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Perioperative Management of the Patient with Obesity

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Topic

Obesity

- Obesity is "defined as a Body Mass Index(BMI) that is greater than or equal to 30 kg/m² (Lee, 2018, p. 1318)
 - Centers for Disease Control (CDC) defines BMI as a person's weight in kilograms divided by the square of height in meters. A high BMI can indicate high body fatness.
 - If your BMI is less than 18.5, it falls within the underweight range.
 - If your BMI is 18.5 to <25, it falls within the healthy weight range.
 - If your BMI is 25.0 to <30, it falls within the overweight range.
 - If your BMI is 30.0 or higher, it falls within the obesity range.
- Obesity is frequently subdivided into categories:
- Class 1: BMI of 30 to < 35
 - Class 2: BMI of 35 to < 40
 - Class 3: BMI of 40 or higher. Class 3 obesity is sometimes categorized as "severe" obesity (CDC, 2022)

Signs & Symptoms

- The symptoms of obesity go beyond excess body fat.
- Some symptoms may increase your risk of developing certain diseases and disorders. In some cases, these may be life-threatening or even fatal.
- Common Adult Obesity Symptoms & Symptoms:
 - Excess body fat, particularly around the waist
 - Shortness of breath
 - Sweating more than usual
 - Snoring
 - Trouble sleeping
 - Skin problems from moisture accumulating in the folds
 - Inability to perform simple physical tasks you could easily perform before weight gain
 - Fatigue, which can range from mild to extreme
 - Pain, especially in the back and joints
 - Psychological issues such as negative self-esteem, depression, shame, and social isolation (VeryWellHealth, 2022).

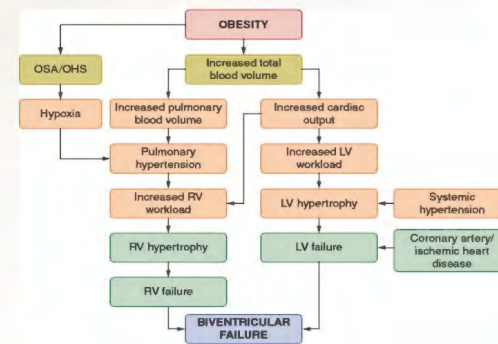
Underlying Pathophysiology

- The main cause of obesity is long-term energy imbalance between consumed calories and expended calories (Lin & Li, 2021)
- Obesity is a complex multifactorial disease that accumulated excess body fat leads to negative effects on health (Lin & Li, 2021)
- Genetics may also be a possible cause for dysregulation between caloric intake and expenditure (Lang et al, 2017).
- The pathogenesis of obesity involves regulation of calorie utilization, appetite, and physical activity, but have complex interactions with availability of health-care systems, the role of socio-economic status, and underlying hereditary and environmental factors(Lin & Li, 2021)

Significance of Pathophysiology

- Drug dosing is altered. Obesity has significant effects on the metabolism and pharmacokinetic profiles of most anesthetic agents (Brodsky, 2018).
- Trained anesthesiologist have trouble with tracheal intubation frequently in morbidly obese patients. Obesity can compromise a patient's airway and make laryngoscopy more difficult (Brodsky, 2018).
- Studies have shown obese patients with a BMI greater than 40 kg/m² are susceptible to higher risk of unwanted perioperative events, including airway complications and overnight admissions (Lee, 2018).
- Raised body mass index (BMI) is a risk factor for noncommunicable diseases such as diabetes, cardiovascular diseases, and musculoskeletal disorders, resulting in dramatic decrease of life quality and expectancy (Lin & Li, 2021).
- Obesity linked diseases include Type 2 diabetes mellitus (T2DM), cardiovascular diseases (CVD), metabolic syndrome, chronic kidney disease (CKD), hyperlipidemia, hypertension, nonalcoholic fatty liver disease, certain types of cancer, obstructive sleep apnea, osteoarthritis, and depression (Swinburn et al., 2011).
- Treating these conditions can place an additional load on healthcare systems: for example, it is estimated that obese have a 30% higher medical cost than those with a normal BMI (Swinburn et al., 2011).

Figure 2. Interrelationship of cardiovascular and pulmonary sequelae of obesity (Anesthesia Key, 2016).



