

Antibiotics and oral contraceptives in dental practices

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ABSTRACT

Until recently, dentists have been advised to warn women taking the combined oral contraceptive pill of the routine need to use additional contraceptive measures while taking courses of broad-spectrum antibiotics. Recent guidance relating to this issue has changed and dentists may not be aware of this. This paper reminds dentists of the previous guidelines and related evidence on the pharmacokinetics of hormonal contraception.

KEY WORDS: Antibiotics, Contraception, Oral, Pharmacology

INTRODUCTION

In 1994, the British Dental Journal published a paper reviewing the possible interactions between antibiotics and oral contraceptives emphasizing the need for dentists to follow the current national guidelines as part of good dental practice.^[1a,b] At the time, the guidance was that as a dentist you needed to warn the patient that the antibiotics prescribed to them may interfere with the contraceptive effects of the combined oral contraceptive pill (COCP) and that additional contraceptive methods should be used while taking the antibiotics and for 7 days after stopping.^[1] This advice was based on our understanding at the time and further publications reminded dentists of their professional obligations in this area and the possible medicolegal implications of not following current guidance.^[2] Various mechanisms for delivering the advice to patients, including a patient information leaflet, were suggested.

HORMONAL CONTRACEPTION

There are two main types of hormonal contraception - combined hormonal contraceptive and the progestogen-only contraceptive. Combined hormonal contraception contains an estrogen and a progestogen component. When the amount of

estrogen and progestogen is fixed, they are known as “monophasic.” When the amount of hormone varies according to the stage of cycle, they are known as “phasic.”^[3] The estrogen component is usually ethinylestradiol although mestranol and estradiol valerate are sometimes used. The progestogen used can vary and include desogestrel, drospirenone, and gestodene. The estrogen works by stopping ovulation. The progestogen works by thickening the cervical mucus, which prevents the passage of spermatozoa and thinning the endometrial lining, which prevents the implantation of an embryo. This combination prevents pregnancy. Combined hormonal contraception is available as an oral pill, a vaginal ring, and a topical patch. The oral pills may be taken on a 21-day cycle with a 7 days break or taken continuously. The progestogen-only contraceptive is available as an oral pill, an intramuscular injection, and an impregnated intrauterine device. The progestogen-only oral pills are taken on a continuous basis and prevent pregnancy by thickening the cervical mucus and thinning the endometrial lining. They are usually used when estrogens are contraindicated.^[4]

FACTORS AFFECTING THE RELIABILITY OF ORAL CONTRACEPTION INCLUDE

Diarrhea and vomiting can interfere with the absorption of the combined oral contraceptive and progestogen-only contraceptive. If vomiting occurs within 2 h of

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taking the contraceptive pill, another should be taken as soon as possible. Severe persistent diarrhea lasting longer than 24 h means that an additional method of contraception should be used for the duration of illness and for a period of time after recovery.^[5]

Interaction with enzyme-inducing antibiotics: Combined hormonal oral contraceptives usually contain ethinylestradiol as the estrogen component. Oral ethinylestradiol is absorbed from the small intestine and undergoes first-pass metabolism in the liver. Once conjugated with glucuronic acid, it is excreted into the bile and passes into the small and the large intestine. Hydrolytic enzymes produced by bacteria in the large intestine cleave conjugates of ethinylestradiol, which release it to be reabsorbed in the large bowel. These then enter the enterohepatic circulation. The most important hepatic enzyme is cytochrome p-450 mixed function oxidase. Induction of this liver enzyme accelerates the metabolism of ethinylestradiol, which leads to less circulating levels. A reduction in serum levels of ethinylestradiol can lead to reduced efficacy of contraception. Rifampicin-like drugs (for example, rifampicin and rifabutin) are the only antibiotics that are enzyme inducers and have been consistently shown to reduce serum levels of ethinylestradiol.^[6]

Interaction with non-enzyme-inducing antibiotics: Antibiotics that are not enzyme inducers can reduce colonic bacteria and, therefore, theoretically reduce enterohepatic circulation of ethinylestradiol. This could lead to reduction of combined oral contraception efficacy and result in unplanned pregnancy. Progestogen does not undergo enterohepatic recycling and, hence, has not been thought to be affected by antibiotics. This potential interaction, which has been a concern for dental practitioners for many years, has been influential in forming previous guidance and has continued to be reported in publications aimed at dentists.^[7]

ANTIBIOTICS AND DENTISTRY

In 2010, general dental practitioners in England prescribed over 3.8 million items under the infections chapter of the British National Formulary.^[8] A study published in the British Dental Journal in 2011 showed penicillins accounted for 67% of antibacterial drugs prescribed by dentists in Wales. Other antimicrobials prescribed included clindamycin, macrolides, and tetracyclines.^[9] In dentistry, enzyme-inducing antibiotics appear to be only very rarely used if at all; hence, interactions of combined oral contraceptives with enzyme-inducing antibiotics are unlikely to be a problem.

CURRENT RECOMMENDATIONS

There has been a recent change in the advice we should be giving patients in the given scenario.^[10] This

new advice is evidence based and follows a review of relevant studies looking at the interactions of non-enzyme-inducing antibiotics. Several studies and trials have looked at levels of ethinylestradiol in patients taking the COCP and antibiotics and have not found decreased levels of ethinylestradiol or any change to the pharmacokinetics of ethinylestradiol.^[11]

The World Health Organization updated Medical Eligibility Criteria for contraceptive use in 2010 to include evidence-based guidance on contraceptive use and drug interactions.^[12] On the basis of this, in January 2011, the Clinical Effectiveness Unit of the Faculty of Sexual and Reproductive Healthcare (Royal College of Obstetricians and Gynaecologists) produced new clinical guidance which now states that “additional contraceptive precautions are not required even for short courses of antibiotics that are not enzyme inducers when taken with combined oral contraception.”^[6] This new advice has been incorporated into the guidance given in the British National Formulary.^[13] If the antibiotics (or indeed the illness) should cause diarrhea or vomiting, then the usual additional precautions relating to these conditions should be observed.

CONCLUSION

When prescribing non-enzyme-inducing antibiotics to patients using combined hormonal contraception, the current guidance is that there is no need to tell patients that they should use additional contraceptive methods while taking the antibiotics. For patients on any form of oral contraception should be aware of the side effects when taken in combination with antibiotics. It is important for every dental practitioner to evaluate and educate the patients under oral contraceptives.

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