 (5.14)	
Other	4706 (4.72)	4667 (4.75)	39 (2.87)	
Procedure Type				0.0005
Roux-en-y Gastric Bypass	26804 (26.89)	26498 (26.95)	306 (22.48)	
Sleeve Gastrectomy	72871 (73.11)	71816 (73.05)	1055 (77.52)	
Comorbidities [N (%)]				
Nonalcoholic Fatty Liver Disease (NAFLD)	11395 (11.43)	11250 (11.44)	145 (10.65)	0.3889
Hypertension	52745 (52.92)	51596 (52.48)	1149 (84.42)	<.0001
Dyslipidemia	23690 (23.77)	23083 (23.48)	607 (44.6)	<.0001
Sleep Apnea	36381 (36.5)	35696 (36.31)	685 (50.33)	<.0001
Diabetes Mellitus	25991 (26.08)	25417 (25.85)	574 (42.17)	<.0001
Atrial fibrillation/flutter	2033 (2.04)	1839 (1.87)	194 (14.25)	<.0001
Congestive heart failure	1576 (1.58)	1487 (1.51)	89 (6.54)	<.0001
In-Hospital Adverse Event	***	***2458 (2.5)	***68 (5.0)	**<0.001**
Died during Hospitalization [d]	27 (0.03)	23 (0.02)	4 (0.29)	<.0001
Complications				
Complications Due to Bariatric Surgery	699 (0.7)	695 (0.71)	4 (0.29)	0.0684
Postoperative Nausea/Emesis	311 (0.31)	309 (0.31)	2 (0.15)	0.2847
Cardiovascular and Thromboembolic (MI/CVA)	239 (0.24)	229 (0.23)	10 (0.73)	0.0002
Bleeding	333 (0.33)	331 (0.34)	2 (0.15)	0.2275
Acute Kidney Injury	711 (0.71)	672 (0.68)	39 (2.87)	<.0001
Urinary Tract Infection	178 (0.18)	174 (0.18)	4 (0.29)	0.3104
Pneumonia	427 (0.43)	414 (0.42)	13 (0.96)	0.0051
Sepsis	115 (0.12)	112 (0.11)	3 (0.22)	0.2477
Other Infections	9 (0.01)	9 (0.01)	0 (0)	NA
Anastomotic Leak	80 (0.08)	80 (0.08)	0 (0)	NA

Multivariable Analysis

Risk Factors [a]	Multivariate LR [c]	
	Odds Ratio (95% CI)	p [d]
NIS Survey Year		0.0066
2016	- ref -	
2017	0.86 (0.75-0.99)	
2018	0.78 (0.67-0.92)	
Procedure Type		<.0001
Roux-en-y Gastric Bypass	- ref -	
Sleeve Gastrectomy	0.42 (0.39-0.47)	
Age at Admission		0.0786
< 70 yrs.	- ref -	
≥ 70 yrs.	1.27 (0.97-1.65)	
Sex		0.0073
Male	- ref -	
Female	0.87 (0.78-0.96)	
Race		<.0001
White	- ref -	
Black	1.31 (1.16-1.48)	
Hispanic	0.89 (0.77-1.04)	
Other	1.04 (0.85-1.27)	
Comorbidities		
Hypertension	1.2 (1.09-1.33)	0.0003
Dyslipidemia	1.15 (1.04-1.26)	0.0062
Sleep Apnea	1.21 (1.11-1.33)	<.0001
Diabetes Mellitus	1.17 (1.07-1.28)	0.0006
Atrial fibrillation/flutter	2.49 (2.06-3.02)	<.0001
Congestive heart failure	2.37 (1.95-2.89)	<.0001

- Elderly patients were more likely to have obesity-related comorbidities compared to their younger counterparts
- In-hospital adverse event rate was higher for elderly patients (5.0% vs 2.5%, p<0.001)
- In univariate analyses (data not shown), age ≥ 70 was a risk factor for in-hospital adverse events (OR 2.14, 95% CI 1.66-2.76)
- However, after accounting for all risk factors including obesti-related comorbidities, the associated risk of in-hospital adverse events in elderly patients decreased (OR 1.27, 95% CI 0.97-1.65)

Conclusions

- In the immediate postoperative period, elderly patients undergoing weight-loss surgery were at an elevated risk of adverse events
- This is mostly related to the increased prevalence of associated comorbidities in the elderly population
- Our study suggests that mitigation of risk in weight-loss surgery in the elderly can be achieved through selection of patients without an excessive burden of comorbidities