Respiratory Care Quality Assurance

Nebulizer Therapy

What is a nebulizer?

- A nebulizer changes liquid medicine into fine droplets (in aerosol or mist form) that are inhaled through a mouthpiece or mask.
- Can be used to deliver bronchodialator (airway-opening) medicines such as albuterol /salbutamol 5 mg (Ventolin, Proventil, Airet), terbutalin 10 mg (Bricanyl) or ipratropium bromide 0,5 mg (Atrovent)
- A nebulizer may be used instead of a metered dose inhaler (MDI). It is powered by a compressed air machine and plugs into a electrical outlet.


NIDEK
Pulmo-Mist

- Babies and young children have trouble coordinating inspiratory effort by using inhalers and dry powder devices require a high minimum inspiratory flow rate
- Thus for children under age 3 preferably use nebulizers or space-inhalers
- Indicators for nebulizer therapy:
  - tightness in chest in allergy - bronchitis
  - increased or thick secretions - bronchiolitis
  - pneumonia - asthma
  - atelectasis - bronchus spasm
  - COPD - emphysema

- Benefits of the nebulizer therapy:
  - direct effect on the desired place on bronchial branches
  - large absorbing space in the lungs
  - absorbing is quick
  - the cell permeability in the lungs is better for many drugs than in the intestines or other mucous areas
  - the dose needed for desired effect is often smaller than oral dose
  - can be administered drugs which are not absorbed taken orally or they disperse during the first round metabolia

- Disadvantages

- in spite of the careful teaching and instructions the use of aerosol-inhalers can be difficult
  - dosing needs complicated inhalation devices
  - medicine to reach down to the lungs is not easy
  - the mucus of the lungs can prevent the absorbtion
  - the mucocilliaric clearence decreases medicines to stay upon the lungs so that medicines could be absorbed
  - inhaled medicine can stratify inside mouth and throat causing side effects

Asthma medicines

1. Anti-inflammatory agents

- A) **Corticosteroids** :basic asthma care beclomethasone, budenosidi, fluticasone,

  B) **System corticosteroids** orally and intravenously

2. Bronchodilators

A) Short-acting beta2-agonists – quick-relief ’’rescue’medicines: salbutamol, terbutaline

B) Long-acting beta2-agonists: formoterol, salmetorol if needed used together with corticosteroids

C) **Combination inhalers: ipratropium-salbutamol**

3. Cromolyn medicines: inhaled natriumcromolygate and nedocromolyn

4. Anticolinergics : inhaled ipratropium, oksitropium

5. Leukotrines: orally taken leukotrienes montelucast, zafirlucast

6. **Theophylline** :

- Theophylline / aminophylline are oldest used preparations for asthma care but now considered third or second-line agent
- narrow margin between therapeutic and toxic effects
- relaxes bronchial smooth muscles
- usually now used to relieve nocturnal and morning wheezing e.g. teophylliini 200–300 mg evening dose
- side-effects: gastrointestinal irritation, restlessness, anxiety, tremor, palpitations, headache, dizziness, convulsions, arrhythmias, hypotension, cardiac arrest

7. Magnesium sulfate iv.

- **Management of asthma**
- **if temporary intermittent symptoms** short-acting beta2-agonist inhaler is enough such as salbutamol
- **basic medicine for mild, moderate and severe persistent asthma** is inhaled anti-inflammatory corticosteroid such as beclomethasone or budenosidi 400–800 ug x 2 and fluticasone 250–500 ug x 2,

  (for school age children e.g. fluticasone 100 ug x 2, beclomethasone or budenosidi 200 ug x 2)
- **if needed then long-acting beta2-agonist** such as salmetorol, formoterol
- **anticolinergics:** inhaled ipratropium, oksitropine are short-acting bronchodialtors, adjunct to inhaled beta2-agonists in patients who have severe asthma

Oxygen