UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Ipossia e Sistema Cardiovascolare: Dal Mt. Everest Allo Scompenso Cardiaco

2627-4-H4101D375

Aims

- Understand the physiological and pathological mechanisms related to oxygen metabolism and hypoxia.
- Analyze the impact of acute and chronic hypoxia on the cardiovascular system.
- Explore the clinical implications of hypoxia in common pathological contexts.
- Assess strategies for acclimatization and physiological adaptation to hypoxia.

Contents

- Physiology of oxygen metabolism.
- Classification and pathophysiology of various types of hypoxia.
- Effects of acute and chronic high-altitude exposure.
- Physiological adaptations to hypoxia.
- Role of hypoxia in common clinical conditions.
- Recommendations for cardiovascular patients at altitude.

Detailed program

1. Introduction to hypoxia: Definition and distinction between hypoxia and hypoxaemia. Classification according to extent (global, local) and cause.
2. Physiology of oxygen metabolism: Oxygen transport: partial pressure, saturation, arterial and venous content, haemoglobin dissociation curve. Physiological response to hypoxia: hyperventilation, chemoreceptor activation, mitochondrial adaptation.

3. Pathophysiological effects of hypoxia: HIF-1 axis and cellular response. Systemic effects: alterations in metabolism, vascularisation, immunity and inflammation
4. Acute hypoxia at high altitude: Environmental characteristics: reduced barometric pressure and inspired pO?. Immediate cardio-respiratory responses. Physiology of physical exertion at altitude.
5. Adaptation and acclimatisation: Short and long term ventilatory, haematological, cardiac and muscular changes.8. Hypoxia in OSAS, CHF and ischemic heart disease.
6. Chronic hypoxia and high altitude populations: Adaptations in native populations (Andes, Tibet, Ethiopia). Monge's disease and CMS (Chronic Mountain Sickness): diagnosis, pathophysiology, treatment.
7. Cardiovascular pathologies and staying at altitude: Management of the patient with decompensation, hypertension, or ischaemic heart disease in hypobaric environments. Effects of hypoxia on blood pressure, ventricular function, vasculopathy
8. Clinical conditions associated with hypoxia: Obstructive sleep apnoea syndrome (OSAS) and cardiovascular impact. Intermittent hypoxia and cardiovascular risk. Ischaemic heart disease and hypoxia-induced mechanisms.

Prerequisites

Medical Students from 4?? year on

Teaching form

Lectures

Textbook and teaching resource

Lecture slides

Semester

Second semester (March/April)

Assessment method

Attendance

Office hours

By appointment:

grzegorz.bilo1@unimib.it

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION