

Guideline on Appropriate Use of Antibiotic Therapy for Pediatric Dental Patients

Originating Council

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Purpose

The American Academy of Pediatric Dentistry (AAPD) recognizes the increasing prevalence of antimicrobial-resistant microorganisms. This guideline is intended to provide guidance in the proper and judicious use of antibiotic therapy in the treatment of oral conditions.¹

Methods

This guideline is based on a review of current dental and medical literature pertaining to the use of antibiotic therapy in the treatment of oral conditions. A MEDLINE search was conducted using the keywords “antibiotic therapy”, “antibacterial agents in children”, “dental trauma”, “oral wound management”, and “orofacial infections”.

Background

The widespread use of antibiotics has permitted common bacteria to develop resistance to drugs that once controlled them.²⁻⁴ Several studies have shown that children recently treated with an antibiotic are more likely to be colonized with bacteria resistant to that antibiotic. At present, there are no antibiotics to which resistance has not appeared.^{2,5} To diminish the rate at which resistance is increasing, health care providers must be prudent in the use of antibiotics.

Recommendations

Conservative use of antibiotics is indicated to minimize the risk of developing resistance to current antibiotic regimens.²⁻¹¹ The following general principles should be adhered to when prescribing antibiotics for the pediatric population.

Oral wound management

Oral wounds are associated with an increased risk of bacterial contamination, as 1 mL of saliva contains 10⁸⁻⁹ bacteria.¹² Based upon the amount of bacterial contamination, wounds can be classified as clean, potentially contaminated, or contaminated/

dirty. If the insult to the oral cavity/dentition appears to have been contaminated by extrinsic bacteria, antibiotic therapy should be considered. If it is determined that antibiotics would be beneficial to the healing process, the timing of the administration of antibiotics is critical to supplement the natural host resistance in bacterial killing. The drug should be administered as soon as possible for the best result. The most effective route of drug administration (intravenous vs intramuscular vs oral) must be considered. The clinical effectiveness of the drug must be monitored. If the infection is not responsive to the initial drug selection, a culture and susceptibility testing of isolates from the infective site may be indicated. The minimal duration of drug therapy should be limited to 5 days beyond the point of substantial improvement or resolution of signs and symptoms; this is usually a 5- to 7-day course of treatment dependent upon the specific drug selected.¹³⁻¹⁷ The importance of completing a full course of antibiotic must be emphasized. If the patient discontinues the antibiotic prematurely, the surviving bacteria can restart an infection that may be resistant to the original antibiotic. Examples of oral wounds are: (1) soft tissue laceration; (2) complicated crown fracture (ie, pulp exposure); (3) severe tooth displacement; (4) extensive gingivectomy; or (5) severe ulcerations.

Special conditions

Pulpitis/apical periodontitis/draining sinus tract/localized intra-oral swelling

Bacteria can gain access to the pulpal tissue through caries, exposed pulp or dentinal tubules, cracks into the dentin, and defective restorations. If a child presents with acute symptoms of pulpitis, treatment (ie, pulpotomy, pulpectomy, or extraction) should be rendered. Antibiotic therapy usually is not indicated if the dental infection is contained within the pulpal tissue or the immediately surrounding tissue. In this case, the child will have no systemic signs of an infection (ie, no fever and no facial swelling).^{14,16}

Acute facial swelling of dental origin

A child presenting with a facial swelling secondary to a dental infection should receive immediate dental attention. Depending on clinical findings, treatment may consist of treating or extracting the tooth/teeth in question with antibiotic coverage or prescribing antibiotics for several days to contain the spread of infection and then treating the involved tooth/teeth. The clinician should consider the ability to obtain adequate anesthesia, the severity of the infection, and the medical status of the child. Intravenous antibiotic therapy and/or referral for medical management may be indicated.¹⁶

Dental trauma

Local application of an antibiotic to the root surface of an avulsed tooth has been recommended to reduce root resorption and increase the rate of pulpal revascularization.¹⁸⁻²² Systemic antibiotics have been recommended as an adjunctive therapy to the recovery of a severely injured tooth/teeth. The value of systemic antibiotics in oral wound healing, however, remains unclear.¹⁸

Pediatric periodontal diseases

In pediatric periodontal diseases (eg, neutropenias, Papillon-LeFevre syndrome, leukocyte adhesion deficiency), the immune system is unable to control the growth of periodontal pathogens, thus necessitating antibiotic therapy. Culture and susceptibility testing of isolates from the involved sites are helpful in guiding the drug selection. Prolonged antibiotic therapy may be indicated in the management of chronic periodontal disease, especially if the underlying immunodeficiency is not corrected. Subsequent cultures are beneficial in determining the timing of the endpoint of antibiotic therapy.²³

Viral diseases

Conditions such as acute primary herpetic gingivostomatitis should not be treated with antibiotic therapy unless there is strong evidence to indicate that a secondary bacterial infection exists.²⁴

