Pharmaceutical support of dental surgery

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Antibiotic therapy

The antibiotics: special medicaments

By the effect: eliminate pathogens

- **bactericidal antibiotics:** *kill the bacteria*
- **bacteriostatic antibiotics:** *stop the development and growth of bacteria*
- **narrow/broad spectrum**

The oral cavity is a bacterium reservoir;

Bacteria gateway (infection can spread toward to the lesion of mucous membrane): following *wounds, malign tumors, previous infection, iatrogenic injuries*

Antibiotic therapy

The beginning of <u>infection:</u>

- **Staphylo-, Streptococcus monoinfection**
- **polymicrobiosis - subsequent colonization by more anaerobs (Prevotella, Peptostreptococc., Veilonella, Porphyromonas, Fusobacteria, Actinomyces)**

Conditions of the correct antibiotic therapy:

- **correct indication (more and more needless th.)**
- **with adaequate antibiotic (**after bacteriological specimen)
- **in suitable dose**
- **sufficient period**

Antibiotic therapy

Questions of antibiotic therapy:

1. When?

2. What kind of?

3. How much?

4. How long time?

I. In case of inflammation:

- **initial therapy:**

  with an effectiv antibiotic *(if the symptoms become better, we continue it till the reconvalescence)*

  usually amoxilcillin, takes for min. 4-5 days (av.7 d)

- **object therapy:**

  with an adequat antibiotic after bacteriological specimen and after antibiogram (change for broad spectrum – Avelox?)

II. Antibiotic profilaxis:

after endocarditis
neutropenia
immunsuprimated
} **patients**

dosage: one maximum dose befor the dental/surgical treatment

e.g.: 2 g Amoxicillin / 600 mg Dalacin C

Antibiotic therapy

III. Perioperativ profilaxis (different)

in bigger surgical cases

against intraoprerativ bakteriaemia

dose: one average dose
e.g.: 1000mg Augmentin oral / 1200mg iv.
300mg Dalacin oral/iv.

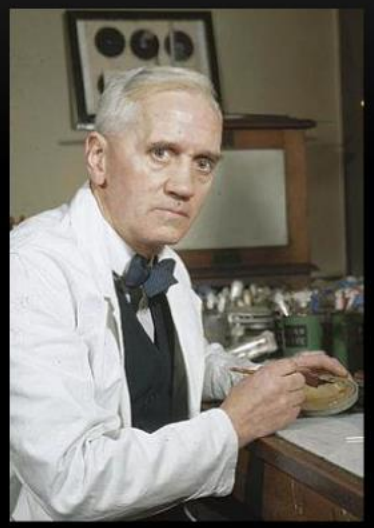
Classification of antibiotics

1. Penicillins

Approach to the ideal antibiotic/first line

The effects:

- **bactericide**
- **wide efficiency**
- **no toxic for the patient**
- **good distribution**
- **bacterium cell wall damage**
- **inexpensine**



Alexander Fleming 1929

Adverse drug reaction: allergy

- **early allergy: anaphylaxis with serious symptoms**
- **following allergy: with skin symptoms**

Penicillins

Amoxicillin: semisynthetic penicillin

has efficiency against every Gram + and Gram – bacterium

f.e. Duomox:

good absorption

only pill: 125, 250, 350, 500, 750, 1000 mg

dose: 2x1000 mg/day

there are more and more bakteria with ß laktamaze enzym: this removals the amoxicillin

+ clavulanic acid: ß laktamaze inhibitor

Amoxicillin + clavulanic acid / Augmentin Duo /

very effectiv antibiotic

spectrum: Gram +, Gram -, anaerobs

Penicillins

Augmentin-Aktil-Curam Duo / amoxicillin + clavulanic acid /

- **is an effektive antibiotic against the G +, G – aerob, anaerob bacteria**
- **pill: 250/125; 500/125; 875/125mg**
- **injection: 1000/200 mg**
- **suspension: 125/31.25; 250/62.5; 400/57 mg/5ml**
- **the first antibiotic what we use**
- **dosage:**
  - **endocarditis prophylaxis: 2g before treatment**
  - **perioperative prophylaxis: 1000-1200 mg before or during surgery**
  - **treatment: 2x1000mg/day vs. 2x10ml (457mg/5ml) vs. 2x1.2 g iv.**

3x40/5 mg/bmkg for children (suspension)

Antibiotics

2. Cephalosporin group

- bactericide
- no toxic
- destroy the cell wall
- effective: Garm +, Gram -, anaerobs (for penicillin resistant bacteria)
- cross allergy with penicillin
- I., II. and III. generation

Cefalexin – Pyassan: caps 250 mg

- dosage: 1-4 g/day

Cefuroxim – Zinnat: 125, 250, 500 mg

- dosage: 2x250 mg; 2x500 mg

Side effects:

