



## Review Article

# Use of Antibiotics in Pregnant Women for the Treatment of Dental Infections: A Short Review

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### Abstract

Odontogenic pain is very common among pregnant women. Pregnant patients and their fetuses are more at risk when they experience pain, which frequently comes along with periapical or pulp infections. Therefore, it is crucial to offer adequate pain relief and eradication of the infection for the pregnant woman while maintaining the safety of fetus inside the womb. Antibiotics are used in endodontic treatment; thus, the choice of appropriate and safe antibiotic for pregnant patients is very important. The current study will highlight the antibiotics that can be used in the treatment of dental-related infections during pregnancy.

### Introduction

Pregnant women's oral health is a serious global public health concern. There are well-known risks associated with pregnancy, and it is unquestionable that pregnant women should receive appropriate dental care. When a pregnant woman seeks dental care, there are specific considerations that must be made; as a result, the treatment for these patients may require additional attention in order to speed up the healing process and make adjustments to the dental procedures and medications that are recommended [1]. The mother and fetus' risks should be appropriately assessed. The findings of a recent study on pregnant women revealed that more than 43% of them suffer from dental health issues, including odontogenic infections and discomfort [2].

The majority of odontogenic infections typically progress fast to underlying infections that jeopardize the oropharyngeal airway. Furthermore, discomfort and swelling in the mouth are common signs of dental infections. It is important to remember that odontogenic infections must be always treated swiftly during pregnancy since drug misuse instead of having adequate dental care may have detrimental effects on the pregnant patient and fetus [3]. Endodontic treatment, which involves cleaning and removing the pulp from a patient's teeth, is one of the recommended cures. Radiography, local anesthetic, root cleansing, and intracanal medications such as analgesics and antibiotics are all possible components of root canal therapy (RCT) [4]. Radiography is crucial

during endodontic therapy and is required for accurate diagnosis, adequate blockage, length of work, and assessment after treatment. Pregnant women are thought to be safe since intraoral radiography uses X-rays that are focused on the mouth rather than the abdomen. A protective technique like collimation, high-speed film, a lead apron, and filtering are also used when doing radiography. It is advised that anxious pregnant patients are informed that just the radiographs required for treating and diagnosing them will be taken [5]. Local anesthetic is generally regarded as safe during pregnancy if it is administered correctly and at the prescribed dosage. The general premise is that occasionally it is necessary to provide more anesthesia than usual and that the risks associated with stress are greater than those associated with using more local anesthesia than usual. Epinephrine, a vasoconstrictor, is present in most anesthetics. The local anesthetic has been increased to a maximum dose of 0.1 mg. Despite the use of epidural anesthetic during labor, no adverse effects or anomalies have been documented. It has been documented that intravascular injections of local anesthetic containing epinephrine at the very least reduce placental uterine blood flow. According to reports, for healthy pregnant women, a concentration of 1: 100,000 epinephrine given in dentistry is regarded as safe when combined with the proper aspiration method and kept within the lowest dose possible [6]. RCT is used throughout pregnancy to accomplish objectives such as maintaining a healthy oral environment, managing disease, and preventing potential issues that may occur in the postpartum period or in late

pregnancy. It is believed that none of the endodontic detergents, hypochlorites, or root canal fillers are detrimental to the fetus [7]. Your dentist may also safely recommend certain antibiotics and analgesics as a supplement to endodontic therapy.

### **Acute Disease Management**

Drugs like cephalexin, penicillin, and amoxicillin are recommended as first-line antibiotics in circumstances like mild cellulite. Additionally, erythromycin or clindamycin may be used if a patient has a penicillin allergy. Clindamycin or cephalosporin should be infused intravenously to treat the pregnant patient with severe cellulite. Paracetamol can be administered to relieve toothache. Oxycodone and Ibuprofen can be used under limited circumstances where strong pain relief is warranted [8,9].

### **Safe Dental Procedures During Pregnancy**

First trimester is the crucial time for fetal development. Regardless of whether organogenesis is complete or not, emergency care must be given; if organogenesis is not complete, measures must be taken, and the patient's obstetrician must be consulted. The dentist might create an emergency opening, remove the inflamed pulp, or drain the pus, and suppress the pain if the patient was pregnant. Drugs that can be administered inside the canal root include calcium hydroxide and chlorhexidine/metronidazole. Second trimester is considered the safest time to treat patients. Therefore, both elective and urgent dental care can be given throughout the second trimester. Additionally, procedures like root canal therapy, tooth extraction, and periodontal surgery can be performed. Third trimester is tricky. If the patient has a toothache, immediate treatment can be given. If feasible, definitive treatment should be postponed until after deliveries [8].

