

## Perioperative and Critical Care Management of Morbidly Obese Patients

*Abdelrahman Hassan Abdelrahman; fawzy Abbas Badwy; Hamza Aboalm Mahmoud and Ahmed Abdou Ahmed.*

*Department of anesthesia & intensive care, Sohag University, Egypt*

### Abstract

AIM: The aim of this work is to know the pathophysiological mechanism of critically ill obese patients and to recognize the new requirements for their management in the critical-care-setting.

The obese patient's category is still increasing in many westernized countries especially the united states (USA). As a result, the peri-operative management of obese patients became routine care.

As obese patients are now liable for all types of procedures, it is essential and very important for all anesthesiologists, surgeons, perioperative -health care providers to understand their different multi-organ physiology so as to safely prepare those obese patients perioperatively.

A good assessment of those patients pre-operatively can decrease the risk of post-operative complications later on ..., in this manuscript, we mention the major considerations for the preoperative assessment of morbidly obese patients. Obesity now became the main cause of increased morbidity and mortality because of acute and chronic medical diseases, like diabetes mellitus, hypertension, cardiovascular problems, renal disorders, arthritis, and certain types of cancer (Mokdad et al. 2003). Obese patients, particularly morbidly ones, have a higher percentage of resource utilization, intensive care unit entrance, respiratory diseases, and respiratory distress syndrome, than do non-obese patients (Westerly and Dabbagh2011). also, obese patients are at higher danger for postoperative complications

**Keywords:** bariatric surgery, intensive care unit and obese patients, pathophysiological changes, obesity and body system response,

### Introduction

The major Basic ailment is the primary driver of horribleness and mortality around the globe. (1)

it is related to noteworthy social, physical, and practical diminishing, debilitation that can prompt diminished personal satisfaction, the monetary pressure, and mental battles for patients as well as for their families. (2)

Corpulent patients, exceptionally sullenly ones, have a higher level of asset use, emergency unit, affirmation respiratory infections, and respiratory

Stoutness currently turned into the primary driver of expanding both dreariness and mortality as a result of intense and perpetual restorative infections, like diabetes mellitus, hypertension, cardiovascular issues, renal disarranges, joint inflammation, and specific kinds of malignant growth. (3)

trouble disorder than do non-fat patients. (4)

likewise, fat patients are at higher threat for postoperative hazards and inconveniences. (5)

Heftiness is known as a weight list (BMI; summed as weight in kilograms isolated by tallness in meters squared) more noteworthy than 30) class I... 30-34.9) .... (class II... 35-39.9); extraordinary or grim stoutness is a BMI of 40 or more prominent (class III...  $\geq 40$ ). (6)

This paper discloses to us more data about the pathophysiological changes of fundamentally sick hefty patients and the likelihood of how to oversee them perioperatively and in the emergency unit).

The system followed in doing this audit is as per the following:

1. Locales to be visited: Google, Medline, Bar drug and hurray.
2. Scans for distributed information from 2000, through June 2019.
3. Search terms incorporating dismal heftiness in basic consideration unit.
4. Lists of sources of articles are looked for significant articles.
5. Survey articles and paper explanations that are scanned for and suggestions demonstrated and reported into general rules.
6. full-content investigations and English language studies will be liked.
7. Explores configuration: randomized clinical preliminaries, non-randomized preliminaries, meta-examination, test studies and deliberate surveys.

### **REVIEW**

#### **DEFINITION OF OBESITY**

Stoutness is typically relying upon weight file (BMI) summed by weight in kilograms isolated by tallness in meters, squared. A BMI of 18.5 to 24.9 inside typical range, a BMI of 25–29.9 overweight and a BMI  $> 30$  is characterized as fat. Stoutness is likewise sorted into Class I (BMI 30 –

The risk of death from all causes is expanded if there should arise an occurrence of conservatives and butterball shaped for the two sexual orientations male and female in all gatherings. (7)

#### **Patients and Methods:**

34.9), Class II (BMI 35 – 39.9) and Class III (BMI  $> 40$ ). (8)

- **Principle changes created with obesity**
- **Incendiary reaction (inflammatory response)**

Notwithstanding its belongings in vitality balance and the mechanical burden..., fat tissue influences our bodies by its endocrine properties. Overweight turned into the outcomes when calories delivered, expanded calories consumed. The positive vitality balance at last causes fat tissue hypertrophy, complex versatile changes in the adipocytes, macrophage enrollment, and their blood supply and immunological properties. in the long run, adipocyte cell passing and unending tissue hypoxia happen.

