



Review Article

Neem an Ancient Cure for a Dental Diseases: A Mini Review

Dr. Annapurna Ahuja MDS^{1*}, Dr. Vipin Ahuja MDS²

¹Professor & Head Department of Periodontics & Implant Dentistry, Hazaribag College of Dental Sciences and Hospital Demotand

²Professor, Department of Pedodontics and Preventive Dentistry Hazaribag College of Dental Sciences and Hospital Demotand

*Corresponding Author

Dr. Vipin Ahuja MDS

Article History

Received: 27.10.2019

Accepted: 11.11.2019

Published: 20.02.2020

Abstract: The Neem tree (*Azadirachta indica A. Juss.*) has been known as the wonder tree for centuries in the Indian subcontinent. The history of the neem tree is inextricably linked to the history of the Indian way of life. Although the antiquity of neem is shrouded in the mists of time, this evergreen robust looking tree has long been cherished as a symbol of health in the country of its origin. It has, for a very long time, been a friend and protector of the Indian villager. Brihat Samhita, an ancient Hindu treatise, contains a chapter on plant medicines. It contains recommendations for specific trees to be planted in the vicinity of one's house and the neem is highly recommended.

Keywords: Neem tree, Dental Diseases.

Copyright © 2019: This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non commercial use (NonCommercial, or CC-BY-NC) provided the original author and source are credited.

Neem: An Ancient Cure for dental diseases. A review

The Neem tree (*Azadirachta indica A. Juss.*) has been known as the wonder tree for centuries in the Indian subcontinent. The history of the neem tree is inextricably linked to the history of the Indian way of life. Although the antiquity of neem is shrouded in the mists of time, this evergreen robust looking tree has long been cherished as a symbol of health in the country of its origin. It has, for a very long time, been a friend and protector of the Indian villager. Brihat Samhita, an ancient Hindu treatise, contains a chapter on plant medicines. It contains recommendations for specific trees to be planted in the vicinity of one's house and the neem is highly recommended.

Active ingredients of neem

The active principles of the plant were brought to the attention of natural products scientist Salimuzzaman Siddiqui in 1942, who first time extracted three bitter compounds from neem oil - nimbin, nimbinin, and nimbidin[1]; which are involved in antiviral activity, affecting potato virus x,

vaccinia virus(viral disease in cattle), variola (small pox) and fowl pox virus [2, 3].

Medical Properties

According to Noel Vietmeyer, the study director of a 1992 National Research Council report entitled NEEM: A Tree for solving global problems [3]. The medical properties of neem have been known to Indians since time immemorial. Neem fruits, seeds, oil, leaves, bark and roots have such uses as general antiseptics, antimicrobials, treatment of urinary disorders, diarrhea, fever and bronchitis, skin diseases, septic sores, infected burns, hypertension and inflammatory diseases. The essential oil possesses anti bacterial activity. It inhibits the growth of Mycobacterium tuberculosis, salmonella paratyphi, vibrio cholera and klebsilla [2]. Neem possesses strong anti-pyretic compound nimbidin [4].



STUDIES ON NEEM

In vitro studies

The inhibiting effects of aqueous *Azadirachta indica* (neem) extracts upon bacterial properties influencing in vitro plaque formation was studied, this study concluded that neem stick extracts can reduce the ability of some streptococci to colonize tooth surface [5].

The effect of mango and Neem extract on four organisms causing dental caries: *Streptococcus mutans*, *Streptococcus salivarius*, *Streptococcus mitis*, and *Streptococcus sanguis*: An *in vitro* study concluded that Mango extract, at 50% concentration, showed maximum zone of inhibition on *Streptococcus mitis*. Neem extract produced the maximum zone of inhibition on *Streptococcus mutans* at 50% concentration. Even at 5% concentration neem extract showed some inhibition of growth for all the four species of organisms [6].

Leaves, fruits, flowers and stem bark extracts from the Siamese neem tree *indica* A. Juss var. *siamensis* Valetton, Meliaceae) were assessed for antioxidant activity in vitro. The results suggest that extracts from leaf, flower and stem bark of the Siamese neem tree have strong antioxidant potential. This report supports the ethnomedical use of young leaves and flowers of this plant as a vegetable bitter tonic to promote good health [7].

Anticandidal activity of *Azadirachta indica* was tested. *Candida* species tested were those from patients infected with Human Immunodeficiency Virus (HIV). The ethanol extract of commercial neem seed oil, ethanol extract of neem seed kernels and the hexane extract showed best results. All strains were resistant to methanol: chloroform: water extracts and chloroform extracts of the successive extraction procedure. The hexane and alcoholic extracts of neem seed seem to be promising anticandidal agents [8].

