Journal of Oral Research

EDITORIAL

DOI: *10.17126/joralres.2016.048*

Improving antibiotics prescription habits in the treatment of odontogenic infections.

Odontogenic infections are polymicrobial infections of periodontal and endodontic origin. These conditions are known to be caused by a combination of gram-positive, gram-negative, facultative anaerobes and strict anaerobic bacteria.[1] Evidence suggests that most odontogenic infections can be successfully treated without the use of systemic antibiotics, removing the source of infection by means of periodontal or endodontic procedures, abscess drainage, or tooth extraction. However, if systemic involvement or a rapid and diffuse spread of infection are detected, antibiotics must be prescribed as an adjunct to periodontal or endodontic treatment. In dentistry, systemic antibiotics should only be used in cases of persistent or systemic infections, or when performing dental treatments in immunocompromised patients.[2] Nevertheless, since 1928, after the discovery of penicillin by Alexander Fleming, the use of antibiotics has become a common practice in dental treatments. Furthermore, second to analgesics, antibiotics are currently the drugs most frequently prescribed by dental care providers.

The appearance of resistant bacterial strains is a health problem at global scale. Since 10% of all common antibiotics are being prescribed by dentists, their contribution to antimicrobial resistance could be significant.[3] Therefore, the rational and appropriate use of antibiotics in the treatment of odontogenic infections should be considered a priority among dental care professionals. Prescription of antibiotics must be based on objective evidence and not influenced by patient demand, opinions of referring dentists, "just in case" situations, or because the dental emergency occurs the day before a weekend or holiday. Several reports provide evidence of inadequate antibiotic prescribing practices by dentists for a number of reasons, ranging from inadequate knowledge to social factors.[4] Some endodontists admitted feeling compelled to prescribe antibiotics for "medical-legal" reasons and to reduce the risk of losing referrals.[5]

Several surveys have been designed to collect information about the conditions in which antibiotics are prescribed. A survey carried out in Spain[6] revealed that some dentists prescribe antibiotics inappropriately to treat irreversible pulpitis (40% of respondents had prescribed antibiotics), in cases of a necrotic pulp, acute apical periodontitis, and no swelling (53% of the respondents had prescribed antibiotics) and for necrotic pulps with chronic apical periodontitis and a sinus tract (22% of the professionals had prescribed antibiotics). Another survey carried out among Spanish oral surgeons[7] showed that 86% of the respondents prescribed antibiotics in case of irreversible pulpitis (86%) and in cases of necrotic pulp, acute apical periodontitis and no swelling (71%). In the USA, a study carried out among members of the AAE revealed that the majority of endodontists were selecting the appropriate antibiotic for the treatment of orofacial infections, but many were prescribing antibiotics inadequately.[5] A survey carried out in India[8] showed that antibiotics were prescribed in cases of irreversible pulpitis and acute apical periodontitis (72%), necrotic pulp, acute apical periodontitis and no swelling (59%), concluding that most of the oral healthcare providers (92%) overprescribed antibiotics.

These data show that dentists are overprescribing antibiotics for the management of endodontic infections because of inadequate knowledge. Systemically healthy patients suffering from irreversible pulpitis with moderate to severe symptoms, with or without localized swelling and acute apical periodontitis, is a non-indicated condition for antibiotic prescription, but a high percentage of dentists prescribe antibiotics in these situations[6,7,9]. Some dentists prescribe antibiotics thinking that pain will be better controlled. Scientific evidence about antibiotic usage for endodontic infections and pain has been recently analyzed in a systematic review, concluding that clinical evidence supports the prescription of antibiotics for the treatment of endodontic diseases only when the spread of infection is systemic, patient is febrile or immunocompromised, or both.[10]

