

Pathophysiology of Morbid Obesity

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Introduction

Obesity is an epidemic disease which is increasing in frequency in Australia and New Zealand.

It is associated with changes in many body systems. It is increasingly a major public health issue. The prevalence of significant obesity continues to rise in both developed and developing countries.

Obese patients may provide significant challenges to the anaesthetist. A knowledge and understanding of the pathophysiology of obesity is important in the provision of good anaesthetic care to this group of patients.

Definition

Obesity is a condition of excess body fat. Morbid obesity is a condition of an even greater excess of body fat.

Obesity is most commonly measured using the Body Mass Index (BMI). BMI is calculated by dividing body mass in kilograms by the square of height in metres, i.e. kg/m^2 . This is currently the most commonly used measurement in clinical practice in Australia.

In adults, a person with a BMI greater than 30 kg/m^2 is considered obese.

A person with BMI greater than 35 kg/m^2 is considered morbidly obese.

A person with BMI greater than 55 kg/m^2 is considered super morbidly obese.

Physiology

The control of body weight is centrally controlled.

An imbalance in the control mechanisms of body weight may lead to obesity and morbid obesity.

Pathophysiology

If the obese condition persists over time then a number of pathophysiological changes to body systems may ensue.

Some of these changes are:

- **Cardiovascular** Sudden death, cardiomyopathy, hypertension, ischaemic heart disease, hyperlipidaemia, cor pulmonale, cerebrovascular and

peripheral vascular disease, varicose veins, venous thrombosis, pulmonary embolism

- **Respiratory** Obstructive sleep apnoea syndrome (OSAS), obesity hypoventilation syndrome (OHS), restrictive lung disease
- **Endocrine** Diabetes, Cushing's disease, hypothyroidism, infertility
- **Gastrointestinal** Gastro-oesophageal reflux disease (GORD), hiatus hernia, gallstones, inguinal hernia
- **Genitourinary** Menstrual abnormalities, female urinary incontinence, renal calculi
- **Malignancy** Breast, prostate, colorectal, cervical and endometrial cancer
- **Musculoskeletal** Osteoarthritis of weight bearing joints, back pain
- **Immune system** Wound infection and delayed healing

Conclusions

We can expect to see increasing numbers of obese patients on our operating lists; there are often significant associated medical conditions.

Understanding the pathophysiology of morbid obesity will aid the practitioner in the provision of safe anaesthetic and perioperative care to these patients.