GUIDELINES ON USE OF ANTIBIOTICS IN DENTAL PRACTICE

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Antibiotics are usually used in dental practice for different purposes:

- Treatment of present odontogenic infection.
- Prophylaxis against wound infection.
- Prophylaxis against metastatic infection.
Misconceptions:

- Patients with obvious odontogenic infection should not be touched until it resolved via antibiotic therapy.

- All infections, by definition, require antibiotic administration.
Three factors must be considered:

- The seriousness of the infection.
- Whether adequate surgical treatment can be achieved.
- The state of the patient’s host defenses.
Indications of antibiotic prescription:

- Presence of an acute-onset infection with diffuse swelling and moderate-to-severe pain.
- Any type of infection in patient who is immunologically compromised.
Indications of antibiotic prescription:

- The presence of an infection that has progressed to involvement of the deep fascial spaces.
- Trismus.
- Severe pericoronitis.
Indications of antibiotic prescription:

- Temperature higher than 38.3°C.
- Lymphadenopathy.
Antibiotic therapy is not indicated in:

- Minor, chronic, well-localized abscess.
- Localized alveolar osteitis (dry socket).
- Mild pericoronitis with minor gingival edema and mild pain.
- Multiple dental extractions in an immuno-competent patient.
Antibiotic therapy protocol:

- Use empirical therapy routinely.
- Use the antibiotic with the lowest incidence of toxicity and side effects.
- Use a bactericidal antibiotic, if possible.
- Be aware of the cost of antibiotics.
Proper antibiotic prescription:

- Proper dose.

The peak plasma level of the drug should usually be at least four or five times the minimal inhibitory concentration for the bacteria involved in the infection.
Proper antibiotic prescription:

- Proper dose.

- Consideration should be given to administering an initial loading dose of an antimicrobial as the first dose.
Proper antibiotic prescription:

Proper interval.

This is determined by the plasma half-life of the drug.
Proper antibiotic prescription:

- High compliance.

The degree to which a patient correctly follows medical advice regarding the drug.
Proper antibiotic prescription:

- Adequate period.

✓ 2 to 3 days after the infection has resolved.
Failure of antibiotic therapy:

- Patient noncompliance.
- Inadequate surgery.
- Drug dose too low.
- Wrong identification of bacteria.
- Wrong antibiotic.
Commonly used antibiotics:

Microbiology of odontogenic infection:

- Aerobic gram-positive cocci.
  - *Streptococcus milleri* group.
- Anaerobic gram-positive cocci.
  - Anaerobic *Streptococcus* & *Peptostreptococcus*.
- Anaerobic gram-negative rods.
  - *Prevotella* and *Porphyromonas* spp. & *fusibacterium*. 
Commonly used antibiotics:

Effective antibiotics:

- **Penicillins.**
  - Penicillin, ampicillin and amoxicillin.
  - Bactericidal.
  - Effective against aerobic and anaerobic pathogens.
  - Prevotella Porphyromonas and Fusobacterium may exhibit resistance.
Commonly used antibiotics:

Effective antibiotics:

Cephalosporins.

- Bactericidal.
- Effective against aerobic and less effective to anaerobic pathogens.
Commonly used antibiotics:

Effective antibiotics:

- Lincosamides.
  - Clindamycin.
  - Bacteriostatic.
  - Increased activity against anaerobic bacteria.
  - Increased diffusion in bony tissues.
  - Pseudomembranous colitis in 20% of patients.
Commonly used antibiotics:

Effective antibiotics:

- **Macrolides.**
  - Clarithromycin & azithromycin.
  - Bacteriostatic.
  - Decreased activity against Prevotella, Porphyromonas and Fusobacterium.
Commonly used antibiotics:

Effective antibiotics:

Nitroimidazoles.

- Metronidazole, Ornidazole & Tinidazole
- Excellent activity against anaerobic gram negative bacilli.
- Decreased or no effect on against anaerobic cocci and facultative aerobic bacteria.
Advantages of prophylaxis:

- Reduction in the incidence of postoperative infection reduces the postoperative morbidity.

- Reduction of the cost of health care.

- Requires a shorter-term administration, rather than therapeutic use.
Disadvantages of prophylaxis:

- May alter host flora.
- Allows antibiotic-resistant organisms to spread to the patient’s family.
- In situations where the risk of infection is so low that the antibiotic does not significantly decrease the incidence of infection.
Disadvantages of prophylaxis:

- May encourage lax surgical and aseptic techniques on the part of the dentist.
- The cost for many surgeries for many patients can be enormous.
- The possibility of toxicity is always present.
Misconception:

Any minor oral surgery need a preoperative dose of prophylactic antibiotic.
Principles of prophylaxis:

- Procedure should have significant risk of infection.
  - Surgery that involves a prolonged procedure.
  - The insertion or presence of a foreign body.
  - Bad oral hygiene.
  - Depressed host defense.
Principles of prophylaxis:

- Choose correct antibiotic.

