

Antibiotic Prophylaxis in Dental Implants: A Review

Vijay Ebenezer¹, Balakrishnan Ramalingam², Bhagyasree Nair³

¹Professor and Head of the Department, ²Professor, ³Post Graduate Trainee, Department of Oral and Maxillofacial Surgery, Sree Balaji Dental College and Hospital, Pallikaranai

Abstract

Introduction: Dentists are often faced with the tough decision of whether to prescribe prophylactic antibiotics for complex oral surgeries such as dental implants. Although these decisions are generally made on a case by case basis, if antibiotics were improperly prescribed, it would produce a greater difficulty in treating infections.

Materials and Methods: Antibiotics are used to prevent infections. If a dental implant does become infected, the chances of implant failure become high. While a huge number of factors can ultimately lead to the failure of dental implants, most of us take extra precautions regarding infection.

Generally, Amoxicillin and Penicillins are prescribed as first line of treatment, due to their superior absorption rate and prolonged serum levels. In today's population, however, there is increased levels of penicillin allergies. In such cases, Clindamycin is used as an alternate with excellent results. The use of antibiotics in implant dentistry is controversial. While, pre-operational standard guidelines regarding antibiotics are possible to form; however, post-operational will need to be based on procedural outcomes during, and after completion of the operation.

Conclusion: The non-evidence-based practice protocol of prescribing prophylactic antibiotics raises serious ethical concerns. Surgeons and general practitioners are routinely placing implants with antibiotics perhaps due to the fact that they are fearful of the repercussions of implant failure. The negative impacts associated with use of antibiotic therapy must be assessed in comparison to the costs and morbidity. The dental professionals must be careful, to not only prescribe antibiotics only when necessary, but also work towards performing implant procedures with utmost care and importance given to sterilization and a maintenance of aseptic conditions before and during the procedure.

Keywords: Antibiotics, Amoxicillin, Penicillins, Clindamycin.

Introduction

Dentists are often faced with the tough decision of whether to prescribe prophylactic antibiotics for complex oral surgeries such as dental implants. Although these decisions are generally made on a case by case basis, if antibiotics were improperly prescribed, it would produce a greater difficulty in treating infections.

A study that was done in 2000 revealed that 40% of dentist prescribed antibiotics to patients with no relevant medical history as a contingency for infection. It is crucial that appropriate case specific guidelines are available for the use of prophylactic antibiotics.

Materials and Methods

Antibiotics are used to prevent infections. If a dental implant does become infected, the chances of implant failure become high. While a huge number of factors can ultimately lead to the failure of dental implants, most of us take extra precautions regarding infection.

Early implant failure has been associated with certain strains of bacteria including streptococci, anaerobic Gram-positive cocci, and anaerobic gram-negative rods. The antibiotic of choice for the prevention of delayed wound healing should be bactericidal and have low toxicity.

Generally, Amoxicillin and Penicillins are prescribed as first line of treatment, due to their superior absorption rate and prolonged serum levels. In today's population, however, there is increased levels of penicillin allergies. In such cases, Clindamycin is used as an alternate with excellent results.

The use of antibiotics in implant dentistry is controversial. Major concerns associated with the widespread use of antibiotics is the evolution of antibiotic resistant bacteria. There is dear that the routine use of antibiotics may lead to lax surgical techniques and actually increase the rate of complications.

Currently, only high and some moderate risk category patients are suggested for prophylactic antibiotic therapy during dental implants.

While, pre-operational standard guidelines regarding antibiotics are possible to form; however, post-operational will need to be based on procedural outcomes during, and after completion of the operation.

There is a general consensus amongst dental practitioners and clinicians that antibiotics are overused. Some alternative methods to lower the risk of infection, and reduce use of antibiotics include the use of Chlorhexidine digluconate (CHX), a mouthwash rinse. CHX, when used as a preoperative rinse, has proven to be efficient aid in promoting healing and reducing other surgical complications that may occur.

Lambert, et al. (1997) found that the infectious complications which lead to implant failure were more likely to occur during the closed healing period. CHX rinse, therefore, has been proven to be an effective alternative in reducing infectious complications from implant surgery when routinely used.

Other factors that affect the success rates of implants are intraoperative management, skill of the surgeon, and the patient's medical status. Early

loading of the implant, lack of sufficient alveolar bone, and patient factors such as hygiene levels, use of alcohol and tobacco, all increase the chances of postoperative infection.

