Stannous Fluoride Dentifrice with Sodium Hexametaphosphate: Review of Laboratory, Clinical, and Practice-Based Data

By Cynthia Sensesahungh, RDH, BS; Mary Elizabeth Sagel, BS, MA

Abstract

Dentifrice was originally used to promote oral hygiene by cleaning teeth. However, with advances in product formulation, it has become a valuable vehicle for the delivery of agents offering health and cosmetic benefits. Stannous fluoride, introduced in 1955 in dentifrice, is one of the longest established of such agents. The well-known anti-caries efficacy of stannous fluoride is based on its impact on the teeth surfaces and on its antibacterial activity. More recently, the demand for tooth whitening products has increased and sodium hexametaphosphate has been shown to be helpful in whitening surface stains and in controlling calculus. A dentifrice formulation which combines the benefits of stannous fluoride with those of sodium hexametaphosphate is now available. A review of the evidence shows that in addition to effective anti-caries action, this formulation is effective in fighting plaque, gingivitis, and gingival bleeding while inhibiting calculus and extrinsic stain.

A practice-based evaluation including data from over 1,200 dental professionals and 1,000 patients demonstrates the product’s benefits and excellent acceptability. Collectively, the research shows this stannous fluoride/sodium hexametaphosphate dentifrice provides multiple benefits to meet the oral health and cosmetic needs of patients.

Key Words: stannous fluoride, dentifrice, gingivitis, caries, sensitivity, calculus

Introduction

Patients today represent one of the most heterogeneous groups in history in terms of age, health status, oral hygiene habits and other factors. While certain oral health conditions are more prevalent among specific patient groups, such as periodontal disease among diabetic patients, many oral health conditions affect the broad population. According to U.S. surveys, virtually all adults have had dental caries, more than half experience gingivitis, and roughly one in three suffer from dental sensitivity. Fortunately, home care products are available to help prevent and treat many common oral health conditions in conjunction with routine professional care.

Dentifrice is one important example. Many years ago, the benefits of dentifrice were limited to dentifrice formulation for the prevention and control of tooth decay. It was common for professionals to tell patients to “use any dentifrice with fluoride and the ADA Seal.” However, formulators today can design dentifrices to provide numerous other benefits, both for health and cosmetic purposes.

In 2005, a stannous fluoride/sodium hexametaphosphate (SFSH) formula, which uses a low-water control, greatly reduced the amount of plaque acid and also inhibited in situ method that allows evaluating a formulation’s biological action (Figure 1).

The resulting dentifrice has improved esthetic qualities over the original stannous fluoride formulation, and delivers a broad range of therapeutic and cosmetic benefits (Figure 1). The remainder of this paper provides a summary review of research on stannous fluoride, sodium hexametaphosphate dentifrice.

Figure 1. Benefits of stannous fluoride and sodium hexametaphosphate

- **Antibacterial activity against species associated with plaque, gingivitis, caries and malodor**
- **Reduces plaque**
- **Reduces gingival inflammation and bleeding**
- **Protects against hypersensitivity**
- **Remineralizes enamel and protects against demineralization**

Figure 2. Bacterial activity assessment 16 hours after exposure. Left: water control. Right: stannous fluoride/sodium hexametaphosphate dentifrice. Green-stained cells are live microbial cells; red-stained cells are dead cells (from Ramji et al.).

The present abstract provides a summary review of research on stannous fluoride, sodium hexametaphosphate dentifrice. Green-stained cells are live microbial cells; red-stained cells are dead cells.

Other polyporphosphates, sodium hexametaphosphate does not usually show good long-term stability in aqueous dentifrices. However, the novel single-phase SFSH formula, which uses a low-water system in a silica-based formulation, significantly reduces the hydrolysis of sodium hexametaphosphate and helps to maintain effective levels of whitening activity.

The resulting dentifrice has improved esthetic qualities over the original stannous fluoride formulation, and delivers a broad range of therapeutic and cosmetic benefits (Figure 1). The remainder of this paper provides a summary review of research on stannous fluoride, sodium hexametaphosphate dentifrice.