  ✓ The antibiotic should be effective against the organisms most likely to cause infection in the oral cavity.

  ✓ The antibiotic chosen should be a narrow-spectrum antibiotic.
Principles of prophylaxis:

- Choose correct antibiotic.
  - The antibiotic should be the least toxic antibiotic available for the patient.
  - The drug selected should be a bactericidal antibiotic.
Principles of prophylaxis:

Choose correct antibiotic.

The antibiotic of choice for prophylaxis before oral surgery:

- penicillin or amoxicillin.
- Cephalexin.
- Clindamycin.
- Azithromycin.
Principles of prophylaxis:

Antibiotic plasma level must be high.

- The drug is given in a dose at least two times the usual therapeutic dose.
  - 2 g penicillin or amoxicillin.
  - 2 g cephalexin.
  - 600 mg clindamycin.
  - 500 mg. azithromycin.
Prevention of Wound Infection

Principles of prophylaxis:

- Time antibiotic administration correctly.
  - The time of dosing before surgery varies, depending on the route used:
    - 1 hour for the oral route.
    - Shorter interval with the intravenous route.
  - If the surgery is prolonged an additional antibiotic dose is required.
Principles of prophylaxis:

❖ Use shortest antibiotic exposure that is effective.

✓ Once the surgical procedure is completed, continued antibiotic administration produces little or no benefit.
Infective Endocarditis

Misconception:

All cardiac patients, by definition, require antibiotic administration before any dental treatment.
**Infective Endocarditis**

- **AHA Classification of the cardiac patients**

<table>
<thead>
<tr>
<th>Cardiac Conditions Associated with the Highest Risk to IE</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Prosthetic cardiac valve</td>
</tr>
<tr>
<td>▪ Previous infective endocarditis</td>
</tr>
<tr>
<td>▪ Congenital heart disease (CHD):</td>
</tr>
<tr>
<td>o Unrepaired cyanotic CHD.</td>
</tr>
<tr>
<td>o Completely repaired congenital heart defect (during the first 6 months after the procedure)</td>
</tr>
<tr>
<td>o Repaired CHD with residual defects.</td>
</tr>
<tr>
<td>▪ Cardiac transplant recipients who have cardiac valvulopathy</td>
</tr>
</tbody>
</table>
**Infective Endocarditis**

- ADA categorization of the dental procedures.

<table>
<thead>
<tr>
<th>Dental Procedures for Which IE Prophylaxis Is Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Minor oral surgeries.</td>
</tr>
<tr>
<td>▪ Dental extraction.</td>
</tr>
<tr>
<td>▪ Periodontal procedures.</td>
</tr>
<tr>
<td>▪ Placement of orthodontic bands.</td>
</tr>
<tr>
<td>▪ Interligammentary LA.</td>
</tr>
</tbody>
</table>
## Infective Endocarditis

- ADA categorization of the dental procedures.

<table>
<thead>
<tr>
<th>Dental Procedures for Which IE Prophylaxis Is Not Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Restorative dentistry.</td>
</tr>
<tr>
<td>▪ Routine LA injection.</td>
</tr>
<tr>
<td>▪ Endodontic therapy using rubber dam.</td>
</tr>
<tr>
<td>▪ Suture removal.</td>
</tr>
<tr>
<td>▪ Placement of removable appliances.</td>
</tr>
<tr>
<td>▪ Making of impressions.</td>
</tr>
<tr>
<td>▪ Orthodontic appliance adjustment.</td>
</tr>
<tr>
<td>▪ Shedding of primary teeth.</td>
</tr>
</tbody>
</table>
### Infective Endocarditis

#### Antibiotic regimen.

<table>
<thead>
<tr>
<th>Route</th>
<th>Patient</th>
<th>Drug</th>
<th>Adult</th>
<th>Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>No allergy</td>
<td>Amoxicillin</td>
<td>2 g</td>
<td>50 mg/Kg</td>
</tr>
<tr>
<td></td>
<td>Penicillin allergy</td>
<td>Cephalexin, Clindamycin</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Azithromycin, clarithromycin</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 g 600 mg 500 mg</td>
<td></td>
<td>50 mg./Kg. 20 mg./Kg. 15 mg/Kg</td>
</tr>
<tr>
<td>Parenteral</td>
<td>No Penicillin allergy</td>
<td>Ampicillin, Cefazolin, Ceftriaxone</td>
<td>2 g 1 g</td>
<td>50 mg/Kg</td>
</tr>
<tr>
<td></td>
<td>Penicillin allergy</td>
<td>Cefazolin, Ceftriaxone</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clindamycin 600 mg</td>
<td></td>
<td>50 mg/Kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 mg/kg</td>
<td></td>
<td></td>
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</tbody>
</table>
THANK YOU