EFFECT OF TOOTHPASTE IN REDUCING DENTINE HYPERSENSITIVITY

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ABSTRACT

The present study was conducted at Khyber College of Dentistry during the year 2014 with the aim to investigate dentine hypersensitivity (DH), one of an unpleasant condition experienced by young to middle age people which restricts the daily drinking/eating habits of patients. For this purpose fifty patients (25 male, 25 female) were randomly selected and examined for sensitivity. The patients were divided into 2 groups i.e. treatment (Sensodyne Rapid action tooth paste) and control (Colgate total care tooth paste). The patients were given blast of air for 10 seconds and tooth sensitivity was evaluated by Visual analogue scale. Statistical analysis of the data revealed that all of the subjects patients had DH due to periodontal problem/attachment loss. Results indicated that regular use of desensitizing tooth paste drastically reduced dentine hypersensitivity when compared to the daily use tooth paste (control).

Key Words: Dentine hypersensitivity (DH), Attachment loss, Toothpaste. Visual analogue scale (VAS).

INTRODUCTION

Dentin hypersensitivity (DH) is a brief and acute pain produced when dentin is subjected to chemical, osmotic, thermal, tactile or evaporative stimuli. It has been reported that the acute pain is actually a normal pulpal response to the uncovered dentine and patients with periodontal diseases are particularly at high risk (70%) of experiencing DH. The exact mechanism of dentin hypersensitivity is still unknown, however, it is reported that the main cause of DH is due to change in the flow of fluid in dentinal tubules that can trigger pain receptors available on nerve endings in the pulpal part. The hydrodynamic flow is usually increased due to fluctuations of humidity, temperature, osmotic and air pressure, or forces acting on the tooth exterior. Cold or hot foods, drinks and physical pressure usually trigger people with dentin hypersensitivity. It has been estimated that about 30% of adults of the 40 million people in the US at one time of their life are encountered with dentine hypersensitivity. A large difference in the reported prevalence of dentine hypersensitivity ranging from 1.1% to 98% has been related to different methods adopted by various studies. According to scientific consensus, from 10% to 30% of the universal population are affected with this condition.

DH can affect a person of any age, however, most likely susceptible people are in the age group of 20-49 years with peak hypersensitivity between 30-39 years. Dental literature suggests that dentin hypersensitivity usually occurs among people of 30 to 40 years. Similar to any other clinical condition, an accurate diagnosis is crucial before managing DH.

Currently various options exist for the treatment of DH including professional and at home remedies. Professional treatment is usually invasive and includes the use of lasers for reducing DH in modern dental practice, mucogingival surgery/grafting procedure and different topical agents applied in clinic such as resins and bonding agents. The home remedy includes use of desensitizing tooth paste. An easy clinical method of diagnosing DH includes a blast of air and using investigative probe on the uncovered dentin in mesiodistal direction, examining all teeth in the area where the patient experiences pain. The severity or degree of pain can be quantified either according to categorical scale (i.e., slight, moderate or severe pain) or using a visual analogue scale.

METHODOLOGY

The present study was carried out at the Department of Periodontology, Khyber College of Dentistry, Peshawar, KPK, Pakistan. Approval was obtained from the Ethical committee of Khyber College of Dentistry, Peshawar. Before treatment each participant was explained the purpose and procedures of the study and an informed consent was obtained. Inclusion criterion included patients having 4 mm attachment loss while exclusion criteria was patients who had received non-surgical periodontal therapy within the last three months, received medicine for any medical problem during the last three months, having a carious tooth or defective restoration and Para functional habits.
Reducing dentine hypersensitivity

acetate and 1040 ppm fluoride as NaF in a silica base currently marketed as Sensodyne Rapid action tooth paste (Glaxo Smithkline Pakistan) to rub over all the teeth with finger, wait for 3 minutes and then use soft tooth brush to clean the teeth. Visual analog scale was recorded at day 1 (baseline) and patients were recalled for measuring DH after one, two and three weeks after use of recommended tooth paste. Statistical analysis was carried using SPSS version 16 to calculate standard deviation and standard error. For difference in scores between two the groups, independent sample-t test was used.

RESULTS

The data indicated that the overall reduction in dentin hypersensitivity measured in terms of the Visual Analog Scale (VAS) for all the patients in the present study was statistically significant (Tables 1 and 2). Analysis of the data revealed that after the use of desensitizing tooth paste, all the patients showed less dentin sensitivity-related pain after 3-weeks follow-up compared to the baseline. Data shown In Table 1 revealed that different treatment group showed marked differences in their scores for dentin sensitivity-related pain when independent sample-t test was used.

The pain level for control group A was higher than treatment group B even after 3 weeks of continuous use of Colgate total care tooth paste. The mean values of the data suggested that pain was high in treatment group B on day 1 (5.20), however, data recorded after one week of treatment revealed a reduction in the pain level (3.77) and three weeks after treatment it was 1.21 when compared with control group (2.31) (Table 1).

