

Non-pulmonary cases
→ due to decreased output of red blood cells
→ Allergy destruction - due to smoking
→ ↓ oxygen carrying capacity of blood due to opening
27-08-2018

Therapeutic Gases

- * Oxygen
- * - Hypoxia
- * - Metabolic demands

Hypoxia may result from alteration in tissue perfusion, decreased oxygen content in blood, and decreased oxygen carrying capacity of blood.

It covers the basic need of animals life \Rightarrow O_2

Oxygen makes about 21% of the air at 1 atm pressure.

At high altitude, its pressure decreases, that results in the development of hypoxia.

There are various factors that also cause hypoxia.

For example:

- ↳ Low inspired oxygen fraction
- ↳ Increase diffusion barrier
- ↳ Hypoventilation

For the treatment of hypoxia.

An understanding the cause and effects of oxygen deficiency is very much important for therapeutic

use of oxygen.

Physiological Significance of O₂

Oxygen is used therapeutically to correct and prevent hypoxia.

These are the normal functioning of the oxygen

Other than normal function that are also observed in some physiological function when oxygen is inhaled for prolonged period or in excessive amount. (Other system can also be disturbed)

1. Respiratory System

Initially in normal individuals it cause depression of respiratory system due to suppression of tonic-chemoreceptor trigger zone (reflex receptor could act as homeostatic reflex receptor)

When patient is inhaled oxygen for some period of time, ventilation is increased

2. Cardiovascular System

There are no significant effect that are observed on cardiovascular system

Oxygen Administration

Oxygen is supplied in steel cylinders at a compressed gas. In some countries oxygen cylinders and piping systems are color coated for safety measures. (As they contain explosive materials).

Therapeutic Use

• Correction of hypoxia:

Oxygen is used therapeutically to overcome hypoxia by supplying through nasal cannula.

• Supply of oxygen in hyperbaric chamber

Hyperbaric chamber is also used for oxygen administration. It has higher pressure of air and higher relative pressure. It supplies oxygen at higher pressure of oxygen to overcome the severe tissue injury for the treatment of brain abscess. For treatment of Alzheimer's disease, allergic reactions and for AIDS patients and for bacterial infections. As it has bactericidal / bacteriostatic effect.

Toxic Effects:

Oxygen is required for cellular metabolism of O_2 - Neuronal metabolism, For energy production. So at higher level it cause toxic effects by converting into the reactive oxygen species.

Effect on Eyes:

Retrolental fibroplasia (In retina) in neonates. ↓

Fibrosis around the lenses, retina damage vision disturbed, that results in the blindness.

⇒ Effect on Respiratory System

At higher pressure of oxygen, there are the chances of lung damage and even the death of the patients occur.

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CO₂ Gas

Body metabolism is a source of CO₂ production.

In blood stream, it is carried as HCO₃⁻ ion partially in combination with haemoglobin or plasma protein or partially in the solution form where it is diffused into the lungs and then exhaled out.

Administration:

CO₂ gas is marketed as a Grey-metal cylinder in pure form or in combination with O₂ gas.

It is used in the concentration of 5% or 10% with O₂.

A safety measure is that the tank/cylinder containing CO₂ gas and oxygen are indicated by the specific colour that are also used for indication of

* - pure CO₂ tank

Similar to those that containing CO₂ purely

⇒ most common preferred is combination bec pure can cause respiratory acidosis.