

INTRODUCTION

Oxygen is very fundamental to human life and its deprivation leads to death very rapidly. In fact oxygen lack does not only kill human being but wrecks also its machinery. Normally the inspired air contains 20.93% oxygen. ⁽¹⁾

Oxygen is taken from air through respiratory passages by lungs and carried through blood to be distributed to body tissues at the final step. This process can be considered as formed of several steps : oxygen uptake, oxygen carriage, oxygen delivery. ⁽²⁾

Tissue oxygenation is the final goal of the combined work of both circulation and respiration. The principal function of the heart and lung is to ensure proper tissue oxygenation. This entails supporting O₂ delivery to tissues and CO₂ elimination, going in accordance with the metabolic requirements. This will maintain arterial blood O₂ and CO₂ partial pressures within a narrow range necessary for proper functioning of organs. The respiratory and cardiovascular systems are linked in a way to accomplish the process of proper tissue oxygenation over a wide range of metabolic requirements which may increase 30 fold from rest to heavy exercise. ⁽²⁾

Hypoxia is a broad term used to designate deprivation of oxygen regardless of its causes or site. Hypoxia may be classified into :

Hypoxic hypoxia as in high altitude.

Anemic hypoxia as in anemia.

Stagnant hypoxia as in heart failure.

Histotoxic hypoxia as in cyanide poisoning .⁽³⁾

So oxygen therapy is very useful and very necessary to combat hypoxia. Oxygen may be applied using many tools for example masks, nasal prongs, and chambers tents. It may be also applied under normal atmospheric pressure to enrich air content with oxygen for examples 25% 30%, 40%, 50% or purely as 100%. It may also be used under high pressures than atmospheric pressure as hyperbaric oxygen.⁽⁴⁾

Researches concerning O₂ gas are rapidly growing through all domains. So the present review will discuss the recent advances in Oxygen therapy & Hyperbaric oxygen therapy, recent advances in artificial oxygen carrier and recent advances in tissue delivery of oxygen.⁽⁴⁾

The review will consider also how to assess the above mentioned items using new methods and parameters.