Artificial pulmonary ventilation in patients with COPD

Patogenesis

- COPD is characterized by chronic inflammation of the airways, lung parenchyma and pulmonary vasculature.
- Accumulation of macrophages, T Ly (CD8+), neutrophils.
- Mediators.
- Oxidative stress.
- Imbalance between the system of proteinases and antiproteinases.
- Muscle dysfunction – muscle microdisruption, oxidative stress, glucocorticoid therapy.

Etiology

- Smoking.
- Socioeconomic position.
- Enviromental factors.
- Recurrent respiratory infections.
- Lung disease at a young age.
- Bronchial hyperreactivity.
- Profesion.
- Alpha 1 protease inhibitor deficiency.

Pathophysiological changes

- Dry DC.
- Expiratory flow obstruction.
- Loss of lung elasticity
- V/Q abnormalities.
- Hyperinflation.
- Weakening of respiratory muscles.
- Abnormal „respiratory drive“.
- Pulmonary hypertension.

Clinical presentation

1. **Chronic brochitis** – the presence of cough for more than 3 months (exclusion of other causes - TU, etc.)
    - These individuals are usually obese, bulbous protrusion dominates.
    - Dyspnea is less in comparison to the emphysematic type, patients are cyanotic, tend to have polyglobulia and show signs of decompensated cor pulmonale.
        - They are referred to as "blue bloaters" - the bloated, swollen, blue type (also "blue bubble").
2. **Emphysema** – abnormal expansion distal to the terminal bronchioles, associated with destruction of the alveolar wall without signs of fibrosis.
    - Patients tend to have a large emphysematic chest, they are usually asthenic.
    - However, significant shortness of breath is not accompanied by polyglobulia or cyanosis. .
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Some authors refer to this type of patients as "pink puffers" - pink type (or "pink puffer"). Patients are short of breath but have pink skin.

Diferential diagnosis

- Bronchial ashtma.
- Cardiac failure.
- Bronchiectasis.
- TB.
- Obliterative bronchiolitis.
- Diffuse panbronchiolitis.

Treatment

- Intravenous or oral administration of corticoids is recommended as part of the treatment of hospitalized patients.
- An oral dose of 30–40 mg prednisolone/day for 7–10 days is considered effective and safe

→ longer administration does not increase the treatment effect and is associated with a higher risk of side effects (hyperglycemia, muscle atrophy).

- Administration of antibiotics is recommended for:
    - Patients with the simultaneous occurrence of three so-called cardinal symptoms - increased shortness of breath, increased amount of sputum and purulent nature of sputum.
    - Diseases requiring artificial pulmonary ventilation (including non-invasive ventilation).
- Manual or mechanical chest vibration may be beneficial in patients with high sputum production (more than 25 ml/d) or in patients with lobar atelectasis.
- There are no data demonstrating the beneficial effect of inhalation administration of secretolytics.
- Pulmonary rehabilitation may be beneficial in the recovery phase from an acute exacerbation of COPD.
- Before discharge, the initiation of treatment with a proven effect on the number of exacerbations and hospitalizations of patients with COPD should be considered

    → administration of long-acting inhaled bronchodilators.
    → administration of inhaled corticoids and their combinations.

Total or partial respiratory insufficiency?

- pCO_2 indicator of adequacy of ventilation!!!
- pO_2 ndicator of lung oxygenation function!!!

→ Partial insufficiency = hypoxia → Global insufficiency = hypoxia + hypercapnia.

- If a patient with hypoxic (partial) respiratory insufficiency is given oxygen, relief will occur.
- **A patient will global insufficiency** accumulates CO_2 in such a way that CNS loses sensitivity to its increased level and breathing depends only on the presence of**lack of oxygen** – hypoxia → pif we give more oxygen (more than approx. 2-4 l/min) we can alleviate the hypoxia that was holding breathing and the patient will **stop breathing**!

  !!!! → herefore, it is important in the first phase, using the examination according to Astrup, to distinguish what kind of hypoxia is involved

pH shows the degree of compensation, in an acute exacerbation CO_2 is high (can be chronic) and pH is low.

Links

Related articles

- COPD

References

- *Incomplete citation of lecture.*

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