Antibacterial and Anti-inflammatory Action

Most of the oral health benefits of stannous fluoride result from its antibacterial efficacy, particularly against bacteria associated with dental caries, periodontal disease, and oral malodor. Laboratory and clinical studies have shown that stannous fluoride, unlike other fluorides, inhibits bacterial growth by a variety of mechanisms, including interference with metabolic pathways, thus reducing bacterial acid formation, and inhibition of bacte-
Prophylaxis and control of dentinal hypersensitivity

Dentinal hypersensitivity (DHS) or dentinal pain, is a condition commonly associated with exposed dentinal tubules or other clinical defects such as caries or composite restorations. It is defined as the rapid pain arising from exposed dental tubules in response to various stimuli. The prevalence of DHS varies widely, with estimates ranging from 30% to over 90% in different populations. The condition is characterized by a sharp, electric-like pain that can be triggered by cold, heat, or mechanical stimuli such as brushing.

The etiology of DHS is multifactorial and can be related to several factors including external trauma, caries, and dental restorations. Treatment options for DHS include desensitizing toothpastes, root canal treatment, and pulpotomy. However, the most effective treatment is often not readily available or affordable, making the condition a significant public health issue.

Recent studies have shown that stabilized stannous fluoride dentifrice (SFSH) can be effective in reducing the symptoms of DHS. A meta-analysis of 12 randomized controlled trials comparing SFSH to placebo or standard sodium fluoride dentifrice found a significant reduction in the incidence of symptoms in patients using SFSH. The effect was dose-dependent, with higher concentrations of stannous fluoride resulting in greater reductions in pain.

The SFSH dentifrice also contains triclosan, which has been shown to have antimicrobial properties. This dual-action formula has been shown to provide significant reductions in the incidence of DHS, with reductions ranging from 40% to 80% depending on the study.

The mechanism of action of SFSH in reducing dental hypersensitivity is thought to involve the formation of tetrafluorostannic acid (SnF4) upon contact with saliva, which can deposit on the dentin surface and act as a barrier to the transmission of stimuli. Additionally, SFSH has been shown to reduce the sensitivity of dentinal tubules, likely through its ability to inhibit the flow of calcium and phosphorus into the tubules.

In conclusion, the use of stabilized stannous fluoride dentifrice can be an effective treatment for dentinal hypersensitivity. Further research is needed to determine the optimal formulation and dosage to achieve the best clinical outcomes. Healthcare providers should consider informing their patients about the availability of this treatment option and the potential benefits of using SFSH dentifrices for the management of dental hypersensitivity.
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*ON ENAMEL PLAQUE AND ENAMEL EROSION VS ORDINARY TOOTHPASTE

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was as good as that of positive controls and concluded that the addition of sodium hexametaphosphate did not interfere with the normal activity of stannous fluoride.

A series of in vitro studies evaluating the potential of the SFSH formulation have been reported in one publication and two abstracts. In a study of fluoride uptake into demineralized enamel, it exhibited uptake comparable to a clinically proven stannous fluoride and silica dentifrice.13 In a second in vitro study, periodic cycling the experiment, the stannous fluoride/sodium hexametaphosphate provided almost complete protection against lesion initiation and progression; it was not observed clinically conventional stannous dentifrices.14 These studies indicate that this SFSH dentifrice is as effective as clinically proven fluoride dentifrices both in its mode of action and in its clinical performance.

Anticaries Effects
Dental calculus results from the mineralization of bacterial plaque formed on the surfaces of teeth. Aggregates of hydroxyapatite, particularly condensed phosphates, have been found to be a key factor in the prevention of calculus development. In this class of phosphates, sodium hexametaphosphate has been shown to be particularly effective. In vitro studies by White et al. have demonstrated that the antimicrobial action of sodium hexametaphosphate in aqueous solution or in a dentifrice.16 The effects were significantly greater than for a conventional anti-caries dentifrice containing propylene glycol. This finding has been supported by four 6-month clinical trials in which sodium hexametaphosphate produced significant reductions in calculus formation – whether calcium carbonate or calcium fluoride or stannous fluoride – as compared to a regular sodium fluoride dentifrice or a trilose-4/copolymer dentifrice.17 A total of 866 subjects participated in the four clinical trials. Efficacy was assessed using a standard clinical method (Volpe-Manhold Index) that measures calculus reductions of 55% and 50% at baseline and 2 weeks; 67 the authors thank Jane Mitchell at Procter & Gamble. Prior to this position, she was a Principal Researcher in Oral Care Research & Development.

The authors thank Jane Mitchell (MWS Ltd, Staffordshire, UK) for assistance developing the manuscript.

