The effect of chewing apples on dental plaque and food debris

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ABSTRACT - The aim of the present study was to assess the cleansing effect of the chewing of apples. The plaque situation in 47 children 12 years of age was assessed by the Plaque Index System. Judging from plaque incidence values, the chewing of apples had no cleansing effect on moderate amounts of plaque. A similar experiment with 57 children of the same age showed, however, that food debris was removed by chewing apples.

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The chewing of hard fruits and vegetables has been assumed to cleanse the teeth. Judging from experimental studies in adults, however, the chewing of fibrous food seems neither to affect the amount of dental plaque formed within 18 days nor the gingivitis which develops in the absence of active oral hygiene. Regular chewing of apples, on the other hand, has been found to reduce gingival disease in children, but deposits at the gingival margin were not assessed. Since there is a causal relationship between plaque and gingivitis, the apparent discrepancy between the findings in adults and children may be related to the amount of plaque at the gingival margin.

Plaque and gingivitis have been recorded frequently in Norwegian children. The present study was conducted to assess a possible cleansing effect of apple chewing on the amount of plaque in children. Furthermore, the effect of this procedure on the oral clearance of food particles was evaluated.

MATERIAL AND METHODS

The material comprised 12-year-old children attending primary schools in Porsgrunn, Norway. Children with orthodontic appliances were excluded.

Effect on plaque. The plaque situation of 47 children was assessed by the Plaque Index System. The maxillary and mandibular first molars and the incisors were recorded, i.e. 48 recordings in each child.

One day after this initial plaque scoring, 24 children (the apple group, chosen at random among the participants) were asked to eat a whole unpeeled apple and then to rinse the mouth with tap water. Immediately after this procedure, the plaque situation was re-scored. Twenty-three children (the control group) only rinsed with tap water before the re-examination. The children performed their conventional oral hygiene between the recordings.

RESULTS AND DISCUSSION

Effect on dental plaque. The mean initial frequencies of the plaque Score 2 were 51% and 52% of the total number of the plaque scores (Table 1). No areas were assigned Score 3. Judged by the initial frequencies of the Score 2, there was no significant difference in amount of plaque between the groups (t = 0.52, d.f. = 45). The same frequencies of
Table 1. Percentage frequencies (mean ± s.d.) of Plaque Index Scores 0 and 2 at the initial recording of 12-year-old children (48 PI I scores per child)

<table>
<thead>
<tr>
<th>Group</th>
<th>Score 0</th>
<th>Score 2</th>
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<tbody>
<tr>
<td>Apple (n = 24)</td>
<td>7 ± 9</td>
<td>52 ± 26</td>
</tr>
<tr>
<td>Control (n = 23)</td>
<td>8 ± 10</td>
<td>51 ± 27</td>
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Table 2. Effect of chewing apples on plaque and on food debris. The incidence of plaque expressed by the difference between the frequencies of Plaque Index Score 2 at two observations

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean no. (±s.d.) of differences of Score 2</th>
<th>Mean no. (±s.d.) of tooth surfaces with food debris</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>0.8 ± 6 (n = 24)</td>
<td>2 ± 6 (n = 27)</td>
</tr>
<tr>
<td>Control</td>
<td>0.3 ± 7 (n = 23)</td>
<td>26 ± 16 (n = 30)</td>
</tr>
</tbody>
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the Score 2 at the two examinations of the control group (Table 2) confirm findings in this type of material, i.e. the experimental design seems suitable for evaluating a possible effect on alterations in the plaque situation. When the frequencies of Score 2 of each individual were compared, the succeeding intergroup comparison indicated no significant difference in the incidence of plaque (t = 0.06, d.f. = 45). That chewing apples had no cleansing effect on moderate amounts of plaque confirms the findings in adults. The favorable effect of apple chewing on gingival disease observed by SLACK & MARTIN may be ascribed to their material and their methods.

Effect on food debris. The children who ate the apples had significantly fewer food particles on their teeth than the control group children (Table 2). The findings are in agreement with the cleansing effect of chewing apples after subjects had eaten a cake made with yeast. In addition, chewing apples accelerates the oral sugar clearance.

The primary effect of chewing apples is the effective removal of food debris (e.g. refs. 5, 11) since plaque remains on the teeth. These facts, however, may justify ending a meal with an apple.

REFERENCES


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