A comparison of two electric toothbrushes with respect to plaque removal and subject preference

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Objectives
To compare the Braun Oral-B 3D Plaque Remover with that of the sonicare electric toothbrush with respect to safety, plaque removal efficacy and subject preference.

Design
Randomized, split-mouth, post-brushing, single-blind to the investigator

Materials and Methods
Forty-four subjects (M = 18, F = 26), with a mean age of 36.6 years (range, 22-60 years), were recruited to the trial. They were all in good general health, with a minimum of 20 scorable teeth (not including 3rd molars, teeth with bridges, crowns or implants). Exclusion criteria included pocket depths > 5 mm, and current use of an electric toothbrush.

At an initial visit, subjects received a baseline oral soft tissue examination and were instructed in the use of both the Braun Oral-B 3D Plaque Remover and sonicare Plus toothbrushes. Subjects used each device twice daily on alternate days over a 4-week practice period and were re-evaluated for brushing technique after 2 weeks of this practice period. Subjects then abstained from any form of oral hygiene for 48 hours, after which two quadrants of the mouth (Q1 and Q3 or Q2 and Q4) were each randomly assigned to be cleaned with one of the devices. Subjects brushed under supervision for 2 minutes, using each toothbrush for 60 seconds (30 seconds per quadrant). Plaque was assessed and oral soft tissues were examined for safety before and after brushing. Plaque was evaluated after using a disclosing solution and recorded as the presence or absence of plaque in 9 areas of each tooth, as specified in a refinement of the Modified Navy Plaque Index. To avoid carry-over effects, surfaces scored for both maxillary and mandibular central incisors were excluded from the analyses. All clinical measurements were made by one examiner. At the end of the test period, subjects were asked to complete a product evaluation questionnaire.

The plaque reduction efficacy of the toothbrushes was calculated by subtracting the post-brushing Mean Plaque Index (MPI) from the pre-brushing MPI. The two toothbrushes were compared by performing a paired t-test on the pre- and post-brushing difference scores.

Results

Percentage reduction in plaque after 2 minutes brushing

<table>
<thead>
<tr>
<th></th>
<th>All sites combined</th>
<th>Marginal sites</th>
<th>Approximal sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>3D</td>
<td>67*</td>
<td>50</td>
<td>87*</td>
</tr>
<tr>
<td>Sonicare</td>
<td>43*</td>
<td>23</td>
<td>68</td>
</tr>
</tbody>
</table>

*Statistically significant difference in favour of the 3D, p=0.001
Both the Braun Oral-B 3D Plaque Remover and the sonicare toothbrush were found to be safe and to effectively remove plaque, the reduction from pre- to post-brushing plaque scores being statistically significant in both groups, for all sites (p=0.001). A comparison of the two toothbrushes, however, revealed that the 3D was consistently more effective than the sonicare toothbrush, the difference in all cases being statistically significant (p=0.001). For all sites combined, the 3D reduced the plaque index by 67% from 0.67 to 0.22, compared with a reduction of 50% from 0.68 to 0.34 with the sonicare toothbrush. For approximal sites, the 3D removed 87% of plaque compared with 68% for sonicare. The greatest difference between the two brushes was observed at marginal sites where the 3D reduced plaque by 43% compared with 23% for sonicare.

Evaluation of subject attitudes to the two toothbrushes revealed a clear preference for the 3D, with 88% preferring the 3D over sonicare (p=0.001). Out of a total of 15 product characteristics, subjects expressed a statistically significant preference for the 3D in 12 cases.

Clinical Comment
This study is in agreement with the results from other studies which have shown the superiority of the Braun Oral-B range of electric toothbrushes over the sonicare toothbrush. With respect to plaque removal, the new Braun Oral-B 3D Plaque Remover was found to be significantly more efficient than sonicare at all sites evaluated. This study used the Modified Navy Plaque Index to assess plaque, as this index allows the efficiency of a brush at different sites on the tooth surface to be more readily compared. The results confirm the efficacy of the 3D at approximal sites where it was anticipated that the additional pulsating action of the 3D would lead to greater efficacy. At these hard to reach sites the 3D removed almost 30% more plaque than the sonicare toothbrush. The study also confirmed the clear preference that subjects have for the Plaque Remover, with 88% preferring the 3D over sonicare Plus. This finding may be important with respect to long-term compliance.