References
5. More recently, the SFSH dentifrice; J Clin Dent. 1995;6(spec no):29-36.
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Extrinsic tooth discoloration, an updated review

By Dr. Kassie Cynthia DDS, DESCO, DUDIR, Department of Esthetic and Restorative Dentistry – Saint Joseph University – Faculty of Dentistry, TAHAN, DDS, Department of Prosthodontics – Lebanon University - Dental College TAHAN, DDS, Oral Imaging Center, OMPIS-IMPATH research group, Department of Immunology and Mediterranean Medicine, University of Leuven and Oral & Maxillofacial Surgery, University of Leuven, Prof. Mehanna Carina DDS, CESDA, PhD, FICD, Director of Esthetic and Restorative Dentistry Postgraduate Program Saint Joseph University, President of the continuing education committee - Lebanese Dental Association

A variety of colors can typically be seen in the gingival margin due to the gingival margin to the incisal edge of the tooth a gradation of the color occurs. Any changes of tooth structure is likely to cause an alteration in outward appearance of tooth caused by changes of light transmitting and reflecting properties. Different staining agents are located on the outer surface of the tooth structure, others are caused by extrinsic staining factors which are caused by intrinsic congenital or systemic influence. The majority of tooth discolorations are extrinsic in nature and appear as brown ingestions. Dental treatments are an integral part of involving the etiology and implementing therapy. An overview of the extrinsic etiologies and the clinical appearance of tooth discoloration are discussed in this review.

Key-words: Discoloration, stains, etiology, whitening, chromogenic product.

Introduction

Ever since the ancient times, mankind has been questing for beauty through the perfection of their dentition, for example, used urine and gutt milk in an attempt to whitewash their teeth. There has been a recent increase in interest in the treatment of extrinsic staining and discoloration as by the large number of tooth whitening agents appearing on the market.

Teeth discolorations are associated with many clinical and esthetic challenges. They can have an impact on a person’s self-esteem and social confidence in today’s society, where most people place tooth color high. There is an increasing awareness of the fact that tooth discoloration is important as it has a profound effect on treatment outcomes.

Normal enamel is colorless and transparent. The outermost layer dentin is mainly responsible for the color of the tooth. The dentin is the inner layer of the tooth color where it consists of thick layers and where the enamel layer is thin (cervical margin).

A study evaluated the color stability of commercially available denture teeth materials with and without filtered coffee solution was found to be more chromogenic than the tea, and cola staining solutions.

The aim of an in vitro study done by Mahmoud et al, was to compare the color stability of tea and coffee. It was found that cigarette smoke was the most staining agent.

The aim of this review is to systematically search the literature for data concerning extrinsic tooth discoloration etiologies in order to establish the right treatment plan.

1 - Tobacco

For ages, tobacco has been popular and its use is significantly increasing, a spike of alarming health hazards.

Tobacco smoking and chewing (chewing of betel nut) seem to be inextricably joined to the tooth and tongue. Pan, tobacco, is known to cause staining. Smoking leads to not only tobacco and nicotine but also to staining. Tobacco and cigarettes but it also leads to gum disease and oral cancers. There are all tobacco-containing substances, including tobacco, nicotine and tar that can harm tissue and mucosal integrity. The use of periodontal diseases and infections. This is true of cigarettes, chewing tobacco, waterpipe and pipes and cigars to varying degrees, all will cause bad breath, crinkled teeth and ugly brownish-yellowish stains. Tobacco is rich with nicotine which is named after the tobacco plant Nicotiana tabacum. It is an inherently colorless substance that turns yellowish-brown when it comes in contact with oxygen. When cigarette smoke is inhaled, the inside of the tooth is discolored. There are two types of tooth discoloration: extrinsic which affects the external surface of the teeth and intrinsic which affects the teeth from the inside.

Extrinsic discoloration lies on the tooth surface or in the acquired pellicle. The majority of tooth discolorations are extrinsic in nature and appear as brown ingestions. Extrinsic staining of a single tooth is unusual. The distribution is usually generalized and disfiguring. Extrinsic staining can also occur on surfaces with poor toothbrush accessibility. Smoking, tea or coffee consumption and increasing age are promoting factors and such discolorations are frequently seen in contact with oral use of antibacterial plaque-inhibiting mouthwash. Chemical alteration of the acquired pellicle appears to be the major reason for these brown ingestions.

The causes of extrinsic staining can be divided into two categories; those compounds which are incorporated into the pellicle and produce a stain as a result of their basic color 2 or those which lead to staining caused by chemical interaction at the tooth surface.

Direct staining has a multi-factorial etiology with chromogens derived from dietary sources or substances habitually placed in the mouth. These chromogens are taken up by the pellicle and the color imparted is determined by the nature of the outer layers of the chromogen. The origin of the stain may be metallic or non-metallic.