Azadirachta indica, a Meliaceae family tree, has been used in India for many years in the treatment of several diseases in medicine and

dentistry. *Azadirachta indica* extract was tested in vitro on strains of *Candida albicans* 12A and 156B. Changes in hydrophobicity were reported in assays of yeast adhesion to hydrocarbons, in biofilm formation with glucose and in the adhesion of the micro-organisms on light cured composite resin. The results suggested that neem leaves have a potential anti-adhesive effect on the samples studied in vitro. Generally, the beneficial effects attributed to the plants may be due to one or more photochemicals, including antioxidants, flavins, and other substances present in the extract [9].

A study conducted in Saudi Arabia to compare the effectiveness of antibacterial of neem (*azadirachta indica*) and Arak (*salvadora persica*) chewing sticks aqueous extracts at various concentrations of 1%, 5%, 10% and 50%. Data suggested that both chewing sticks extracts are effective at 50% concentration on streptococcus mutans and streptococcus fecalis. It was concluded that chewing sticks are recommended as oral hygiene tools for health promotion in developing countries [10].

Animal studies

The water extract of the stem of neem Giloe (*Tinospora cordifolia*), an Indian Indigenous plant, was screened for anti-inflammatory, anesthetic and antipyretic actions in albino rats and immunosuppressive effect in albino rabbits. Water extract of Neem Giloa administered orally and intraperitoneally showed significant reduction in carrageenan-induced inflammation, dose dependent mild analgesic activity was shown by the extract. It also potentiated analgesic effect of morphine. No antipyretic effect was observed [11].

Antibacterial, antisecretory and antihemorrhagic activity of *Azadirachta indica* used to treat cholera and diarrhea in mouse, this study concluded that Oral administration of the extract inhibited hemorrhage induced by *Vibrio cholerae* in mouse intestine at a dose ≥ 300 mg/kg [12].

CONCLUSION

Dental diseases are recognized as major public health problem throughout the world. Numerous epidemiological studies showed that the diseases such as tooth decay and diseases of the periodontium are among the most common afflictions of mankind. Various synthetic chemical agents have been evaluated over the years with respect to their antimicrobial effect in oral cavity; however, all are associated with various side effects. Thus patients are going away of modern day medicines, and they prefer using herbal ayurvedic preparations which are efficient without causing any side effects.

REFERENCES

1. Siddiqui, S. (1942). A note on the isolation of three new bitter principles from the nim oil. *Current Science*, 11(7), 278-279.
2. Cornborough, J. (1994). Neem: An ancient cure for a modern world. *Positive Health: Complementary Health Magazine*.
3. Michael, T. (1994). Environment health perspect, 102(12):1009-1010.
4. Neem: Ultimate healing herb. (2005). The doctors prescription for healthy living; 5:(4).
5. Wolinsky, L. E., Mania, S., Nachnani, S., & Ling, S. (1996). The inhibiting effect of aqueous *Azadirachta indica* (Neem) extract upon bacterial properties influencing in vitro plaque formation. *Journal of dental research*, 75(2), 816-822.
6. Prashant, G. M., Chandu, G. N., Murulikrishna, K. S., & Shafiulla, M. D. (2007). The effect of mango and neem extract on four organisms causing dental caries: *Streptococcus mutans*, *Streptococcus salivarius*, *Streptococcus mitis*, and *Streptococcus sanguis*: An in vitro study. *Indian journal of dental research*, 18(4), 148.
7. Sithisarn, P., Supabphol, R., & Gritsanapan, W. (2005). Antioxidant activity of Siamese neem tree (VP1209). *Journal of Ethnopharmacology*, 99(1), 109-112.
8. Lloyd, A. C., Menon, T., & Umamaheshwari, K. (2005). Anticandidal activity of *Azadirachta indica*. *Indian journal of Pharmacology*, 37(6), 386.
9. Polaquini, S. R., Svidzinski, T. I., Kemmelmeier, C., & Gasparetto, A. (2006). Effect of aqueous extract from Neem (*Azadirachta indica* A. Juss) on hydrophobicity, biofilm formation and adhesion in composite resin by *Candida albicans*. *Archives of oral biology*, 51(6), 482-490.
10. Almas, K. (1999). The antimicrobial effects of extracts of *Azadirachta indica* (Neem) and *Salvadora persica* (Arak) chewing sticks. *Indian journal of dental research: official publication of Indian Society for Dental Research*, 10(1), 23.
11. Pendse, V. K., Dadhich, A. P., Mathur, P. N., Bal, M. S., & Madan, B. R. (1977). Antiinflammatory, immunosuppressive and some related pharmacological actions of the water extract of Neem Giloe (*Tinospora cordifolia*): A preliminary report. *Indian journal of pharmacology*, 9(3), 221.
12. Thakurta, P., Bhowmik, P., Mukherjee, S., Hajra, T. K., Patra, A., & Bag, P. K. (2007). Antibacterial, antisecretory and antihemorrhagic activity of *Azadirachta indica* used to treat cholera and diarrhea in India. *Journal of ethnopharmacology*, 111(3), 607-612.