#### **Metabolic disorder (syndrome)**

It is characterized as a gathering of conditions, as a rule, happen together than randomly alone and raise the risk of cardiovascular malady and hyperlipidemia. Another definition incorporates: raised abdomen perimeter (esteem known by individual populaces) + any two of the accompanying: raised triglycerides ( $\geq 150$  mg/dl), diminished HDL-C ( $\leq 40$  mg/dl in guys,  $\leq 50$  mg/dl in females), hypertension (systolic  $\geq 130$  as well as diastolic  $\geq 85$  mmHg) and expanded fasting glucose ( $\geq 100$  mg/dl). (9)

**PHYSIOLOGIC CHANGES**

CARDIAC

TITLE	Score
CHF (Congestive heart failure)	1
HTN (hypertension)	1
AGE $\geq$ 75	
AGE 65-74	1
DM (Diabetes Mellitus)	1
Stroke or TIA (transient ischemic assault)	2
Vascular issue (before MI, PAD OR fringe blood vessel sickness, aortic thrombus)	1
Sex sexual orientation (more in female)	1

**Table(A): Impact of obesity on the cardiovascular framework:**

Respiratory

TITLE	Changes with obesity
(FRC) Functional residual capacity	Decreased
(WOB)Work of breathing	Elevated
(VC) Vital capacity	Decreased
(TLC)Total lung limit	Remain constant. morbidly obese decreased
(ERV) Expiratory reserve volume	Decreased
(FEV1) Forced expiratory volume in 1st S	Also remain constant ...
Forced vital capacity (FVC)	Remain constant ...decreased with morbidly obese patients
FEV1/FVC	Remain constant .... decreased with morbidly obese patients
(DLCO) Diffusing capacity of the lung for carbon monoxide	Remain constant .....

**Table (B)..... Effect of obesity on breath:**

System	Main Effects	Monitoring
Cardiovascular		<ul style="list-style-type: none"> <li>• ECG in case of cardiac problems is predicted</li> </ul>
	Coronary artery syndrome	<ul style="list-style-type: none"> <li>• Efficient tools can be used to detect the risk of perioperative disorders (MACE) major adverse cardiac event.</li> <li>• Gave that danger of MACE <math>\geq 1\%</math> and utilitarian condition is poor, stress testing ought to be finished</li> </ul>
	PASP (pulmonary artery systolic pressure)	<ul style="list-style-type: none"> <li>• Right ventricular hypertrophy (RVH), aspiratory hypertension (PTH) provided that ECG appears, acceptable group branch square, right hub deviation.</li> <li>• Reverberation to assess left and right ventricular capacity, morphology, valvular condition and to distinguish aspiratory supply route weight</li> <li>• Right heart catherization.</li> </ul>
	CHF (congestive heart failure)	<ul style="list-style-type: none"> <li>• Chest X ray</li> <li>• Echocardiography.</li> </ul>
Respiratory		
	Dyspnea	<ul style="list-style-type: none"> <li>• Chest X ray</li> </ul>
	Asthma	<ul style="list-style-type: none"> <li>• Pulmonary function testing to detect restrictive or obstructive pattern</li> </ul>
	(OSA) Obstructive sleep apnea	<ul style="list-style-type: none"> <li>• BY history, examination, investigation</li> <li>• Use polysomnogram</li> <li>• Start CPAP/biPAP before surgery</li> </ul>
	(HS)Hypoventilation syndrome	<ul style="list-style-type: none"> <li>• ABG (Arterial blood gas)</li> </ul>
Gastrointestinal		
	GERD (gastro oesophageal reflux disease)	<ul style="list-style-type: none"> <li>• consider 24-h pH monitoring</li> <li>• consider upper endoscopy</li> <li>• consider Esophageal manometry</li> <li>• consider Barium swallow (upper gastrointestinal arrangement)</li> </ul>
	Nonalcoholic greasy liver sickness (NAFLD)	<ul style="list-style-type: none"> <li>• consider Liver capacity tests (LFTs)</li> <li>• consider Triglyceride level</li> <li>• consider Liver ultrasound gave that LFTs are expanded or symptomatic biliary issue</li> </ul>
	Helico- bacter. Pylori (H.pylori)	<ul style="list-style-type: none"> <li>• consider Stool antigen test</li> <li>• consider Urea breath test</li> <li>• consider Endoscopy – quick urease test</li> </ul>
Endocrine		
	(DM) Diabetes mellitus	<ul style="list-style-type: none"> <li>• consider Hgb A1c</li> <li>• consider glucose level measurement</li> </ul>
Hematologic		
	Venous thrombo-embolism) ....	<ul style="list-style-type: none"> <li>• Assess VTE threat: level of obesity, maturing, history of DVT previously, hypercoagulable state or history of harmful malady, fixed status...</li> </ul>
Psychologic		<ul style="list-style-type: none"> <li>• Assess Psycho-social-conduct issue</li> </ul>
	ANXEITY AND Melancholy	<ul style="list-style-type: none"> <li>• pay attention for patients at dnager for suicide</li> </ul>
	Binge eating changes (focus for patients at dnager for suicide)	
Nutritional		<ul style="list-style-type: none"> <li>• Think about Iron profile, folate, 25-hydroxyvitamin D, B12</li> <li>• Measure calcium, magnesium, phosphate (electrolytes levels)</li> </ul>