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and wine–caused enamel color changes; however, the wine led to greater staining than did cof-
fee.9,10

**d - Cola Drinks**

Dark-colored colas not only stain teeth, but also erode tooth enamel and cause tooth decay,11,12 although a new article found no significant differences in the frequency of the consumption of foods and beverages and the presence of dental erosion.13

Other articles found greater enamel dissolution occurring in flavored and energy (sports) drinks than in cola drinks.13-15 The influence of coffee, tea, cola, and red wine staining on the color of teeth after home bleaching has been evaluated. A total of 45 samples were obtained from 45 sound maxillary central incisors. The samples were immersed in four staining solutions (coffee, tea, cola, and red wine) or artificial saliva. Following 15 min and 6 h of immersion on the first day and next day of all the staining solutions, the lowest ΔE values were observed with coffee staining versus artificial saliva (control group), for all time intervals evaluated after whitening. There were statistically significant differences between the red wine, cola, and tea solutions.15

A study assessed the influence of surface sealant on the color stability of composite resins. Red wine resulted in the highest level of discoloration. Intermediates were used for orange juice, and the cola soft drink.16

**e - Cranberry Juice**

Some drinks that may be relatively good for health may not be so good for teeth in terms of staining them. Cranberry juice, grape juice and other dark-

**f - Soy Sauce**

Soy sauce is a condiment made from a fermented paste of boiled soybeans, roasted grain, brine, and Aspergillus oryzae or Asper-
gillus sojae molds.17

Iron-fortified foods can help prevent iron deficiency so can iron-fortified soy sauce due to the relatively high iron absorp-
tion from soy sauce.18,19 But soy sauce sticks to teeth, and the dark-colored pigment can cause very bad stains. In a study done by Chan KC, the discoloration from soy sauce was found to be super-
ficial and ingressive for dentin and cementum. Discoloration of cementum exceeded that of dentin, and dentin stained more than enamel. Coffee and soy sauce stained the calcified den-
tin tissues more than the cola beverage and tea. The longer the staining time, the deeper was the discoloration.19

**g - Balsamic Vinegar**

Balsamic vinegar is deeply pig-
mented causing teeth discolora-
tion. The polyphenols of cranberries interfere with various activities (including formation of bio-
film and adhesion) of Porphy-
romonas gingivalis, the main etiologic agent in chronic peri-
odontitis.20,21

In order to avoid these stains, straws should be used and mouthwash followed by tooth brushing should be done.

**h - Tomato Sauce**

Lycopene is a micronutrient with important health benefits, because it contains natural anti-

**i - Blueberries**

Berries are a rich source of a wide variety of non-nutritive, nutritive, and bioactive com-

**j - Betel leaf: India, Pakistan**

The betel (Piper betle or Paam) is the leaf of a vine belonging to the Piperaceae family, which includes pepper and kava. Ex-

**k - Liquorice**

It is a uniquely tasting herb de-
gined causing teeth discolora-
tion. Thus, balsamic vinegar reduces lipoprotein, and it has an anti-diabetic effect.22

In spite of these health benefits, Balsamic vinegar is deeply pig-
muted causing teeth discolora-
tion.

The polyphenols in cranberries and blueberries have several potential health benefits.26 For example, blueberry extracts may reverse the declines of cogni-
tive and behavioral function in the ageing process.27 Antioxy-

dated, anti-inflammatory, and anti-proliferative properties, both in vitro and in vivo.28

Wild blueberries are rich in polyphenols and have several potential health benefits.29 For example, blueberry extracts may reverse the declines of cogni-
tive and behavioral function in the ageing process.30 Antioxy-

dated, anti-inflammatory, and anti-proliferative properties, both in vitro and in vivo.28

Even if the deep berry blue color can cause deep staining, aren’t all the benefits cited above worth staining teeth?31

3 - Betel leaf: India, Pakistan

The betel (Piper betle or Paan) is the leaf of a vine belonging to the Piperaceae family, which includes pepper and kava. Explo-
red for their unique medi-
cal properties, the leaves of Pip-
er betel, an evergreen perennial vine, are a reservoir of phenolics with anti-inflammatory and antimicrobial activities.32 It is a compound of natural substances chewed for its psychostimulat-
ing effects. Studies showed that oral feeding of betel leaf extract (BLE) significantly inhibited the growth of human prostate.33,34 It is believed that chewing be-
tel quid could reduce stress, strenthens teeth and maintain oral hygiene.35

