Objective: The aim of this study was to compare the antimicrobial efficacy of two commercially used toothpastes.

Methods: The two toothpastes used in the study were Fluoride containing toothpaste (Group A) and Herbal toothpaste (Group B) at various concentrations in salivary samples of children in the mixed dentition age group. The antimicrobial activity was assessed by measuring the inhibition zones by agar well diffusion method. Saliva was collected from children of age group 6-12 years having high caries activity.

Results: The results suggested that Fluoridated toothpaste had maximum antimicrobial activity at all concentrations when compared to Herbal toothpaste which was statistically significant when tested with ANOVA and Post hoc test.

Conclusion: The higher antimicrobial activity of fluoride containing toothpaste could be attributed to the presence of different components like triclosan and fluoride.

Keywords: Toothpaste, Fluoride, Antimicrobial, Herbal.
compared to herbal toothpaste with a mean zone of inhibition of 14.4mm, 17.5mm respectively (Tables 1, 2 and figures 1 and 2). When the results were subjected to ANOVA and post hoc tests the results showed that fluoride containing dentifrice had zones of inhibition which were significantly higher than the other two groups at all concentrations (Tables 1, 2 and figures 1 and 2).

Table 1: Comparison of antimicrobial activity at 25% in study groups

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Antimicrobial activity at 25%</th>
<th>F value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoride toothpaste</td>
<td>mean – 14.4 SD – 3.34</td>
<td>4.92</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Herbal toothpaste</td>
<td>mean – 10.7 SD – 2.54</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P=0.015 Fluoride toothpaste Vs Herbal toothpaste: P<0.05

Table 2: Comparison of antimicrobial activity at 50% in study groups

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Antimicrobial activity at 50%</th>
<th>F value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoride toothpaste</td>
<td>mean – 17.5 SD – 4.01</td>
<td>3.67</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Herbal toothpaste</td>
<td>mean – 13.5 SD – 2.79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P=0.039 Fluoride toothpaste Vs Herbal toothpaste: P<0.05

Table 3: Comparison of antimicrobial activity at 100% in study groups

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Antimicrobial activity at 100%</th>
<th>F value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoride toothpaste</td>
<td>mean – 21.8 SD – 3.56</td>
<td>7.28</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Herbal toothpaste</td>
<td>mean – 16.3 SD – 2.49</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P=0.003 Fluoride toothpaste Vs Herbal toothpaste: P<0.005

DISCUSSION

Fluoride containing toothpaste due to the triclosan/copolymer along with the 1000ppm Fluoride provides a more effective level on plaque control and periodontal health than conventional fluoride toothpaste [8]. It has been suggested that triclosan blocks lipid biosynthesis by specifically inhibiting the enzyme enoyl-acyl carrier protein reductase (ENR). This feature of fluoride toothpaste can be attributed to the antimicrobial efficiency. Although the commonly used and recommend toothpastes by WHO, ADA, FDI is the fluoride and triclosan containing. But the excess use of the fluoride can cause the dental fluorosis so the recommended amount of the fluoride should be used as the ingredients in the toothpaste. The fluoride tooth paste reduces the number of streptococcal colony forming units of dental plaque despite the fact that fluoride was added to the toothpastes first with aiming to preserve the product and then to protect the teeth [9]. The effectiveness of fluoride toothpastes as an antimicrobial agent is concentration dependent.

Using natural medicines to cure various diseases has become an increasing trend. Herbal medicine has made significant contribution to modern medical practice [10]. The antimicrobial activity of the herbs is due to the presence of secondary metabolites such as alkaloids, flavonoids, polyphenols, and lectins [11]. Synergistic interactions between the principal components of these herbs are considered to be a vital part of their efficacy. This synergistic activity, however, needs to be established. Many studies on herbal base toothpaste in control of plaque and gingivitis are reported. Herbal toothpaste however showed the least zones of inhibition at all concentrations.

CONCLUSION

The level of pathogenic organisms in the oral microbiota is one of the etiological factors for dental caries and other periodontal diseases. There are a number of toothpastes available in the market that claim to have antimicrobial potential. This study has proved that the fluoridated toothpaste remains a gold standard as far as
antimicrobial efficacy is concerned. However, it must be recognized that 1000 ppm fluoride containing toothpastes are not recommended for children. Herbal tooth paste also showed antimicrobial properties and is a herbal product; thus reducing the chances of fluoride toxicity.

REFERENCES