**Table (c)..... Effect of obesity on different body systems:**

## Conclusion

- Obese critically ill patients show crucial difficulties.
- Patho-Physiological abnormalities, changes in danger of organ failure and obstacles, drug doses abnormalities, and logistical problems should be recognized to introduce the best ever care of those obese patients.
- It should be mentioned that there is no fixed or standard (obese-patients), however, obesity is one factor among many ones to be known and considered, and a lot of standard practices do not need additional interest for obese patients... How obesity affects end results from critical illness is still a mysterious and unclear issue, in spite of the balance of evidence that does not refer to an increased mortality rate.
- also, research for both the risk and good beneficial results of obesity in critical illness has the priority to increase and improve care for obese patients and may need to motivate a better global recognition of ICU pathophysiological problems.

## References

1. Vincent, Heather K, Kfir Ben-David, Juan Cendan, Kevin R Vincent, Kelley M Lamb, and Amanda Stevenson. 2010. "Effects of Bariatric Surgery on Joint Pain: A Review of Emerging Evidence." *Surgery for Obesity and Related Diseases* 6 (4): 451–60.
2. Griffiths, John, Robert A Hatch, Judith Bishop, Kayleigh Morgan, Crispin Jenkinson, Brian H Cuthbertson, and Stephen J Brett. 2013. "An Exploration of Social and Economic Outcome and Associated Health-Related Quality of Life after Critical Illness in General Intensive Care Unit Survivors: A 12-Month Follow-up Study." *Critical Care* 17 (3): R100.
3. Mokdad, Ali H, Earl S Ford, Barbara A Bowman, William H Dietz, Frank Vinicor, Virginia S Bales, and James S Marks. 2003. "Prevalence of Obesity, Diabetes, and Obesity-Related Health Risk Factors, 2001." *Jama* 289 (1): 76–79.
4. Westerly, Blair D, and Ousama Dabbagh. 2011. "Morbidity and Mortality Characteristics of Morbidly Obese Patients Admitted to Hospital and Intensive Care Units." *Journal of Critical Care* 26 (2): 180–85.
5. Nasraway, Stanley A, Matthew Albert, Anne M Donnelly, Robin Ruthazer, Scott A Shikora, and Edward Saltzman. 2006. "Morbid Obesity Is an Independent Determinant of Death among Surgical Critically Ill Patients." *Critical Care Medicine* 34 (4): 964–70.
6. Erickson, Kristin J, Karen A Monsen, Ingrid S Attleson, David M Radosevich, Gary Oftedahl, Claire Neely, and Diane R Thorson. 2015. "Translation of Obesity Practice Guidelines: Measurement and Evaluation." *Public Health Nursing* 32 (3): 222–31.
7. Flegal, Katherine M, Margaret D Carroll, Cynthia L Ogden, and Clifford L Johnson. 2002. "Prevalence and Trends in Obesity among US Adults, 1999-2000." *Jama* 288 (14): 1723–27.
8. Rayner, Geof, and Tim Lang. 2010. "Obesity: Using the Ecologic Public Health Approach to Overcome Policy Cacophony." *Clinical Obesity in Adults and Children*, 452–70. <https://doi.org/10.1002/9781444307627.ch33>.
9. Somers, Virend K, David P White, Raouf Amin, William T Abraham, Fernando Costa, Antonio Culebras, Stephen Daniels, et al. 2008. "Sleep Apnea and Cardiovascular Disease: An American Heart Association/American College of Cardiology Foundation Scientific Statement from the

**10.**American Heart Association Council for High Blood Pressure Research Professional Education Committee, Council On ." *Journal of the American College of Cardiology* 52 (8): 686–717.

**11.**Simonneau, Gerald, Nazzareno Galie, Lewis J Rubin, David Langleben, Werner Seeger, Guido Domenighetti, Simon Gibbs, et al. 2004. "Clinical Classification of Pulmonary Hypertension." *Journal of the American College of Cardiology* 43 (12 Supplement): S5--S12.