Approximately 200 million persons chew betel regularly throughout the western Pacific basin and south Asia. There is copious production of a blood-
edred saliva that can stain oral structures. After years of chew-
ving, the teeth may become red-
n to nearly black.36

4 - Liquorice

It is a uniquely tasting herb de-

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Conservative Care and Treatment of TMJ Dysfunction in Dental Patients

By Shivani Sarsthi, Physical Therapist (TMJ Specialist)

Each year, the number of reported cases of TMJ dysfunction in patients increases, due to stress, trauma to the jaw, post-dental procedures, or other factors. Since the TMJ suffers growing, TMJ dysfunction is defined as a term covering high loss of the muscles of mastication and the temporomandibular joints.

The symptomatic picture of a TMJ patient does vary significantly, depending on the individual; some complain of muscle, joint, and facial pain, difficulty with chewing, joint sounds, and frequent headaches. Recent studies show that more females than males suffer from TMJ symptoms, most of which, are in their childbearing years.

The conventional methods used to treat TMJ dysfunction include: Botx to relax specific muscles groups (masseters, or, thondontics (braces, retainers, mouth guards), and in some cases, injections. There exist options in the field of physical therapy for patients looking for an alternative health approach. Specialized treatment involving soft tissue release and joint mobilization, alone, has had a profound effect on the reduction of pain and dysfunction of TMJ suffers. Application of intra-oral technique to release the lateral pterygoid and myo- facial release to the anterior neck component are two examples of treatment goals. Both techniques, aid in improving pressure on the jaw caused by hyper- toned muscle groups.

There is a demand placed on oral surgeons and dentists, to address TMJ related com- binations, specifically after oral surgery, and dental procedures in which the jaw is open and overstretched (beyond normal range), for a long period of time. A patient may experience trauma during and after the surgery, resulting in altered movements, and discords with pain.

Further benefits the patient with help of pain management and restoration, functional and func- tional range of motion of the TMJ.

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Recent research shows a link between stress and the TMJ. Specific triggers for the treatment, intake and smoking, for example, have an effect on sleep qual- ity, and therefore, may promote bruism at night. Bruism, is a neurologic, sleep movement disorder characterized by grind- ing or clenching of the teeth in our sleep. This disorder is very damaging to the teeth and the mouth, and also causes fatigue and pain to the facial mus- cles. Lifestyle changes and sleep hygiene techniques can be fore- forced by the physical therapist, to help maintain optimal TMJ functioning and help manage pain and discomfort.

Treatment and management of TMJ is a joint effort between pa- tients and their dental care el- eals and can be effectively treated through specialized physical therapy modalities.

For thousands of years, Glycyrrhiza glabra has been used as a traditional medicine in the East and West. Licorice is the predominant, character- istic chalcone in licorice root which might be involved in the patho- genesis of various pathologies or foods consumed in vast amounts without any regard or awareness to the deleterious effects. An essential oil/phenolic component of licorice, known, is the characteristic staining agent in licorice root which presents with typical symptoms including yellowing of the tongue, brownish/black tongue stain. Licorice can stain teeth, as well as the lingual side of teeth prone to accumu- lating dark tooth stain but also the mucosa undergoes specific changes. Gingival re- section, alveolar bone loss, and periodontal destruction are all seen from the deleterious effect of the to- bacco smoke.

Heavy tooth bacterial dental staining can be noticed from pipe smoke in- spiration with Licorice as an additive. Tobacco causes a release of tooth and bacterial tartar, especially when included in aromatic pipe tobacco. Tobacco is directly proportional to the amount and frequency of the pipe smoking. Not only on the palatal gingival side of teeth prone to accumu- lating dark tooth stain but also the mucosa undergoes specific changes. Gingival re- section, alveolar bone loss, and periodontal destruction are all seen from the deleterious effect of the to- bacco smoke.

Liquorice is used as a flavorant in a variety of edibles, medi- cine, and tobacco, and is often incurred in mouthwash in vast amounts without any regard or awareness to the deleterious effects. An essential oil/phenolic component of licorice, known, is the characteristic staining agent in licorice root which presents with typical symptoms including yellowing of the tongue, brownish/black tongue stain. Liquorice is associated with dark caramel and food colorings. Frequently liquorice is mixed with dark caramel and food colorings which might be involved in the patho- genesis of various pathologies, from stress, trauma to the jaw, and problems caused by the physical therapist.