Conclusion

The non-evidence-based practice protocol of

prescribing prophylactic antibiotics raises serious ethical concerns. Surgeons and general practitioners are routinely placing implants with antibiotics perhaps due to the fact that they are fearful of the repercussions of implant failure. The cost-benefit ratio of any therapy, including all potential adverse effects, must be determined.

Use of antibiotics is reported to reduce the infection rate, but inappropriate and non-judicious antibiotic administration can lead to side effects. Side effects are complications associated with Gastrointestinal System, resistant bacteria, secondary infection, antibiotic toxicity, and adverse reaction. Some other, more serious side effects are anaphylactic reactions and pseudomembranous colitis.

Hypersensitivity reactions can range from mild to fatal. Mild reactions include cutaneous eruptions such as rashes, urticaria, or exfoliate dermatitis. Another complication that may be seen with antibiotics is serum sickness, an immune complex condition. The most severe form of hypersensitivity is immediate hypersensitivity including anaphylaxis, laryngeal edema, or brochospasm.

These may eventually lead to the death of the individual, if appropriate treatment is not given to the patient at the right time.

The negative impacts associated with use of antibiotic therapy must be assessed in comparison to the costs and morbidity. The dental professionals must be careful, to not only prescribe antibiotics only when necessary, but also work towards performing implant procedures with utmost care and importance given to sterilization and a maintenance of aseptic conditions before and during the procedure.

Ethical Clearance – Not required since it is a review article

Source of Funding – Nil

Conflict of Interest – Nil

References

1. Haas DA, Epstein JB, Eggert FM. Antimicrobial resistance: dentistry's role. J Can Dent Assoc. 1998;64(7):496- 502.

2. Palmer NO, Martin MV, Pealing R, Ireland RS. An analysis of antibiotic prescriptions from general dental practitioners in England. *J Antimicrob Chemother.* 2000;46(6):1033-1035.
3. Canadian Dental Association. CDA Position on antibiotic prophylaxis for dental patients at risk. *CDA-ADC Journal* 2005.
4. Lawler B, Sambrook PJ, Goss AN. Antibiotic prophylaxis for dentoalveolar surgery: is it indicated? *Aust Dent J.* 2005;50(4 Suppl 2):S54-59.
5. Beikler T, Flemmig TF. Implants in the medically compromised patient. *Crit Rev Oral Biol Med.* 2003;14(4):305-316.
6. Antolin A, Garcia M, Nasimi A. Infections in implantology: from prophylaxis to treatment. *Med Oral Patol Oral Cir Cubbal* 2007; 12: 323-330.
7. Mombelli A. Microbiology of the dental implant. *Adv Dent Res.* 1993;7(2):202-206.
8. Jovanovic SA, James RA, Lessard G. Bacterial morphotypes and PGE2 levels from the perigingival site of dental implants with intact and compromised bone support. *J Dent Res* 1988; 67: 28.
9. Lekholm U, Ericsson I, Adell R, Slots J. The condition of the soft tissues at tooth and fixture abutments supporting fixed bridges. A microbiological and histological study. *J Clin Periodontol.* 1986;13(6):558-562.
10. Mombelli A, Marxer M, Gaberthuel T, Grunder U, Lang NP. The microbiota of osseointegrated implants in patients with a history of periodontal disease. *J Clin Periodontol.* 1995;22(2):124-130.
11. Naert I, Quirynen M, van Steenberghe D, Darius P. A study of 589 consecutive implants supporting complete fixed prostheses. Part II: Prosthetic aspects. *J Prosthet Dent.* 1992;68(6):949-956.
12. Laskin DM, Dent CD, Morris HF, Ochi S, Olson JW. The influence of preoperative antibiotics on success of endosseous implants at 36 months. *Ann Periodontol.* 2000;5(1):166-174.
13. Dajani AS, Taubert KA, Wilson W, Bolger AF, Bayer A, Ferrieri P, Gewitz MH, et al. Prevention of bacterial endocarditis. Recommendations by the American Heart Association. *Circulation.* 1997;96(1):358-366.
14. Ziment I. Complications of antibiotic therapy. *Calif Med.* 1972;117(5):24-48.
15. Esposito M, Coulthard P, Oliver R, Thomsen P, Worthington HV. Antibiotics to prevent complications following dental implant treatment. *Cochrane Database Syst Rev.* 2003(3):CD004152.