abstract: Azadirachta indica (neem) is a plant of Meliaceae family, has been used in India for several decades in medical and dental sciences for the treatment of several diseases. Neem has been considered to have antiseptic activity, but its use in the dentistry for the treatment of gingivitis and periodontitis has not been well established till date. Therefore, the purpose of the present study was to assess the efficacy of neem extract (nimbidin-T) as an antigingivitisagent. Thirty dental students were enrolled for the study. A nimbidin-T preparation was applied by the operator twice a day, once in the morning and second time in the evening with small cotton pellet for two months. Gingival status was assessed by loe and sillness gingival index at base line and on 2nd day, 4th day, 8th day and then every week till two months. Results showed that nimbidin-T is significantly effective in reduction of dental plaque induced gingivitis concluding that it may be used as an effective adjunctive therapy to conventional mechanical therapy in treating dental plaque induced gingivitis.

key words: Azadirachta indica, Neem, antigingivitis, Nimbidin-T

introduction

Periodontal disease is characterized by inflammation of the supporting tissue of the teeth followed by their destruction. The most effective methods of prevention and maintenance of periodontal disease are mechanical and chemical plaque control (Botelho et al., 2007). Many chemical agents (Patters et al., 1986), were tried for the control of plaque and maintenance of normal gingival health but some of these chemical agents produce toxic effect to the human body (Slee et al., 1971). Attempts have been made to explore the phytochemicals from the medicinal plants in the prevention and treatment of periodontal diseases.

From centuries medicinal plants have been used for the cleaning of teeth throughout the world. In South East Asia as studied by (Almas, 2001) and in African countries by (Elvin -Lewis and Lewis, 1984) that green twigs of the medicinal plants (eg. Datun) are still in practice especially in the rural areas. Amongst them Azadirachta indica (Silva and Nayak, 1980) and Acacia (Clark et al., 1993;) are commonly used. (Rathje, 1971) used leaf extract of Azadirachta indica where as (Saimbi et al., 1986) used acacia for the control of plaque and found very encouraging results. In earlier study (Saimbi and Singh, 1986) a 1% concentration of Nimbidin-T preparation exhibited potential anti-plaque activity. The antibacterial activity of neem has been evaluated and known from ancient times (Chawla et al., 1994). The possible mechanism of anti inflammatory action of neem is by inhibiting prostaglandin E and 5 HT and thus reducing the inflammation. The antibacterial action can be explained by "Azadichitin" that is known to destroy bacterial cell wall and thus inevitably inhibit the growth of bacteria (Trewari, 1992) and the breakdown of cell wall disturb osmotic pressure and leads to cell death( Robinson,1995). But still, its use in the dentistry for the treatment of gingivitis and periodontitis has not been well established till date. Therefore, the purpose of the present study was to assess the efficacy of neem extract (nimbidin-T) as an antigingivitis agent.

material and methods

The present study was conducted in the department of Periodontology, Faculty of Dental Sciences, King George’s Medical University, Lucknow. Thirty dental students aged between 18-24 years of both the sexes were enrolled in this clinical trial. Inclusion criteria were subjects having complete set of teeth except third molars and mild to moderate gingivitis.

Nimbishop was prepared from the kernel of Azadirachta indica. The kernels of Azadirachta indica were finely ground and treated with 95% alcohol and percolated under reduced pressure. The extract obtained was cooled and filtered. The filtered solution was subjected to crystallization to separate Nimbin and fat. The residue extract after crystallization was treated with 60% alcohol to get Nimbidin-T. Nimbidin-T was dissolved in propylene glycol to get 1% concentration of it.

At the beginning of the clinical trial, gingival status was assessed by gingivitis index (Loe and Sillness, 1963) which was taken as 'Baseline gingivitis score'. Oral prophylaxis was performed upon each subject and their dentition was made plaque free by thorough brushing and polishing by the operator. After that the Nimbidin-T trial was started. 1% Nimbidin-T preparation was applied by the operator at 8:30 AM and 4:00 P.M. daily and gingivitis index was scored on 2nd day, 4th day, 8th day and then every week till two months. Small cotton pellets saturated in the test solution were applied over the gingiva and effect of 1% Nimbidin-T preparation was observed on gingivitis for two months. The subjects were allowed to continue their routine oral hygiene measures during the experimental period.

results

Statistically significant reduction in gingivitis was seen from the day 2 itself (p<0.01). On the 2nd day only 12.79% mean reduction in gingivitis scores with range of 5.69% to 22.00% was recorded. However on the 4th and 8th day 15.19% and 35.20% mean reduction was noted in gingivitis scores with a range of 9.31% to 26.26% and 20.17% to 53.92% respectively, which was statistically highly significant (p<0.01). All the values from 15th day onwards were statistically very highly significant (p<0.001) with 47.79% mean reduction of gingivitis score on 15th day, 62.39% on 22nd day, 64.70% on 29th day, 62.41% on 36th day, 68.39% on 43rd day, 69.11% on 50th day (maximum reduction) and 68.41% on 57th day (Fig.1).
In the present study long term clinical effect of 1% Nimbidin-T preparation was explored against gingivitis for two months. Significant alterations were seen in the gingival status in every subject from 2nd day. Gradual increase in efficacy as regards to gingivitis reduction was observed onwards and was stabilized around 60% with maximum reduction on 50th day at a mean level of 69.08%. This shows Nimbidin-T to be an effective anti-gingivitis agent.

The result of this study showed that Azadirachta indica is a very promising anti gingivitis agent. It can be used as routine adjunct against gingivitis and results did not show any untoward reaction. Nimbidin-T is a safe formulation and as such no staining of teeth or mucosa or any other side effect was observed, but it tastes bitter. Nimbidin-T is clinically effective anti-gingivitis agent and could be considered as a potent adjunct to oral hygiene. However, further exploration of Nimbidin-T effect on large number of sample and the microbiological assessment of gingival status will be more meaningful.

References


Fig.1: Diagramatic representation of data (Percentage reduction in gingivitis score with 1% Nimbidin – T application for two months in thirty subjects)