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5 - Curry
Curry powder is commonly used spice in many countries of the world. This spice can stain teeth and, if inhaled, it could lead to health problems. Hypersensitiv- ity pneumonitis (HP) is a group of immunologically mediated lung diseases caused by the inhalation of environmental agents (organic dusts from vegetable or animal products), in susceptible individuals.8

Ardo reported a case of a man who had worked in a factory that produced curry sauce for 15 years and developed a non- specific interstitial pneumonia (NSIP) with bronchiolitis and pleural effusion. There was moderate evidence that a combination of CHX and an OA reduces tooth staining without interfering with plaque growth inhibition.21

Most of the search into stain for- mation has been carried out on chlorhexidine, although there are other antiseptics which cause staining to a lesser extent and in some circumstances proven could be applicable to stain- ing found with polyvalent met- als. The caracteristic staining of the tongue and teeth noted by Flotra is not peculiar to chlorhexidine, it has been reported in other cationic antiseptic- tics, an essential oil/phoenolic mouthwash.13 The following prolonged use of delmopinol mouthruses. There is great indi- vidual variation in the degree of staining from person to person, this makes explanation more difficult. It is also caused by intrinsic factors, differences in extrinsic factors or both.Esk suggested that the protein and carbohydrate in the acquired pellicle could undergo a series of condensation and polymeriza- tion reactions leading to discol- oration of the acquired pellicle. Chlorhexidine may accelerate formation of the acquired pellicle and also catalyse steps in the Maalick reaction.28

The results of a recent study demonstrated that regular use of CPH and chlorhexidine resulted in extrin- sic stain accumulation after six weeks, with increased accumu- lation after 12 weeks versus brushing alone.31

Polyamylglycoside (PVP) (a polymer used as a synthetic blood plasma substitute and in the cosmetic, drug, and food- processing industries) was shown in vitro to reduce chlor- hexidine induced tooth staining and without affecting the uptake of the antiseptic to the test sub- strate. A study in vivo aimed to determine whether PVP affects plaque and dietary staining by chlorhexidine on chlorhexidine rinse. Tooth stain areas were comparable for placebo, 0.05% and 0.06% chlorhexidine rinses, but significantly reduced with the PVP/chlorhexidine rinses compared to placebo. PVP, at the concentra- tions tested, reduced the stain propensity of a 0.06% chlorhex-idine rinse but at the expense of some loss of plaque inhibition.32

Adly et al wanted to determine whether a co-polymer anti- adhesion agent would prevent CPH induced dental plaque and concentra- tion chlorhexidine solution. Additionally, the possibility that an essential oil/phoenolic rinse product may cause staining. Tooth and tongue staining was significantly increased with 0.2% chlorhexidine compared to the essential oil/phoenolic rinse which in turn was signifi-
cantly increased compared to the other 3 rinses. The antiad- hesive/chlorhexidine rinse produced significantly less stain than the anti-adhesive or water rinse.

However, the parallel plaque re- growth study suggested this inhi- bition of staining resulted from the specific antiadhesive activity by the anti-adhesive.

b - Cetylpyridinium chloride: Cetylpyridinium chloride (CPC) is a cationic quaternary amno- mogen used in toothpastes for its antibacterial properties. The CPC can also react with iron in the plaque to produce a green stain.

8 - Chromogenic Bacteria: Chromogenic bacteria cause staining of the dental hard tissue due to the production of extrinsic stains. These bacteria can be easily visualized with the use of agents such as CPC.

As known, Cationic antiseptics used for their antibacterial properties, such as CPC, react with iron in the plaque to produce a green stain. However, these stains can be easily removed using agents such as CPC and povidone-iodine.

A recent study has investigated the use of CPC in the black- pigmented bacteria Prevotella nigrescens and Prevotella intermedia, which are known to cause extrinsic stains. The study found that CPC was effective in preventing dental plaque and reducing gingivitis.

It has also been shown to be effective in preventing dental plaque and reducing gingivitis. It has also been shown to be effective in preventing dental plaque and reducing gingivitis.

As already mentioned, the strength of the cariogenic bacteria can vary depending on the individual. In some cases, the bacteria may produce strong acid that can lead to tooth decay.

The concept of separating the use of antiseptics until sometime after the use of toothpaste (TP) and washing the mouth with CPC as a predictor of activity in vivo. Little staining was seen when this approach was taken. The combination of CPC and chlorhexidine may provide a more effective method of reducing plaque and preventing gingivitis.

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