A pilot study on the effects of the toothpaste on reducing dentine hypersensitivity.

Introduction Short, sharp pain due to dentine hypersensitivity is the most common type of pain in the facial area. Approximately from 8 to 50 per cent of the population suffer from dentine hypersensitivity. The areas, which are most affected, are the facial surfaces of the premolars and canine teeth.

The purpose of the study was to determine how the toothpaste impacts the sensitivity of teeth, gingival bleeding (BOP) and plaque in the study subjects.

Methods and Material

Study subject’s history
- Type of pain (short, sharp, etc.)
- Pain stimulus (temperature, contact, air)
- Study subject’s willingness to participate in the treatment period
- Study subject’s diet (acidic products, fruit, wine, cider etc.)

Diagnostics
- Air blast
- Temperature test (ice water)
- VRS (Verbal Rating Scale)

Study subject examination
- Exclusion of causes other than dentine hypersensitivity
- Examination of the exposed dentine
- Examination of the connection between the stimulus and pain

Decision on the treatment period
- Verification of the pain sensation and deciding on the treatment period

Results

Table 1. Description of the study group

<table>
<thead>
<tr>
<th>Subject</th>
<th>Three-week treatment period</th>
<th>Final examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1 male, 1 female</td>
<td>1 male</td>
</tr>
<tr>
<td>Age</td>
<td>20-26</td>
<td>20-26</td>
</tr>
</tbody>
</table>

Table 2. Averages and standard deviations before and after the use of toothpaste

<table>
<thead>
<tr>
<th>Sensitivity test</th>
<th>Pre-treatment</th>
<th>Post-treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale 1</td>
<td>6.2</td>
<td>3.8</td>
</tr>
<tr>
<td>Scale 2</td>
<td>6.1</td>
<td>3.7</td>
</tr>
<tr>
<td>Scale 3</td>
<td>6.0</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Discussion

The number of sensitive teeth decreased, the intensity, degree and duration of pain were reduced as a result of the use of the toothpaste. The results were positive also in terms of the plaque biofilm and gingival bleeding.

The results are similar to earlier studies, in which reduction of dentine hypersensitivity has been observed in connection with the use of toothpaste containing potassium chloride. (Silverman et al. 1994, Cummins 2009, Poulsen et al. 2006.)

Conclusion

The study provided new information on the effect of an ecological and fluoride-free toothpaste on dentine hypersensitivity.

References

The reliability of the study was increased by the researcher, method and material. The study subject group consisted of young and elderly persons, mainly women (n=14). One person had to withdraw from the study after the initial examination in the beginning of the treatment period. The duration of the treatment period was three weeks. The main ingredient reducing pain associated with dentine hypersensitivity in the ROCS Bionica Sensitive® toothpaste is potassium chloride. The results were obtained by dental hygienist students at the end of their studies under the supervision of instructors, by means of examinations, questionnaires, journals and case history information.

The ROCS Bionica Sensitive® toothpaste reduced dentine hypersensitivity in the study subjects, measured using objective and subjective indicators. The number of sensitive teeth decreased, the intensity, degree and duration of pain were reduced as a result of the use of the toothpaste. The results are similar to earlier studies, in which reduction of dentine hypersensitivity has been observed in connection with the use of toothpaste containing potassium chloride. (Silverman et al., 1994; Cummins, Pauleen et al., 2006.) The ROCS Bionica Sensitive® toothpaste used in the test does not contain fluoride, so the study provided new information on the effect of an ecological and fluoride-free toothpaste on dentine hypersensitivity.

The results were positive also in terms of the plaque biofilm and gingival bleeding: both indicators showed clear signs of reduced dentine hypersensitivity following the use of the toothpaste. The results obtained for these two indicators are similar to those achieved in earlier studies. (Clf. Kumar et al., 2009; Sarap et al., 2012; Charantimath & Oswal 2011.) The ROCS Bionica Sensitive® toothpaste contains clove and liquorice extract, among others, and these have been shown to reduce plaque and inflammation.

The study provided new information on the user experiences and properties of the toothpaste. It can be concluded that nearly all of the study subjects, who were used to using regular "basic toothpastes", were satisfied with the ROCS Bionica Sensitive® toothpaste used in the study. Thus, the toothpaste can be recommended for individuals suffering from dentine hypersensitivity, who want to make ecological choices. The sustainable ecological approach covers the entire product, including packaging and appearance.

The reliability of the study was increased by the researcher, method and material triangulation. Due to the small target group of the study, the study can be considered a pilot study. The treatment period of three weeks can also be considered to be too short for achieving results. The most common duration of the treatment periods of dentine hypersensitivity studies has been 4 to 8 weeks. In addition, different studies have focused on toothpastes with different ingredients and also with fluoride, and this makes comparisons between studies more difficult (Karim & Gillam 2013; Hooper, S., et al, 2014; Walters, P.A. 2005.). The results benefit both oral care professionals, who have an important role in guiding clients in various issues concerning oral health, and ecologically conscious persons who, for example, want to use a fluoride-free toothpaste.

In the future, the ROCS Bionica Sensitive® toothpaste should be studied using a comparative research frame and a larger number of study subjects.