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A review on a use of Augmentin in Root Canal Infection/Odontogenic infections

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Abstract

Bacterial invasion is the primary cause of endodontic infections or root canal infections [19]. In cases of endodontic infections, dentists frequently prescribe antibiotics. Dentists have been prescribing amoxicillin for oral infections since the 1970s. It is most frequently used in conjunction with clavulanic acid. The purpose of this study is to gather knowledge on the antibiotic Amoxicillin in combination with clavulanic acid (Augmentin) in order to support accurate assessment and management [30]. According to the PRISMA recommendations, a systematic review of the literature has been done. A manual search was conducted in the databases of PubMed, Embase, Scopus, Cochrane, and Web of Science. The author, year, sample, and antibiotic used were taken out of the chosen research (dosage, direction of use, its application in root canal infection, and side effects).

Key words :- Augmentin, endodontist, potassium clavulanate

Introduction :-

Teeth are not totally solid; instead, they are composed of layers. The hard outer covering of the tooth is referred to as the enamel. The inner layer is known as dentin, and it is a permeable, almost sponge-like tissue. In the centre of each tooth is pulp, a collection of soft tissue. The pulp contains the nerves and blood vessels necessary for the tooth to emerge. Odontoblasts, which are cells that keep the tooth healthy, are packed inside. [20]

During a root canal, the pulp of a tooth that has been infected or affected by tooth decay or other issues is removed. Root canal treatment is thought to be generally safe and effective at saving teeth. Although root canal infections are rare, there is a small chance that a tooth could get infected. After a root canal therapy, some discomfort is typical. You may have pain and tightness for a few days following therapy. For a week after, you might feel only mildly sore [17].

In particular, if the discomfort is similar to or worse than it was before the procedure, consult your dentist if you feel severe pain for more than a week after the procedure. There are times when a tooth with no

discomfort for some time develops a delayed root canal infection. A tooth that has undergone a root canal procedure may not heal completely and may continue to hurt or deteriorate months or even years after the procedure.

Dentists recommend Augmentin in this situation to prevent deterioration and disruption of recovery [1]. A prescription antibiotic drug is Augmentin. It is employed to treat bacterial infections. The antibiotic group that includes penicillin includes Augmentin. Amoxicillin and clavulanic acid are two medicines that are present in Augmentin. Augmentin has a wider range of antibacterial activity than medications that only include amoxicillin.

Local endodontic applications

Antibiotics can be utilized in endodontics in a number of ways. The first endodontist to employ local antibiotic treatments was Grossman, known as the "Father of Endodontics." In 1951, he proposed the poly antibiotic paste combination (PBSC), which contained penicillin, bacitracin, streptomycin, and caprylate sodium
suspended in silicon. Due to the potential of sensitization and allergic responses, the Food and Drug Administration later prohibited the use of PBSC for endodontic procedures in 1975. [2-6]

The Case for Systemic Antibiotics

Endodontic infections are mostly polymicrobial in nature, with anaerobic bacteria and, to a lesser extent, facultative anaerobes playing a role [7]. The harmful effects of these bacteria cause pulpal inflammation, which eventually leads to pulp necrosis, which becomes a reservoir of infection [8]. When dead microbes and their noxious products enter the periapex, they cause irritation of the periapical region, which results in periarticular inflammation, which leads to abscess and cellulitis. In such cases, the rationale for using locally used antibiotics in conjunction with systemic antibiotics is critical. Antibiotics are required in endodontics to aid in the host defence in the elimination of bacteria [9]. Because of the risks associated with broad spectrum antibiotics, narrow spectrum antibiotics should be used first. Antibiotics are required in endodontics to aid in the host defence in the elimination of bacteria. Because broad spectrum antibiotics result in antibiotic sensitivity, narrow spectrum antibiotics should be used first. When there is systemic infection involvement, such as fever, cellulitis, lymphadenopathy, and swelling, systemic antibiotics are indicated [21-23]. Antibiotic prophylaxis to prevent infective endocarditis, prosthetic joint infection, and prophylactic coverage after a sodium hypochlorite accident are also indications for antibiotic use. [12]

Application of Augmentin in endodontic infections/Root Canal infections

Penicillin antibiotics include Augmentin. Amoxicillin and potassium clavulanate are combined in it. The antibiotic class known as penicillin's includes amoxicillin. Amoxicillin attacks and eradicates microorganisms at the periapical region due to abscess formation. Since clavulanate potassium, a kind of clavulanic acid, works very similarly to penicillin in combating bacteria, it can also be used to treat those that are resistant to penicillin and other antibiotics. [9-16]

Pharmacodynamics

Bacterial enzymes that break down the antibiotic before it can work on the infection are the source of resistance to many antibiotics. By inhibiting the β-lactamase enzymes, the clavulanate in Augmentin foresees this defence mechanism, making the organisms susceptible to the amoxicillin's quick bactericidal impact at quantities easily accessible in the body [31]. When combined with amoxicillin to form Augmentin, clavulanate generates an antibiotic agent with broad spectrum activity that is widely used in dental clinical practice.

Pharmacokinetics

The pharmacokinetics of Augmentin's two components are very similar to one another. One hour after oral dosing, both reach their peak serum concentrations. Augmentin is best absorbed at the beginning of a meal.

The serum levels attained by Augmentin are roughly doubled by doubling the dosage.

Amoxicillin and clavulanate both have modest serum binding values; roughly 70% of them stay unbound in the serum. [34]

Dosage

The dosage of Augmentin that your dentist advises will vary depending on a number of factors. These include: your age, the dosage, and any additional health issues that Augmentin may be prescribed to treat. The following text provides descriptions of the dosages that are regularly used or recommended. But be sure to adhere to your dentist's dosage recommendations. Your dentist will choose the dosage that will be most effective for you.

Strengths and forms

Augmentin is available in three different strengths:

250 mg/125 mg, 500 mg/125 mg, 875 mg/125 mg immediate-release tablet;

For the strengths listed above, the first number represents the amount of amoxicillin and the second number represents the amount of clavulanic acid. Because the drugto-drug ratio varies by strength, one strength cannot be substituted for another.

The most common Augmentin dose prescribed by dentists for odontogenetic infections is 500mg/125 mg twice a day for at least 3 days and up to 5 days after meal [33].

Workings of Augmentin Tablet

Augmentin 625 Duo Tablet contains two medications: amoxycillin and clavulanic acid. Amoxycillin is a type of antibiotic. It works by preventing the formation of the bacterial protective layer, which bacteria require to survive. The beta-lactamase inhibitor clavulanic acid increases amoxycillin's antibacterial potency while decreasing resistance.

Side effects of Augmentin

The majority of side effects are insignificant and will disappear as your body adjusts to the medication. Vomiting is a common Augmentin side effect. Diarrhoea and nausea have been observed.

Conclusion

To limit infection spread, they should be used as a supplement in the treatment of acute apical abscesses with systemic involvement, as well as in progressive and persistent infections. In medically compromised patients, endodontic infection complications are more likely. Augmentin should be used as a preventative measure in cases of periapical abscess swelling and as a follow-up treatment after root canal therapy. It should be taken exactly as prescribed by your dentist.

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