Numerous studies have demonstrated that power toothbrushes can provide improvements in patient hygiene (Sicilia et al. J Clin Perio 29:39-54, 2002).

**Objective:** In this study we applied a Digital Plaque Image Analysis methodology to measure the effectiveness of a rotation oscillation power toothbrush as compared to manual toothbrush.

**Methods:** Seventeen subjects were preliminarily assigned commercial tubes of Crest® Cavity Protection dentifrice and an Oral-B® manual toothbrush (P35) with instructions for bid brushing morning and evening. Subjects remained on CCP dentifrice for two weeks during which they were imaged on 3 days each including assessments of pre brush a.m.; post brush a.m. and p.m.; plaque regrowth respectively using standardized UV imaging techniques (White et al. J Clin Dent 17:22-26, 2006). At week 3, subjects replaced their manual brush with an rotation oscillation power toothbrush (Oral-B® Triumph™ - OBT) – supplied with a detailed instruction/training video to assist in education and compliance with recommended power brush regimen. Plaque was evaluated for an additional week with 3 repeat assessments at like timings. Plaque results are reported as average plaque area coverage on dentition.

**Results:**

- **Pre brushing:** Manual (2 week avg. ±SD): 18.7±8.8; OBT = 10.3±3.3 (45.2% relative reduction p < 0.05);
- **Post brushing:** Manual (2 week avg.): 8.5±4.2; OBT 4.6±1.9 (45.0% relative reduction p < 0.05);
- **p.m. regrowth:** Manual (2 week avg.): 14.9±6.4; OBT = 8.2±3.1 (45.1% relative reduction p < 0.05).

**Conclusion:** OBT toothbrush provided significant improvements in oral hygiene including post brushing and at diurnal plaque regrowth periods – viz. overnight and in afternoon regrowth. The superior efficacy of OBT brush is consistent with previously published studies applying conventional clinical assessments. DPIA is a sensitive methodology for the evaluation of holistic diurnal effects of mechanical and chemotherapeutic hygiene interventions.

**ABSTRACT**

Numerous studies have demonstrated that power toothbrushes can provide improvements in patient hygiene. Objective: In this study we applied a Digital Plaque Image Analysis methodology to measure the effectiveness of a rotation oscillation power toothbrush as compared to manual toothbrush. Methods: Seventeen subjects were preliminarily assigned commercial tubes of Crest® Cavity Protection dentifrice and an Oral-B® manual toothbrush (P35) with instructions for bid brushing morning and evening. Subjects remained on CCP dentifrice for two weeks during which they were imaged on 3 days each including assessments of pre brush a.m.; post brush a.m. and p.m.; plaque regrowth respectively using standardized UV imaging techniques (White et al. J Clin Perio 29:39-54, 2002). At week 3, subjects replaced their manual brush with a rotation oscillation power toothbrush (Oral-B® Triumph™ - OBT) – supplied with a detailed instruction/training video to assist in education and compliance with recommended power brush regimen. Plaque was evaluated for an additional week with 3 repeat assessments at like timings. Plaque results are reported as average plaque area coverage on dentition.

**RESULTS**

<table>
<thead>
<tr>
<th>Measurement Point</th>
<th>Manual Toothbrush (2 week avg. ±SD)</th>
<th>OBT Toothbrush (2 week avg.)</th>
<th>% Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre brushing</td>
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</tr>
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</tr>
</tbody>
</table>

**CONCLUSION**

- Triumph toothbrush provided statistically significant reductions in post brushing plaque, pre brushing plaque a.m. and in p.m. plaque regrowth as compared with a manual toothbrush.
- DPIA technique proved to be a sensitive method for the quantitative assessment of mechanical antiplaque effects provided by power assisted toothbrushes.

**MATERIALS AND METHODS**

**INTRODUCTION**

Research supports the superior efficacy of power assisted toothbrushes in the removal of dental plaque and maintenance of gingival health. The assessment of comparative hygiene benefits of manual and power assisted brushes is complicated by conventional categorical plaque indices which show limited sensitivity as brushing efficiencies increase. The Digital Plaque Image Analysis technique has proven a valuable clinical methodology in assessments of benefits of toothbrushing and chemotherapeutic antiplaque agents. The technique permits objective assessments of diurnal plaque coverage on the dentition.

This study examined the clinical efficacy of a power assisted toothbrush, Oral-B Triumph – based upon a novel rotating oscillating cleaning on dental plaque formation and removal assessed by DPIA.