International Journal of Pharmaceutical Science Invention
ISSN (Online): 2319 – 6718, ISSN (Print): 2319 – 670X
www.ijpsi.org Volume 2 Issue 12‖ December 2013 ‖ PP.36-37

The Role of Cetylpyridinium Chloride Mouthwash In The Treatment of Periodontitis.

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ABSTRACT: *Dental plaque is a biofilm of microorganisms that colonize on hard and soft tissues in the oral cavity.Plaque has been identified as a primary etiological agent for periodontal diseases.Hence efficient removal of plaque is necessary for maintain healthy periodontium.Mechanical and chemical plaque control are methods of eradicating dental plaque[1].Cetylpyridinium chloride has been recently introduced as a chemical plaque control agent.This artiucle summarizes the effect of cetylpyridinium chloride as a mouthwash.*

***KEYWORDS*:** *Cetylpyridinium chloride,plaque,biofilm*.

I. INTRODUCTION

Mouthwashes are typically used as adjunctive therapies to tooth brushing regimens.Mouthwashes are complex mixtures and,in addition to the active ingredient,can contain a variety of excipient ingredients able to exert some effects on bacterial viability.These include surfactants and preservatives.Large densities of microorganisms are commonly recovered from human mouth.Physiological conditions of the mouth include periodic food intake,along with stability in temperature and ,moisture,resulting in an optimal environment for the growth and proliferation of these organisms[2].Physical and chemical properties of plaque bacteria facilitate binding to oral surfaces of the tooth enamel to form biofilms.Effective oral hygiene represents a patient-directed means to control the microbial populations of dental plaque.While the etiology of periodontal diseases can be highly complex,the primary control mechanism for the prevention and control of periodontal diseases remains mechanical removal of dental plaque,traditionally accomplished with a toothbrush and dental floss or other interdental cleaning aids.Therefore the goal in treating periodontal disease from the first stages of gingivitis to the severe chronic forms,remains the removal of supragingival and subgingival plaque.When dental plaque is not thoroughly removed,the bacteria and the related toxins repeatedly insult the the periodontal tissues and contribute to the destructive inflammatory process and immune response,resulting in a loss of the supporting structures of the teeth.

II. HISTORY

The use of physical and chemical components for oral hygiene dates back to approximately 3000 years before Christ.Throughout history,man has developed tools to take care of teeth and prevent bad odour.Later,with the emergence of microbiology,it was found that those responsible for bad breath and the most common oral diseases were bacteria,and removing them with antiseptics was proposed[3].Until now,a series of compounds with the ability to eliminate microorganisms have been tested;however it has been discovered that not all of them can be used in the oralcavity,because they can potentially damage the soft tissues,mucosa or the teeth or because they have an unpleasant taste or smell.These difficulties exist today and should be resolved in order to come up with effective oral hygiene tools[4].

III. MECHANISM OF ACTION

Generally,chemotherapeutic antiplaque mouthwashes are effective for their mechanism of action as they decrease new dental plaque growth,decrease or remove existing dental plaque,diminish the growth of pathogenic bacteria,and inhibit the production of virulence factors.CPC is a quaternary ammonium compound with broad spectrum anti-bacterial activity[5].It is a cationic surface active agent(surfactant) which absorbs readily to oral surfaces.The molecules has both hydrophilic and hydrophobic groups.The positively charged hydrophilic region of the CPC molecule plays a major role in its antimicrobial activity,imparting a high binding affinity for bacterial cells whose outermost surface carries a net negative charge[11].The strong positive charge and the hydrophobic region of the CPC enable the compound to interact with the microbial cell surface and integrate into the cytoplasmic membrane.As a result of this interaction,there is disruption of membrane integrity resulting in leakage of cytoplasmic components,interference with cellular metabolism,inhibition of cell growth and cell death.CPC also inhibit the synthesis of insoluble glucan by streptococcal glucosyl transferase,adsorb to pellicle-covered enamel and inhibit co-adhesion of bacteria,and bind streptococcus mutans biofilms[6].The

ability of CPC to adsorb to pellicle covered enamel imparts substantivity to the molecule,that is retention in the mouth and continued antimicrobial activity for a period of time after rinsing[7].

IV. PROPERTIES

Different studies have shown that mouthwashes containing CHX,CPC and a combination of both act efficiently as anti-plaque agents on halitosis and gingivitis[8].It also possess some adverse effects such as promoting the formation of calculus,tooth staining and a bitter taste.It also may cause mucosal irritation and desquamation.

V. CONCLUSION

Other clinical studies have tested mouthwashes with different formulations and concentrations of CPC.In general their results show that this compound,by itself at different has anti-plaque effects[9,10].It also has been combined with sodium fluorid,alcohol and CHX with the intention of reducing the concentration of the two latter compounds because of their adverse effects.Thus,it has been proven that CPC can be used as a treatment for certain oral pathologies like mucositis[12,13],especially in patients who have undergone irradiation for head and neck cancer or those who suffer from periodontitis or gingivitis.

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