Perio Reports provides easy-to-read research summaries on topics of specific interest to clinicians. Perio Reports research summaries will be included in each issue to keep you on the cutting edge of dental hygiene science.

The value of interproximal cleaning

Experimental gingivitis studies over the years have provided evidence of plaque accumulation, greater in posterior interproximals, on disto-buccal surfaces and lingual surfaces, that produces gingivitis. Returning to regular oral hygiene reverses the gingivitis. Researchers at the University of Bern in Switzerland designed an experimental gingivitis study to compare the impact of brushing and flossing on plaque and gingivitis levels.

Four groups of eight undergraduate students participated in this study. Test groups included toothbrushing twice daily with Colgate Total toothpaste, and flossing twice daily with either J&J unwaxed or waxed floss. The fourth group was the control, rinsing only with water.

Plaque and gingivitis scores were zero for all groups at baseline. After 21 days, the control group rinsing with water had the highest plaque and gingivitis scores. Brushing removed more plaque than flossing, with waxed floss removing more plaque than unwaxed floss. Brushing alone didn’t remove all the plaque and didn’t prevent gingivitis.

Gingivitis scores in posterior interproximal sites were lower for brushing, slightly higher for unwaxed floss and higher for waxed floss, despite lower plaque levels for this group.

Clinical Implications: Brushing alone won’t prevent gingivitis interproximally. Both interproximal cleaning and toothbrushing are needed to maintain optimal oral health.


Perio levels in German adults

According to the European research, periodontal disease is least prevalent in Sweden and Switzerland and most prevalent in Lithuania, with 82 percent of 35-44 year old and 95 percent of 65-74 year old with moderate probing depths. Comparing studies from different countries is difficult as researchers use various definitions of disease and a variety of clinical indices.

Researchers at the Ernst-Moritz-Arndt University in Greifswald, Germany, analyzed data from the 2005, national, cross-sectional dental health survey. A recently proposed definition of periodontitis from the AAP and the CDC that includes probing depths and attachment levels was used.

Two groups were evaluated, adults 35-44 years of age (914 subjects) and seniors, 65-74 years of age (797 subjects).

The younger group included more smokers, 33 percent vs. seven percent, had more teeth, 25 on average vs. 14, were more highly educated, had better oral hygiene and yet visited the dentist less often.

Moderate periodontitis (probing depths 4-5mm) was evident in 53 percent of adults and 49 percent of seniors. Severe periodontitis was evident in 21 percent of adults and 40 percent of seniors. These figures are higher than reported for other European countries. Prevalence of untreated periodontal disease is very high in Germany. Awareness and education is needed for the dental profession first and then the general population.

Clinical Implications: Since the dental hygiene profession is relatively young in Germany, perhaps with education and increasing numbers, prevention will reduce the level of periodontal disease in future generations of Germans.


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A variety of gingival indices are available to determine presence, absence and degree of gingivitis. The gingival bleeding index (GBI) is a dichotomous index measuring the presence or absence of bleeding after stimulation with a periodontal probe and is considered an “easy to use, reliable” index. Using this index to measure gingivitis in preschoolers may be difficult, time consuming and unpleasant for the children.

Researchers at the University of Rio Grande do Sul, in Porto Alegre, Brazil, wanted to see if professional toothbrushing provided the same information. A group of 3- to 6-year-olds with at least 10 percent of sites or more with bleeding, but with no caries lesions or fillings were enrolled in the study. Half of 34 children were examined using the GBI first followed 15 minutes later with the toothbrush index. The other half of the group was examined in the opposite order. After a washout period of three to four days, the indices were repeated in the opposite order of the first day. The professional toothbrushing exam was done without toothpaste, and by sextants, with 10 seconds brushing in each section and the presence or absence of bleeding recorded on four sites per tooth.

A high level of correlation was evident between the two indices, with 85 percent agreement shown. There were no significant differences between the two gingival indices. The order the indices were performed did not influence the outcomes.

Clinical Implications: Professional toothbrushing is a reliable way to determine gingival bleeding and thus gingivitis in young children.

The gold standard in mouthrinses is chlorhexidine (CHX), currently available in concentrations from 0.12 in the U.S. to 0.2 percent in other countries. Most, but not all formulations include alcohol as a preservative. CHX is effective in controlling oral bacterial levels for those with less than optimum oral hygiene. Several side effects have been reported: tooth staining, taste alteration, tissue burning and irritation.

Researchers at Complutense University in Madrid, Spain, and the Catholic University in Leuven, Belgium, tested a low concentration CHX mouthrinse for bacterial control in supportive periodontal maintenance patients. CHX (0.05 percent) was combined with 0.05 percent cetyl-pyridinium chloride (CPC), another antiplaque agent in an alcohol-free solution.

The test group of 25 subjects and the placebo group of 22 subjects were evaluated for plaque, bleeding, probing depths and microbial counts at baseline and three months. Assigned mouthrinses were used twice daily for 30 seconds after toothbrushing. All subjects received a prophylaxis at baseline.

Plaque levels increased slightly in the placebo group and were significantly reduced in the test group. Despite different plaque levels, gingivitis levels reduced equally for both groups. At baseline the test group exhibited higher bleeding scores, which were significantly reduced at three months, matching the placebo group. The test group did show slight reductions in probing depths. Staining and tissue burning were reported by 14 subjects in test group compared to four subjects in the placebo group.

Clinical Implications: A new low concentration CHX and CPC mouthrinse may soon be marketed controlling plaque for periodontal maintenance patients.

Escribano, M., Herrera, D., Morante, S., Teugheis, W., Quirynen, M., Sanz, M.: Efficacy of Low-Concentration Chlorhexidine Mouth


Pregnancy gingivitis has been reported at levels from 36 to 100 percent, depending on the study. Suggested etiology includes hormones, immune response or both. Researchers at Complutense University in Madrid, Spain, compared pregnant and non-pregnant women to determine if hormones or immunological changes influenced pregnancy gingivitis.

Statistical analysis determined that the sample size needed to be 45 subjects. To account for dropouts the researchers set a goal of 60 subjects. Forty-two pregnant women began the study, but due to miscarriages, illnesses, loss of interest in the study, and other reasons, only 26 complied with the fourth and final visit postpartum. Of the 28 non-pregnant women who began the study, eight dropped out, leaving only 20 who completed the study.

In addition to clinical indices, progesterone and estradiol were measured in saliva samples. Gingival crevicular fluid samples were taken to measure IL-1 and PGE2. No changes were noted for any measurements in the non-pregnant group.

Plaque levels showed a slight decrease during pregnancy, probably due to oral hygiene instructions given at the start of the study. Gingivitis levels did increase, but only very slightly from 1.01 to 1.13. Progesterone and estradiol levels were higher for the pregnant women than controls at both the first and second trimesters, but did not correlate with gingivitis levels. IL-1 and PGE2 levels remained the same for both groups throughout the study.

Clinical Implication: More research is needed to determine the specific etiology of pregnancy gingivitis. It may be that hormonal changes affect the tissues directly, predisposing them to inflammation.