Physiology of Obesity

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INTRODUCTION

The obese patient is now a norm rather than an exception in modern day practice. The obese patient has physiological changes that can threaten life especially with changes occurring in tissues and systems responsible for oxygen balance. The greater body mass increases oxygen consumption in the face of precarious oxygen supply and ultimately translates to a higher risk of imbalance between oxygen supply and demand (Figure 17.1, overleaf).

Obesity is usually measured or defined in terms of the body mass index (BMI), which is the weight (in kilograms) divided by the square of the height (in metres). It is generally accepted that a BMI between 18.5–25 kg/m² indicates normal weight, 25–30 kg/m² overweight, 30–40 kg/m² obesity, and above 40 kg/m² morbid obesity. The classifications are arbitrary as factors such as an individual’s body size and muscle bulk are not taken into consideration. For example, in some Asian populations, a BMI above 23 kg/m² is classified as overweight because of smaller Asian frames compared with Caucasians. However, the BMI is a useful measure of the adiposity of an individual.

THE AIRWAY

Obstructive Sleep Apnoea

The obese patient is more prone to develop upper airway obstruction. This is because there is more fat tissue around the pharynx and it is in this area that the airway is likely to obstruct especially during deep rapid eye movement (REM) sleep and in the unconscious state. REM sleep results in hypotension and relaxation of the pharyngeal muscles and this causes narrowing of the airway and subsequent airway obstruction and hypoxia (Figure 17.2, p. 133). This may happen many times during sleep, the frequency of which defines the severity of the condition of obstructive sleep apnoea (OSA). Hypoxia will strongly stimulate the respiratory drive, lighten sleep and result in patient’s