- skin eruptions
- fever
- diarrhoea

Antibiotics

3. Macrolide group

- bacteriostatic
- protein synthesis inhibitor
- Gram +, Gram – and 50% of anaerobs, (intracellular bacteria)
- side effects: stomach-ache, nausea, vomitus
- Erythromycin – caps: 125, 250 mg
- dose: 4x250 mg
    - Modern macrolids with less side effects
    - azithromycin (Sumamed) : 2x500mg
    - clarithromycin (Klacid): 1-2x500mg
    - advantageous in the infections of oral cavity and in sinusitis
    - patient with penicillin and cephalosporin allergy: macrolid to propose

Antibiotics

4. Aminoglycoside group

- bactericide
- toxic antibiotic (oto- and nephrotoxic)
- low therapy index
- only local

Gentamycin : - injection

- septopal chain with Gentamycin perle

- Garamycin sponge

- in osteomyelitis

Antibiotics

5. Clindamycin

- protein synthesis

- effectivity : Gram+, anaerobs but ineffectiv against the Gram –
- potent level in bones and articulations: by chronic osteomyelitis

Dalacin (caps and injection)

- dose: 4x150-300 mg/day

may be effective

- Side effects: diarrhoeae because of dysbacteriosis

psendomemronosus colitis (protectiv enteral

anaerobs are killed)

Don't propose Dalacin as a first antibiotic in dentoalveolar practice!

Second line antibiotic administration

Antibiotics

6. Tetracyclin group

- bacteriostatic
- inhibit the protein synthesis
- ineffective: - anaerobs

  - staphylococci, streptococci

  - klebsiella, E. coli

  - it isn't the suitable antibiotic

  - side effect: diarrhoeae pseundomembranosus colitis

  mycotic superinfection

Doxicyclin /pill/: 100, 200 mg dose:2x200mg (just after antibiogram)

Antibiotics

7. Quinolone group

- strong antimicrobial activity
- good pharmacokinetic effect
- stop the giraze enzym of DNS → inhibit the synthesis – bactericide
- effective: Gram +, Gram – but ineffective more anaerobs
- side effect: less

Ciprobay: pill, dosage: 2x500mg (in salivary gland inflammation)

- Summing up:
  - the first antibiotic: amoxicillin + clavulanic acid
  - by early penicillin allergy: clindamycin (4x300mg)
  - after: quinolones (broad spectrum): Levofloxacin: Tavanic:1x500mg,

+ anaerobs Moxifloxacin: Avelox: 1x400mg

Antibiotics

Summing-up

- the first antibiotic: amoxicillin + clavulanic acid: Augmentin Duo 2x1g
- by early penicillin allergy: clindamycin: Dalacin, Klimicin (4x300mg)

- after: quinolones (broad spectrum): Levofloxacin: Tavanic:1x500mg, Moxifloxacin: Avelox: 1x400mg

  + against anaerobs: metronidazole – Klion, Supplin 2x500mg

Antibiotic profilaxis

- to protect the endangered patient against a known bacterium
- indications by Weinstein:
    - endocarditis prophylaxis
    - neutropenia
    - immunsuppressed
- prevention of imminent infection for patients at highest risk of IE

- Amoxicillin – semisynthetic penicillin

dosage: 2 g before treatment

- Dalacin – clindamycin

dosage: 600 mg

Antibiotic profilaxis

Recommendations	Class[a]	Level[b]
Antibiotic prophylaxis should be considered for patients at highest risk for IE: (1) Patients with any prosthetic valve, including a transcatheter valve, or those in whom any prosthetic material was used for cardiac valve repair. (2) Patients with a previous episode of IE. (3) Patients with CHD: (a) Any type of cyanotic CHD. (b) Any type of CHD repaired with a prosthetic material, whether placed surgically or by percutaneous techniques, up to 6 months after the procedure or lifelong if residual shunt or valvular regurgitation remains.	IIa	C
Antibiotic prophylaxis is not recommended in other forms of valvular or CHD.	III	C

CHD = congenital heart disease; IE = infective endocarditis.
[a]Class of recommendation.

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Antibiotic profilaxis

Recommendations	Class[a]	Level[b]
A. Dental procedures		
• Antibiotic prophylaxis should only be considered for dental procedures requiring manipulation of the gingival or periapical region of the teeth or perforation of the oral mucosa	IIa	C
• Antibiotic prophylaxis is not recommended for local anaesthetic injections in non-infected tissues, treatment of superficial caries, removal of sutures, dental X-rays, placement or adjustment of removable prosthodontic or orthodontic appliances or braces or following the shedding of deciduous teeth or trauma to the lips and oral mucosa	III	C

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Antibiotic profilaxis

Situation	Antibiotic	Single-dose 30–60 minutes before procedure	
		Adults	Children
No allergy to penicillin or ampicillin	Amoxicillin or ampicillin[a]	2 g orally or i.v.	50 mg/kg orally or i.v.
Allergy to penicillin or ampicillin	Clindamycin	600 mg orally or i.v.	20 mg/kg orally or i.v.

[a]Alternatively, cephalexin 2 g i.v. for adults or 50 mg/kg i.v. for children, cefazolin or ceftriaxone 1 g i.v. for adults or 50 mg/kg i.v. for children.
Cephalosporins should not be used in patients with anaphylaxis, angio-oedema, or urticaria after intake of penicillin or ampicillin due to cross-sensitivity.