Which conditions justify the use of systemic antibiotics in the treatment of odontogenic infections? There are few real indications for the systemic use of antibiotics in odontogenic infections, because they are only needed when the body's efforts at fighting bacteria are failing,[2] such as in the following four situations: 1) Acute apical or periodontal abscesses with localized fluctuant swellings in medically compromised patients with systemic disease causing impaired immunologic function. 2) Acute apical or periodontal abscesses with localized fluctuant swellings and systemic involvement (high fever, malaise, lymphadenopathy, trismus). 3) Progressive odontogenic infections with rapid onset of severe infection (less than 24h), cellulitis or spreading infection, and osteomyelitis. 4) Persistent chronic odontogenic infections with exudation, not resolved by regular endodontic and/or periodontal therapy. In all these situations, systemic antibiotics must be prescribed to prevent infection via lymph and blood circulation. The case of necrotic pulp, acute apical periodontitis (abscess), swelling, and moderate to severe symptoms, could also be considered as indicators of systemic involvement; in this situation, root canal treatment, incision and drainage, should be complemented with antibiotics.

On the contrary, which odontogenic infections do not require systemic antibiotics? Irreversible pulpitis, pulp necrosis, localized acute apical abscess with no systemic involvement and chronic apical abscess with sinus tract, are all situations that only need normal root canal treatment, if tooth is restorable. In these cases, blood circulation into the root canal is partially or completely compromised, preventing antibiotics from reaching the affected area. Systemic antibiotic administration in these cases is ineffective in eliminating the intracanal infection causing the disease. It can be concluded that it is necessary to improve antibiotic prescription habits in the treatment of odontogenic infections at a global scale. Educational initiatives must be implemented to encourage the rational and appropriate use of antibiotics in dentistry.

JUAN JOSÉ SEGURA-EGEA. MD PhD DDS
Facultad de Odontología.
Universidad de Sevilla, España.

REFERENCES.

1. Siqueira JF Jr, Rôças IN, Silva MG. Prevalence and clonal analysis of Porphyromonas gingivalis in primary endodontic infections. J Endod. 2008;34(11):1332–6.
2. Mohammadi Z. Systemic, prophylactic and local applications of antimicrobials in endodontics: an update review. Int Dent J. 2009;59(4):175–86.
3. Pallasch TJ. Global antibiotic resistance and its impact on the dental community. J Calif Dent Assoc. 2000;28(3):215–33.
4. Oberoi SS, Dhingra C, Sharma G, Sardana D. Antibiotics in dental practice: how justified are we. Int Dent J. 2015;65(1):4–10.
5. Yingling NM, Byrne BE, Hartwell GR. Antibiotic use by members of the American Association of Endodontists in the year 2000: report of a national survey. J Endod. 2002;28(5):396–404.
6. Rodriguez-Núñez A, Cisneros-Cabello R, Velasco-Ortega E, Llamas-Carreras JM, Tórres-Lagares D, Segura-Egea JJ. Antibiotic use by members of the Spanish Endodontic Society. J Endod. 2009;35(9):1198–203.
7. Segura-Egea JJ, Velasco-Ortega E, Torres-Lagares D, Velasco-Ponferrada MC, Monsalve-Guil L, Llamas-Carreras JM. Pattern of antibiotic prescription in the management of endodontic infections amongst Spanish oral surgeons. Int Endod J. 2010;43(4):342–50.
8. Garg AK, Agrawal N, Tewari RK, Kumar A, Chandra A. Antibiotic prescription pattern among Indian oral healthcare providers: a cross-sectional survey. J Antimicrob Chemother. 2014;69(2):526–8.
9. Fedorowicz Z, van Zuuren EJ, Farman AG, Agnihotry A, Al-Langawi JH. Antibiotic use for irreversible pulpitis. Cochrane Database Syst Rev. 2013;(12):CD004969.
10. Aminoshariae A, Kulild JC. Evidence-based recommendations for antibiotic usage to treat endodontic infections and pain: A systematic review of randomized controlled trials. J Am Dent Assoc. 2016;147(3):186–91.