Implications for Nursing Care

- When an obese patient needs nursing care, physical size can complicate even the most basic interventions, regardless of the practice setting (Camden, 2009).
- Physical size can complicate most nursing interventions for obese patients. Skin care, respiratory challenges, assessment and resuscitation measures, altered drug absorption, intravenous access, and immobility can pose nursing concerns (Camden, 2009)
- If resuscitation measures become necessary, and cardio-pulmonary resuscitation (CPR) is needed, a Doppler may be used to hear blood flow through the carotid artery to determine efficacy of compressions (Banyai et al., 1993)

Diagnosis

- Calculating your BMI. Your doctor will check your body mass index (BMI). A BMI of 30 or higher is considered obesity. Numbers higher than 30 increase health risks even more. Your BMI should be checked at least once a year because it can help determine your overall health risks and what treatments may be appropriate (MayoClinic, 2022).
- Measuring your waist circumference. Fat stored around the waist, sometimes called visceral fat or abdominal fat, may further increase the risk of heart disease and diabetes. Women with a waist measurement (circumference) of more than 35 inches (89 centimeters) and men with a waist measurement of more than 40 inches (102 centimeters) may have more health risks than do people with smaller waist measurements (MayoClinic, 2022).

Treatment

- Weight loss (such as 5–10 per cent) should be encouraged before surgery to prevent or treat obesity-related co-morbidities and to improve operating conditions for the surgeon (Carron et al., 2020).
- Knowledge of optimal drug dosing scalars is necessary for safe and effective anesthesia (Carron et al., 2020).
- Appropriate operating tables and other equipment are required for safe anesthesia in obese patients (Carron et al., 2020).
- Administering oxygen before induction of general anesthesia aims to increase oxygen reserve, thereby extending the safe apnea period (Carron et al., 2020).
- Obese patients have an increased risk of extubation failure, which can be reduced by careful intraoperative management and an appropriate awakening plan. Full monitoring should be maintained until discharge from the PACU. The patient should be placed in a head-elevated or semi-seated position (Carron et al., 2020).

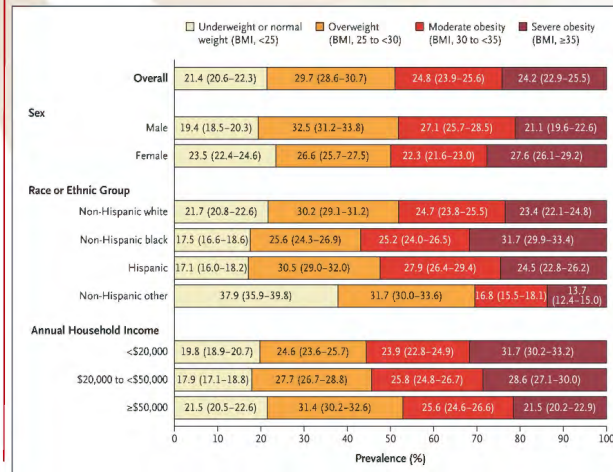
Conclusions

- Obese patients undergoing surgery require comprehensive preoperative evaluation. Obesity-related conditions that may affect the perioperative course should be investigated. Obese patients should be prepared well in advance of surgery. Anesthesia and surgical staff experienced in caring for obese patients should manage these individuals. Specialized equipment is required, and proper monitoring is recommended for safe anesthesia. The anesthetic approach, specific surgical procedure and plan for postoperative care should be shared with the entire operating room team before the patient enters the room. Additional perioperative precautions are necessary to reduce complications in patients with severe morbid obesity (Carron et al., 2020).
- In conclusion, improved understanding of the various dimension of obesity, including propensity to regain lost weight, interindividual differences in pathogenesis, and response to therapy, is needed for developing effective as well as cost-effective interventions (Lin & Li, 2021).

Perioperative Considerations

- Excess body fat can alter drug absorption, depending on the medication. Additionally, the dosage of some medications is calculated using the patient's actual body weight, while the dosage of other medications is based on ideal body weight (Camden, 2009)
- Intravenous (IV) access can also be challenging in obese patients.
- The most common abnormalities are reduced expiratory reserve volume and functional residual capacity. Studies also suggest that increased pulmonary blood volume leads to congestion which results in thickening of the airway wall, thus reducing the size of the airway (Carron et al., 2020).
- In assessing obese patients, a blood pressure cuff sufficient to fit the patient comfortably is essential. Using a cuff that is too small or taping the cuff together to attempt to make it fit, will lead to an inaccurate reading (Camden, 2009).
- Wound healing is problematic because blood supply to adipose tissue is usually compromised, which diminishes oxygen and nutrients necessary to prevent breakdown and promote healing (Carron et al., 2020).

Figure 1. Projected National Prevalence of BMI Categories in 2030, According to Demographic Subgroup (Ward et al., 2019).



References



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