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Antifebrile-/painkiller medication

1, nonsteroid medicaments

- novamidazophen – Algopyrin
- paracetamol – Panadol
- acetilszalicilic acid – Aspirin
- antifebrile
- painkiller

- Side effect: GI bleeding, renal failure

- diclophenac – Cataflam
- indometacin – Indometacinum (rectal administration)

3 effects:

- painkillers
- decreasing inflammation
- decreasing oedema
- COX2-inhibitor:
- nimesulid – Xilox

Painkiller medication

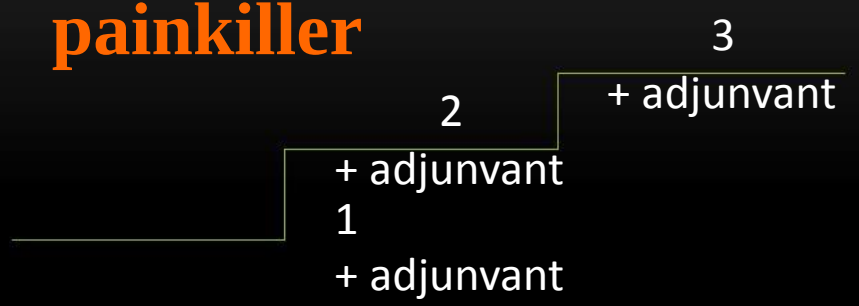
2, opioid derivates

- tramadol (weak opioid) – Contramal 3x50-150mg
- pethidin – Dolargan tbl., inj.
- fentanyl (strong opioid) – Durogesic plaster 25µg→100µg (transdermal)
- morphine – M-Eslon capsule, MST Continus 2x30mg initial dose
    - oral administration (best)
    - rectal ~
    - subdermal ~
    - Spinal ~

+ metoclopramid (Cerucal against nausea)

increase

Reliefe of tumor pain
The 3 stairs of tumor painkiller



1. Non opioid, non steroid minor analgetics:

NSAID

diclophenac

2. Weak opioid:

tramadol

codein

dihydrocodein

3. Strong opioid

fentanyl (inj., plaster)

morphin (inj., pill: M-Eslon)

methadon

+ drug against: - nausea (Cerucal)
- inflammation
- depression

e.g.: - steroids (Oradexon),
- benzodiazepine (Frontin, Dormicum),
- neuroleptics (Tegretol)

Drug administration in some kind of diseases

1, inflamations

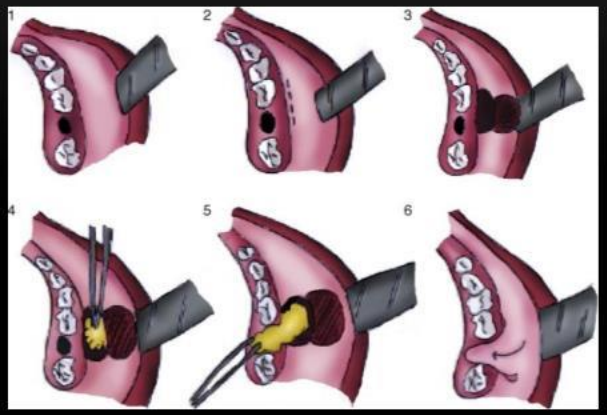
- **(abscess, cellulitis)**
  - **Antibiotic:** - serious inflammation
    - diabetes mellitus/immunodeficiency
  - **Painkiller:** diclophenac Cataflam
- **osteonecrosis (MRONJ, radio-)**
  - **Antibiotic:** 2-3 days before surgery and 2 more weeks after: Augmentin, Dalacin, Levofloxacin, Moxifloxacin
  - **Painkiller:** Cataflam, Tramadol

Drug administration in some kind of diseases

2, injuries

- **soft tissue:**
  - **oral cavity:** antibiotic av. 3-5 days
  - **skin:** one shot antibiotics
- **fractures**
  - **open:** to the oral cavity/to the sinus – antibiotic/painkiller necessary, cold dressing
  - **closed:** painkiller, one shot perioperative antibiotic

Drug administration in medical care



1, oral soft tissue surgery

- **oroantral fistula closure**
  - Preoperative painkiller
  - 7 days antibiotic administration, painkillers, nasal spray

- **benign/malignant tumors**

  ~

Drug administration in medical care

2, oral bony surgery

- **impacted teeth**

septic surround, cyst, more than 2 impacted teeth removal - antibiotic

- **cysts ~**
- **dysgnathia**

preoperative antibiotic, painkiller, steroide

Drug administration in medical care

3, surgery on the skin surface

- **basal cell carcimoma on face:** one shot AB
- **lip cancer:** sometimes AB necessary
- **neck dissection:** 7 days AB
- **branchial cleft cyst:** one shot AB
- **salivary gland exstirpation:** 5-7 days AB

Thank you for your attention