

# Inhibition of Interproximal Plaque Metabolism Using CPC Mouthrinse

N. Gallitschke\*, P.Bellamy, D. Tumilty, R. Jhaj, P.Bowtell, V.Rane

P&G, Egham, Surrey, UK



0626

## ABSTRACT

**Objectives:** Bacteria present in dental plaque metabolize dietary carbohydrates to produce acids. These acids can diffuse through hard and soft tissues to produce a variety of biological effects in the pathogenesis of dental caries and gingivitis. The objective of this study was to determine the effect of 0.07% CPC (Cetylpyridinium Chloride) containing Crest Pro Health rinse on Interproximal plaque metabolism.

**Methods:** A 21 day home use study was conducted using 50 subjects. Baseline samples were collected from multiple interproximal sites using Oral B ultra floss followed by the cleaning of these sites by a Hygienist. After cleaning subjects were split into two treatment groups; a) tooth brushing alone b) tooth brushing followed by CPC rinse. Interproximal samples were collected at 7 days and 21 days post treatment. Plaque metabolism was monitored by incubating the samples with 5% sucrose for 2h and protein content was estimated by using a validated protein quantification technique<sup>1</sup>.

**Results:** There was a significant reduction in protein content ( $p=0.078$ ) and acidogenic potential (in response to fermentable carbohydrates) ( $p=0.0363$ ), for interproximal plaque samples collected after 21 days treatment with CPC containing rinse in comparison with the tooth brushing alone control leg.

**Conclusion:** The CPC containing mouthrinse used in this study had an effect on build up of plaque and its metabolism at Interproximal sites. Thus additional oral care treatments like antibacterial mouth rinse can help control plaque activity at hard to reach sites, missed by brushing alone.

## INTRODUCTION

The benefits of flossing are well known and documented. It breaks up and removes plaque between the teeth and along the gum line where oral diseases like periodontitis, gingivitis often begin.

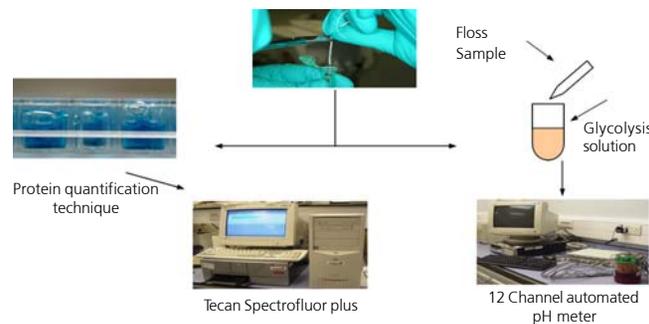
Plaque at hard to reach places which can be targeted by flossing, is difficult to remove by brushing alone. However 49% of the American population floss infrequently or not at all<sup>2</sup>. Therefore complimentary products such as mouth rinses are often recommended as add-on's to daily brushing.

In this study we monitored the effect of 0.07% high bioavailable CPC containing Crest Pro Health mouth rinse on the rebuild and the inhibition of interproximal plaque.

## MATERIALS AND METHODS

A 21 day home use study was conducted using 50 panellists. After a one week washout phase with Crest Decay Prevention (CDP), baseline samples were collected from multiple interproximal sites (4 anterior and 4 posterior) using Oral B ultra floss. Post baseline sampling, volunteers were divided in to 2 groups: a) tooth brushing alone (CDP) and b) tooth brushing with CDP followed by CPC containing rinse twice a day. The distribution of volunteers was balanced based on their total protein content values, age and gender.

Prior to starting the treatment all Interproximal sampling sites were cleaned by a Hygienist to ensure the start of the treatment phase with a completely clean interproximal site to monitor plaque build up. After 7 days of treatment, interproximal plaque samples were collected from the posterior sites (maximum of 4 per subject) only. All 8 sites were sampled again after the 21 days treatment. Subjects were instructed not to brush on the sampling day and were instructed not to eat or drink 1 hour prior to sample collection.



## RESULTS

The results are divided into anterior and posterior sites. As the sites were cleaned before starting the treatment, the new build up of the plaque/ metabolizing bacteria within the different treatment groups was compared. Also changes in the build up of plaque with respect to the screening week was monitored. It can be observed that, for the same amount of protein there is less acid produced by the CPC rinse group, indicating inhibition of growth.

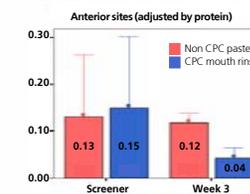
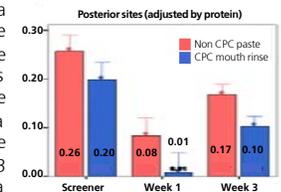


Figure 1 shows the average of anterior sites at the screening week and 3 weeks post treatment. After 3 weeks treatment there is a significant reduction in acid production for CPC rinse ( $p = 0.0163$ ) compared to CDP alone. Also when compared with screening week the CPC rinse ( $p = 0.0147$ ) showed a significant reduction in the acid production after 21 day treatment where as CDP was not significantly different from Screener week.

Posterior sites are difficult to reach with a toothbrush to clean and therefore there is an increased possibility of high plaque and debris depositions. Higher  $\Delta$ pH values for posterior sites indicate this effect. The  $\Delta$ pH changes for posterior sites show a significant reduction for the CPC rinse treatment within sample week 3 ( $p=0.0363$ ) when compared to CDP. Data also shows a strong benefit of professional cleaning with very low acid production one week after cleaning.



## CONCLUSION

The CPC containing formulations tested in this study, showed a significantly higher inhibition of interproximal plaque metabolism compared to brushing alone. This supports the importance of additional prophylactic treatments like antibacterial mouth rinses in maintaining hygiene at hard to reach sites, which can be missed by brushing alone.

Footnotes:

<sup>1</sup>P Bellamy, A. Barlow, G. Puri, K.I.T Wright, A. Mussett, X. Zhou: A New In Vivo Interdental Sampling Method Comparing a Daily Flossing Regime Versus a Manual Brush Control  
*J Clin Dent* 15:59-65, 2004

<sup>2</sup>AAP Patient Page, Jan/Feb, Vol. 3, No 1