The data shown in Table 2 revealed the effect of duration on DH when measured by VAS. It is clear from data shown in Table 2 that the VAS on day 1 for group A was less (4.27) compared to group B (5.26) with the difference of 0.54. After 3 weeks of treatment, the VAS for group A reduced to 2.13 compared to group B with marked reduction in VAS of 1.13. These results

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\begin{array}{|c|c|c|c|}
\hline
\text{Treatment period} & \text{Treatment groups} & \text{Mean VAS} & \text{Std. Deviation} & \text{Std. Error} \\
\hline
\text{Day 1} & \text{Total care T/Paste} & 4.7200 & 0.94847 & 0.13413 \\
& \text{SensodyneR /A T/paste} & 5.2600 & 1.174 & 0.16613 \\
\text{Week 1} & \text{control} & 4.0400 & 0.90824 & 0.12844 \\
& \text{Treatment} & 3.7700 & 1.05565 & 0.14929 \\
\text{Week 2} & \text{control} & 3.3100 & 0.63800 & 0.09023 \\
& \text{Treatment} & 2.6400 & 0.71457 & 0.10106 \\
\text{Week 3} & \text{control} & 2.3100 & 0.66922 & 0.09464 \\
& \text{Treatment} & 1.2100 & 0.47477 & 0.06714 \\
\hline
\end{array}
\]
TABLE 2: EFFECT OF DURATION ON DH MEASURED WITH VAS

<table>
<thead>
<tr>
<th>Duration</th>
<th>Group A (VAS)</th>
<th>Group B (VAS)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>4.27</td>
<td>5.26</td>
<td>0.54</td>
</tr>
<tr>
<td>Week 1</td>
<td>4.04</td>
<td>3.77</td>
<td>-0.27</td>
</tr>
<tr>
<td>Week 2</td>
<td>3.31</td>
<td>2.61</td>
<td>-0.67</td>
</tr>
<tr>
<td>Week 3</td>
<td>2.13</td>
<td>1.13</td>
<td>-1.1</td>
</tr>
</tbody>
</table>

TABLE 3: MEAN AGE OF MALES AND FEMALES

<table>
<thead>
<tr>
<th>Gender</th>
<th>Mean</th>
<th>Number of patients</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>40.2800</td>
<td>25</td>
<td>10.17972</td>
</tr>
<tr>
<td>Female</td>
<td>38.2800</td>
<td>25</td>
<td>7.89789</td>
</tr>
<tr>
<td>Total</td>
<td>39.2800</td>
<td>50</td>
<td>9.07349</td>
</tr>
</tbody>
</table>

demonstrated that the use of Strontium Acetate tooth paste for three weeks drastically reduced the VAS from 5.26 to 1.21 compared to Sodium fluoride tooth paste for the same period of treatment (Table 2).

The data indicated that the mean age of males was 40.28 with standard deviation of 10.17 and females were having 39.28 with standard deviation of 7.89 years where as average age of all the participants were 39.28. The data shown in Fig 1 indicated that the VAS for male was 5.2 compared with females (4.32) on day 1. The data further suggested that treatment up to three week reduced VAS from 5.2 in males to 1.22 on week while the same period revealed reduction of VAS in females from 4.32 to 2.4.

DISCUSSION

Presently people are trying to retain their teeth for longer due to better dental health facilities; therefore, it is reasonable to expect that there seems to be higher incidence of complaints related to dentin hypersensitivity resulting in an increase of patients for its treatment. The mean data suggested that the pain was high in patients who were given different treatment on day 1. However, the follow up examination indicated that from week 1 onward up to week 3, the pain gradually decreased due to treatment with different brands of tooth paste. The data also showed that Strontium acetate 8% was more effective to reduce the pain compared with Colgate total care 0.24% (0.14% w/v fluoride ion) used by control group. The data also suggested that pain level for control group was higher than treatment group. The present results indicated that patients under study demonstrated significant reduction in sensitivity to thermal stimuli. Similar results were also reported by Parkinson et al. who demonstrated reduction in dentine hypersensitivity after the use of Strontium acetate tooth paste by occluding the dentinal tubules and withstanding acid erosion. Mason et al. concluded that the efficiency of tooth paste containing 8% Strontium acetate was more, than tooth paste containing Sodium fluoride when evaluated for six weeks, however, our study was carried out for 3rd weeks. The present study could not be extended beyond 3rd week due to non-availability of the subject patients. Gillam and Orchardson also reported that increased concentration of fluorides can reduce dentine hypersensitivity probably through precipitation of calcium fluoride globules within the dentine tubules and that may be reason of reduction of DH in group A because Colgate total care contains Sodium Fluoride 0.24% (0.14% w/v fluoride ion). The results also suggested that the mean age of all participants was 39.28 years. These results are also supported by different researchers who concluded that DH increased between the age of 30 to 40 and then decreased. This study also indicated that males were having average age of 40.28 and females 38.28. The data showed more DH for male compared with females on day 1. However, treatment for three weeks drastically reduced DH in males than female. These results do not agree with Amarasena et al, who concluded that females are more affected than males, however, these differences are statistically non significant. Despite the fact that there is little evidence confirming the edge of one toothpaste over the other, yet, desensitizing tooth paste provides relief in overcoming the problem.

CONCLUSION

From the present study it can be concluded that the use of desensitizing tooth paste at home is a simple remedy. Application of Sensodyne rapid action tooth paste was more effective to control DH when compared with Colgate total care tooth for the same period of time.

REFERENCES

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Reducing dentine hypersensitivity