

ANTISEPSIS

Plan of lecture:

- Mechanical antiseptics
- Physical antiseptics
- Chemical antiseptics
- Biological antiseptics

Mechanical antisepsis

- **is based on surgical debridement of wounds**
- **involves excision of the edges, walls and the floor of wounds to remove the non-viable tissue and microorganisms within the wound**
- **is the major method to treat accidental, infected wounds**

Physical antiseptics uses

- **the law of**
 - capillarity
 - hygroscopicity
 - diffusion
 - osmosis
 - siphoning
- **ultrasound effects**
- **laser effects**

Physical antisepsis

These are the principles used:

- enhance drainage from wounds and pus from abscesses and empyemas
- facilitate flow to the outside (into a dressing or a special container with antiseptic solution)

Physical antisepsis

- **Wounds can be drained by using vinylchloride tubes of different diameters, which are placed in the wounds, abscess cavity, joints, pleural, abdominal cavity**
- **The pus and microorganisms are discharged through one or several drains**

Physical antiseptics

- **Chemical antiseptics, antibiotics can be inserted through the drainage into the wound or cavity.**
- **To provide a more effective washout of wounds and purulent cavities, apart from the drainage tube, another tube can be placed, through which antibacterial agents can be given and pus, blood and fibrin are discharged.**
- **combination of physical and chemical antiseptics results in continuous irrigation drainage.**
- **proteolytic enzymes are used as the washing solution, which promotes lysis of non-viable tissues, pus and fibrin**

Physical antiseptics

- If the draining cavity is sealed (sutured wound, pleural empyema, purulent arthritis), active aspiration, or vacuum drainage, can be used.
- Negative pressure in the system can be reached with vacuum aspiration. This is known to be the most effective way of drainage.
- It also helps reduce the size of the wound cavity and cause fast obliteration and removal of infection, and facilitates expansion of the lung collapsed as a result of the pressure of exudates in pleural empyema.

Chemical antiseptics

- **Synthetic antibacterial agents are used to combat bacterial infection in the wound**
- **Derivatives of nitrofurans**
 - *Furacilin*
 - *Furagin*
- **Acid group**
- **Oxidants**
 - *Hydrogen peroxide*
 - *Potassium permanganate*
- **Detergents**
 - *Chlorhexidine*
 - *Dioxvudin*

Topical chemotherapy involves

- application of antiseptics to dressing materials for wounds and burns; these may be applied in the form of solutions used to wash the wounds during dressing, soaking the dressing packs as well as in the form of creams and powders
- application of antibacterial solutions directly into the wound, closure of the cavity with subsequent aspiration through a drain- washing drainage.

Systemic chemotherapy

- oral use of antibacterial agents:
sulfonamides
- intravenous use of chemotherapeutic
compounds: e.g. dioxidin

Biological antiseptics

- Antibiotics
- proteolytic enzymes
- Immune compounds

Antibiotics

- Penicillins

Antibiotics

- Penicillins
- Cephalosporins

Antibiotics

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- Aminoglycosides

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- Fluorquinolones

Characteristic of antibiotic therapy

- **Indications :antibiotics should not be prescribed unless they are indicated**
- **Contraindications (allergic reactions, the presence of renal, hepatic diseases, hearing defects or pregnancy)**
- **The choice of antibiotics: antibiotics are chosen individually according to the causative infectious agent**

Combination of antibacterial agents

- is necessary in cases of microbial associations
- can be synergistic, antagonistic or indifferent

Dosing of antibiotic

- **Antibacterial effect of the agents only occurs if concentrations at the focus of infection or in blood for a particular period are being maintained.**
- **minimum inhibitory concentration is the least amount of drug necessary to inhibit visible growth after 24 hours**

The duration of antibiotic therapy

- The duration of antibiotic therapy depends on the rate of inhibition of inflammation and normalisation of body temperature.
- The course of treatment in acute infection is about 5—7 days.
- If the treatment needs to be prolonged, the antibiotic should be changed.
- Earlier stopping the antibiotic therapy may cause relapse

proteolytic enzymes

- They can dissolve necrotic tissues, fibrin, pus, prevent oedema and enhance the therapeutic effect of antibiotics
- can be used topically for infected wounds or trophical ulcers
- Solutions of enzymes can be introduced into various cavities: the pleural cavity in purulent pleurisy, the joint cavity in purulent arthritis or in an abscess cavity. The drug is given through a drainage tube

proteolytic enzymes of

- animal origin
 - trypsin
 - chymotrypsin
 - chymopsin
 - ribonuclease
- bacterial origin
 - terrilitin
 - streptokinase
 - collagenase
 - asperase
 - ribonuclease
 - iroxol
- plant origin
 - papain
 - bromelain

Immune compounds

- For active immunization
 - *Staphylococcal anatoxins*
 - *Tetanus antitoxin*
- For *passive immunization*
 - *Antistaphylococcal hyperimmune plasma*
 - *Antistaphylococcal gamma globulin*
 - *Antitetanus serum*
 - *Antigangrene serum*
- *Immune stimulators*
 - *Prodigiozan*
 - *Levamisole*
 - *Lyzozyme*