Oral contraceptive use

Whenever an antibiotic is prescribed to a female patient taking oral contraceptives to prevent pregnancy, the patient must be advised to use additional techniques of birth control during antibiotic therapy and for at least 1 week beyond the last dose, as the antibiotic may render the oral contraceptive ineffective.^{25,26}

References

1. Dajani AS, Taubert KA, Wilson W, et al. Prevention of bacterial endocarditis: Recommendations by the American Heart Association. *JAMA* 1997;227:1794-801.
2. Levy SB. Multidrug resistance: A sign of the times. *N Engl J Med* 1998;338(19):1376-8.
3. Neu HC. The crisis in antibiotic resistance. *Science* 1992;257(5073):1064-73.
4. Tenover FC, Hughes JM. The challenges of emerging infectious diseases. *JAMA* 1996;275(4):300-4.
5. American Academy of Pediatrics, CDC, American Society for Microbiology. Your child and antibiotics: Unnecessary antibiotics can be harmful. Atlanta, Ga: CDC; 1997.
6. CDC, Food and Drug Administration, National Institutes of Health. Action plan to combat antimicrobial resistance 1999. Available at: "http://www.cdc.gov/drugresistance/actionplan/index.htm". Accessed February 25, 2005.
7. Dowell SF, Marcy SM, Phillips WR, Gerber MA, Schwartz B. Principles of judicious use of antimicrobial agents for pediatric upper respiratory tract infectious. *Pediatrics* 1998;101:163-5.
8. Finkelstein JA, Metlay JP, Davis RL, Rifas-Shiman SL, Dowell SF, Platt R. Antimicrobial use in defined populations of infants and young children. *Arch Pediatr Adolesc Med* 2000;154(4):395-400.
9. O'Brien KL, Dowell SF, Schwartz B, Marcy M, Phillips WR, Gerber MA. Acute sinusitis: Principles of judicious use of antimicrobial agents. *Pediatrics* 1998;101:174-7.
10. Schwartz B, Bell DM, Hughes JM. Preventing the emergence of antimicrobial resistance: A call to action by clinicians, public health officials, and patients. *JAMA* 1997;278(11):944-5.
11. Williams RJ, Heymann DL. Containment of antibiotic resistance. *Science* 1998;279(5354):1153-4.
12. Becker GD. Identification and management of the patient at high risk for wound infection. *Head Neck Surg* 1986;8(3):205-10.
13. Wickersham RM, Novak KK, Schweain SL, et al. Systemic anti-infectives. In: *Drug Facts and Comparisons*. St. Louis, Mo: Facts and Comparisons; 2004:1217-336.
14. Johnson BS. Oral infection: Principles and practice of antibiotic therapy. *Infect Dis Clin North Am* 1999;13(4):851-70.
15. Kuriyama T, Karasawa T, Nakagawa K, Saiki Y, Yamamoto E, Nakamura S. Bacteriological features and antimicrobial susceptibility in isolates from orofacial odontogenic infections. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2000;90(5):600-8.
16. Peterson LJ. Antibiotics for oral and maxillofacial infections. In: Newman MG, Kornman KS, eds. *Antibiotic/Antimicrobial Use in Dental Practice*. St. Louis, Mo: Mosby; 1990:159-71.
17. Prieto-Prieto J, Calvo A. Microbiological basis of oral infections and sensitivity to antibiotics. *Med Oral Patol Oral Cir Bucal* 2004;9(suppl S):11-8.
18. Andreasen JO, Andreasen FM. Avulsions. In: *Textbook and Color Atlas of Traumatic Injuries to the Teeth*. 3rd ed. Copenhagen, Denmark: Munksgaard Publishers; 1994:383-425.
19. Cvek M, Cleaton-Jones P, Austin J, Kling M, Lownie J, Fatti O. Effect of topical application of doxycycline on pulp revascularization and periodontal healing in reimplanted monkey incisors. *Endod Dent Traumatol* 1990;6(4):170-6.
20. Krasner P, Rankow HJ. New philosophy for the treatment of avulsed teeth. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1995;79(5):616-23.

21. Lee JY, Vann WF, Sigurdson AS. Management of avulsed permanent incisors: A decision analysis based on changing concepts. *Pediatr Dent* 2001;23(4):357-60.
22. Trope M. Treatment of the avulsed tooth. *Pediatr Dent* 2000; 22(2):145-7.
23. Delaney JE, Keels MA. Pediatric oral pathology: Soft tissue and periodontal conditions. *Pediatr Clin North Am* 2000;47(5):1125-47.
24. American Academy of Pediatrics. Herpes simplex. In: *Red Book: 2003 Report of the Committee on Infectious Diseases*. 26th ed. Elk Grove Village, Ill: American Academy of Pediatrics; 2003:344-53.
25. DeRossi SS, Hersh EV. Antibiotics and oral contraceptives. *Pediatr Clin North Am* 2002;46(4):653-64.
26. Burroughs KE, Chambliss ML. Antibiotics and oral contraceptive failure. *Arch Fam Med* 2000;9(1):81-2.