### **Crossing the Placenta**

Due to their low molecular weight and a fat solubility, antibiotics can cross the placenta easily. But, it is safer to use oral dosage forms as compared with intravenous route since the first one has lower systemic absorption, and hence, adverse effects [9].

### **Safety of Antibiotics During Pregnancy**

The FDA has categorized antibiotics into five groups based on their pregnancy-related adverse effects as follows:

Category A: Includes those which have been thoroughly studied and have not been linked to any specific pregnancy-related adverse effects.

Category B: While no particular pregnancy-related issues have been reported in humans, negative effects have been reported in animals.

Category C: There is insufficient data on the effects of antibiotics on animals or pregnant women.

Category D: Antibiotics that have side effects but have been shown to be safe during pregnancy, and when used as directed, their benefits outweigh their risks.

Category X: Refers to those which have shown in both human and animal studies that they have more risks than benefits [10].

Based on these classifications, we will go through the common antibiotic agents to describe their role in the treatment of dental-related issues along with their safety according to FDA classes.

#### **1. Penicillins:**

Penicillins are recommended for the treatment of odontogenic infections such as amoxicillin, ampicillin (category B), and penicillin V. The FDA claims that there has been no evidence to date linking the use of amoxicillin during pregnancy to miscarriage, major birth defects, or adverse effects on the fetus or the mother. Amoxicillin and clavulanic acid combination is highly successful in treating severe odontogenic infections. There is no evidence to suggest that taking this combination medicine at therapeutic levels during pregnancy increases the risk of fetal or congenital abnormalities. It is important to note that using this medication during the third trimester increases the risk of a serious condition called necrotizing enterocolitis in the infant. Although there is a low risk of infection overall, this combination medication shouldn't be used during the third trimester of pregnancy [11].

#### **2. Cephalosporins:**

There is no proof that using cephalosporins while pregnant increases the risk of spontaneous abortion or miscarriage. There are conflicting studies regarding the link between antibiotic use during pregnancy and congenital abnormalities in babies. According to findings of a study looking at the effects of cephalosporins, no negative effects were identified. It is important to note that certain investigations confirmed a link between the use of cephalosporin, anorectal atresia, and baby atrial septal insufficiency. However, there is not much of a risk of developing abnormalities [12].

#### **3. Clindamycin:**

Patients who have previously experienced beta-lactam allergy are usually prescribed this medication. Clinical data on the safety of clindamycin are insufficient. Clindamycin use has been linked to congenital anomalies affecting the heart and the musculoskeletal system [13].

#### **4. Metronidazole:**

Metronidazole is typically recommended against anaerobic bacteria in combination with penicillin. Animal studies have raised questions concerning the mutagenic and carcinogenic effects of metronidazole, however human research have shown that no such cases have been observed. It has also been shown

that metronidazole use during pregnancy didn't increase the risk of miscarriage or unfavorable pregnancy outcomes [14].

### 5. Tetracyclines:

All of these agents fall under category D. According to a study, there is a statistically significant link between the usage of tetracycline antibiotics and spontaneous fetal abortion. Tetracycline use has also been shown to cause permanent teeth discoloration in the fetuses. Tetracycline should therefore be avoided during pregnancy unless there is a compelling indication for its use [15].

### 6. Macrolides:

They are typically prescribed to people who have penicillin allergies because they have an antibacterial spectrum similar to penicillin. Macrolides consumption has not been linked to cardiovascular problems in neonates, contradicting earlier theories, according to the new research. However, the use of macrolides during pregnancy has been linked to an increased risk of cerebral palsy-epilepsy, abortion, and GIT problems, according to the findings of a recent study [16].

## Conclusion

In a nutshell, the use of antibiotics to treat dental infections in pregnant women should be limited to those agents that have proven to be safe and effective for the shortest duration possible under the supervision of experienced dentists to avoid the possible harmful effects in the fetuses.

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