Study on the effectiveness of an electric toothbrush (Braun Oral-B D5) for plaque removal and gingival improvement compared to a manual toothbrush (Butler GUM 211)

Hanioka, T., Tanaka, M., Shizukuishi, S., Osaka University, Japan
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Objectives
To compare the effect of an electric toothbrush (Braun Oral-B Plaque Remover) (D5) with a manual toothbrush (Butler GUM 211) in controlling plaque and improving gingivitis.

Design
Crossover study, single blind to investigator.

Materials and Methods
Fifteen volunteers aged between 20 and 28 years, with no prior expertise in oral hygiene were selected for the study. All subjects were given a dental scaling three months prior to entry into the study.

Volunteers were assessed using representative teeth, as proposed by Ramfjord. Where a tooth was missing or restored at the gingival level, the next distal tooth was selected.

The following indices were assessed:
- Plaque Control Record (O’Leary)
- Plaque Index (Turesky modification of Quigley and Hein)
- Plaque Index (Modified Gingival Index, Lobene)
- Gingival Bleeding Index (Ainamo & Bay)

Volunteers were instructed in brushing technique, the manual group were shown the "Scrub Technique" and the electric toothbrush group was shown the manufacturer’s instructions. Volunteers were asked to brush for two minutes, twice a day and not to use any additional oral hygiene aids.

Assessment was at baseline, three weeks and six weeks. Following each assessment, volunteers were asked to brush their teeth again. Precautions were taken to prevent disclosed plaque from being visible and an additional post brushing score was recorded.

Tooth and soft tissue abrasion was also noted at baseline and again at six weeks.

Following the first study period a seven week interval off-trial was implemented prior to the volunteers being crossed over into the second arm of the study where they used the alternative toothbrushing regime.

Results

<table>
<thead>
<tr>
<th>Plaque Index</th>
<th>Braun Oral-B D5 n = 15</th>
<th>Manual Toothbrush Butler GUM 211 n = 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Brushing - Plaque Control Record, O’Leary</td>
<td>70.7</td>
<td>56.5*</td>
</tr>
<tr>
<td>66.4</td>
<td>63.6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gingival Index</th>
<th>Braun Oral-B D5 n = 15</th>
<th>Manual Toothbrush Butler GUM 211 n = 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Brushing - Modified Gingival Index, Lobene</td>
<td>1.83</td>
<td>1.64*</td>
</tr>
<tr>
<td>1.90</td>
<td>1.79</td>
<td></td>
</tr>
</tbody>
</table>

*Statistically significant difference between groups (p<0.05).
Results
Both the manual toothbrush group (Butler GUM 211) and the electric toothbrush group (Braun Oral-B D5) showed an improvement in Plaque scores over the six week study periods, however the electric toothbrush was significantly better than the manual toothbrush in removing plaque.

There was a statistically significant improvement in the Gingival Bleeding Index between baseline and six weeks in favour of the electric toothbrush. In the initial period the manual toothbrush improved gingival index from baseline but failed to do so in the second period.

There was no difference in terms of hard and soft tissue abrasion between the systems overall, although some gingival bleeding was observed in the electric toothbrush group in the first two weeks.

Clinical Comment
This cross study demonstrated that the electric toothbrush (Braun Oral-B D5) was significantly better than the manual toothbrush (Butler GUM 211) in removing plaque and improving gingivitis during a six week period.

Both systems improved the indices from base line apart from a gingivitis improvement in the manual toothbrush group during the second arm of the study. This was due to the electric toothbrush having been used first by that group and a significant improvement already having been achieved in gingivitis.

There was no difference in terms of hard or soft tissue abrasion.

The Braun Oral-B Plaque Remover (D5) demonstrated safety and superiority to a manual toothbrush (Butler GUM 211) in a six weeks crossover study.