

**EFFECT OF DRUGS ON ORTHODONTIC TOOTH MOVEMENT: A REVIEW****DANALAKSHMI.J* AND DR.S.P. SARAVANA DINESH***BDS student, Saveetha Dental college, chennai- 77***ABSTRACT**

The pharmacologic agents that would be practical for orthodontic practice are much more limited than those used in other disciplines of dentistry. However this doesn't mean that a full understanding of the pharmacology of drug action, its side effects, and possible contraindications are unnecessary. The objective of this review is to outline the effects and the adverse effects of various drugs on orthodontic tooth movement in patients undergoing orthodontic treatment. Remodelling of periodontal tissues facilitates orthodontic tooth movement in response to mechanical forces. To avoid undesirable influences on tooth movement Orthodontist should be aware of any drug taken by each individual patient. Some of the commonly used drugs like analgesics, NSAIDs like aspirin, COX-2 inhibitors, acetaminophen, vitamin D, prostaglandins, fluorides, relaxin, calcitonin, bisphosphonates, corticosteroids, immunosuppressant's, anticancer drugs, antibiotics, anti-convulsants, interleukins have major influence on bone remodelling and tooth movement. Hence care has been taken in this article to review the influence of all these drugs on orthodontic tooth movement.

KEYWORDS: Orthodontic tooth movement, orthodontic patients, drugs in orthodontics**DANALAKSHMI.J***BDS student, Saveetha Dental college, chennai- 77*

INTRODUCTION

Orthodontic treatment deals with alignment of teeth and correction of proclined teeth by bringing about movement of teeth by application of mild continuous forces. Though orthodontic treatment is primarily taken up by patients in the adolescent and teen age groups, there is no age limitation for this treatment when the periodontal status is good. Due to increasing awareness and willingness of patients to undergo this treatment, the scope for this speciality of dentistry, in the area of adult orthodontics, has widened. Hence it becomes mandatory for the Orthodontist to be aware of the potential influence, on the orthodontic tooth movement, of various drugs the patients of this group could be taken. Orthodontic treatment sometimes leads to mobility of the tooth. Remodelling of periodontal tissues facilitates orthodontic tooth movement in response to mechanical forces. To avoid undesirable influences on tooth movement Orthodontist should be aware of any drug taken by each individual patient. Prostaglandins which act as mediators in bone resorption play a major role in tooth movement. Prolonged pressure on the teeth causes remodelling of periodontal structures resulting in the movement of teeth. Some of the commonly used drugs like analgesics, NSAIDs, aspirin, COX-2 inhibitors, acetaminophen, vitamin D, prostaglandins, fluorides, relaxin, calcitonin, bisphosphonates, corticosteroids, immunosuppressants, anticancer drugs, antibiotics, anti-convulsants, interleukins have major influence on bone remodelling and tooth movement.

DRUGS FOR PREPARING ORTHODONTIC PATIENTS

Anti cholinergics help in decreasing the salivary flow. This facilitates better acid-etching and bonding of orthodontic appliance¹. Anti-anxiety drugs like benzodiazepine have limited application in orthodontics as premedication in apprehensive patients. Anti-anxiety drugs relieve anxiety, tension of the patient and also helps in controlling the patients pain reaction¹. Procedures like banding, debanding, tooth separation by wires or clips would require antibiotic prophylaxis. As these procedures most often cause trauma to the gingival leaving the open wound exposed to oral micro flora. There is very much chance of infection. When orthodontist, administers a drug, he must know and understand the nature of drug, indications and contraindications and adverse side effects of the drug. Antibiotics are also used as prophylactic measures for prevention of infective endocarditis¹. According to American heart association, general recommendation has been made. It states that "antibiotic prophylaxis is recommended for all dental procedures, that are likely to cause gingival bleeding, but no antibiotic coverage is recommended for simple adjustments of orthodontic appliances"².

EFFECTS OF COMMONLY USED DRUGS ON ORTHODONTIC TOOTH MOVEMENT

Fluoride mouth rinses play a major role during orthodontic procedures. It helps in reducing caries and periodontal diseases^{1,2}. Various studies revealed that ibuprofen lowers orthodontic pain when compared to placebo at 2 hours and 6 hours after separators or arch wire placement. NSAIDs are most commonly used in orthodontics in order to relieve pain due to inflammatory origin². NSAIDs like aspirin, acetaminophen, ibuprofen are administered. They act by inhibiting the cyclo-oxygenase enzyme that results in formation of prostaglandins and other inflammatory products. NSAIDs inhibit the inflammatory reaction produced by prostaglandins and slows down the tooth movement. Aspirin inhibits COX activity and delays the treatment and decreases bone resorption. Hence orthodontic patients are not advised to take aspirin for a long period of time. Acetaminophen (paracetamol) have very good effect for controlling pain and discomfort associated with orthodontic treatment³. Prostaglandins exhibit an important role in inflammation as inflammatory mediators that allows orthodontic tooth movement. It helps in inhibiting tooth movement by delaying orthodontic treatment and decreases the velocity of tooth movement⁴. Animal study has been made and revealed that local use of vitamin D increases the orthodontic tooth movement. Calcitonin is used in the treatment of osteoporosis. Oral contraceptives when administered by young women over a period of time influences the rate of tooth movement⁵. Use of thyroid drugs like propylthiouracil increases the velocity of tooth movement and lowers the frequency and dimensions of resorption lesions^{2,5}. Synthetic corticosteroids are used in various medical conditions. With use of corticosteroids there is greater chance of relapse, increase rate of tooth movement since there is no new bone formation⁶. Bisphosphonates widely used in treatment of various bone diseases. They are potent blockers of bone resorption. They inhibit osteoclastic resorption leading to inhibition of orthodontic tooth movement and delays the treatment⁷. Relaxin known as pregnancy hormone. Nicozin and colleagues suggested that relaxin might be used as an adjuvant to orthodontic therapy, for promotion of stability of tooth⁸. Interleukins / TNF-alpha antagonists help in bone remodelling and reduce tooth movement⁹. Echinatin enhances anchorage. Various studies revealed that administration of echinatin decreases the root resorption due to orthodontic forces¹⁰. Immuno-suppressant drugs when administered for prevention of graft rejection (cyclophosphamide) produce severe gingival hyperplasia making orthodontic treatment even more difficult¹¹. Anti convulsants like phenytoin makes the orthodontic treatment even more difficult because administration of this drug leads to gingival hyperplasia involving interdental papilla¹².

CONCLUSION

The practice of orthodontics sometimes requires various drugs during treatment. The usages of drugs are to prepare patients for orthodontic treatment as in bonding brackets and buccal tubes, reduce pain from force

application to biological tissues, manage temporomandibular joint problems, reduce anxiety in apprehensive patients and reduce infection during the course of treatment. Hence the knowledge about the

pharmacodynamics, pharmacokinetics and side effects of drugs used during orthodontic treatment has become imperative.

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