

## Chapter 8

# PROGRESS OF PERIODONTAL RESEARCH AND PRACTICE IN INDIA

**Champaklal Pranalal Boghani**

Yenepoya Dental College and Hospital, Manglore, Karnataka, India

### Introduction

Today the horizons of periodontics have expanded tremendously as a result of accumulating research data. This work is full of uncertainties in the beginning, but as more and more experimental work is presented, confused ideas are cleared. A true research worker does not follow the path laid down by others but usually finds his own path and follows that path until the goal is achieved (Boghani, 1995). The highway of science is a broad straight thoroughfare but it cannot be traveled in a straight line because along the way it is littered with the wreckage of discarded scientific theories that were formerly believed to be the facts. In addition, incorrect conclusions have been made from well-planned and performed research studies. Since statistical analysis of clinical studies cannot always dictate the best treatment for our patients, good clinical judgement must often guide the periodontist towards better patients management.

Periodontal diseases have affected mankind since the earliest of times, and studies from ancient India and China have indicated that "Periodontitis", as evidenced by bone destruction, has been observed for many centuries. Research in the field of periodontics has defined the pattern of disease, methods of diagnosis, and modalities of periodontal treatment throughout the world.

Today, in India, the practice of periodontics has grown considerably. However, only a handful of qualified periodontists is available in this country. In this review, an attempt is made to analyse periodontal research and practice in India.

### India in Numbers

India is a vast country extending from Kashmir in the north to Kanyakumari in the south, and from coastal Saurashtra in the west to Nagaland in the hilly east. The population of India is about 955 million. The dentist population ratio is 1:5,000,000 with a literacy rate of 641:1,000 in males and 393:1,000 in females. Many of the people are living below the poverty line in urban (32.35%) as well as in rural areas

(37.27%). Hence, access of the people to oral hygiene aids (tooth brushes, tooth pastes and dental flosses) and prophylactic dental treatment is restricted.

India is divided into many states and each state is as big as many of the countries in Europe. In each state, a different language is spoken, a different religion is practised, and probably different oral hygiene habits are practised. People in India follow many systems in their daily living. Life styles in different areas are different. Their food habits are different. There is unity in diversity.

## **Dental Education in India**

After the establishment of the First Dental College in Calcutta in 1928 by Dr R. Ahmed, the father of modern dentistry in India, periodontics was established as a recognised method of treatment of the periodontal diseases. Dr Merchant and Dr Shourie in Mumbai, understood the importance of this specialty and started a separate section of Periodontology at the final BDS examination. Following the establishment of the Indian Society of Periodontology stalwarts like Dr Ginwalla, Dr T.N. Chawla and Dr G.B. Shankwalkar helped with the growth of Periodontology in India. The Bulletin of the Indian Society of Periodontology started its publication in 1975, and converted into the Journal in 1998. This Journal is now being published regularly.

According to the figures available from the Dental Council of India, there are about 140 dental colleges in India. Some of these colleges are recognised while others are in the process of recognition. Postgraduate education in dentistry was introduced in 1959 by Mumbai University and today about 35 dental institutions provide postgraduate training in Periodontics (Boghani, 1991). The remainder of the colleges are engaged in only undergraduate education. The maximum number of colleges are in the state of Karnataka and there are a few smaller states where there are no dental colleges.

The impact of the changing scenario over the last 30 years has been that postgraduate facilities have become less and less accessible, available and affordable to the increasing number of graduates who are qualifying out of the 140 institutions. Of more than 4,000 graduates who are passing every year, only 70 are able to get admission to postgraduate programs in periodontics.

## **Periodontal Education**

Education in Periodontics in India is at a cross-roads. Many newer techniques are available for treatment of periodontal diseases but treatment is expensive, and many people are not willing to undertake such treatment modalities.

Before 1960, the concepts of specialists were not developed in India. With the commencement of postgraduate education in India in 1959, Orthodontics achieved a status of specialty as it was something new concerned with aesthetics. Periodontics as a specialty received very little attention during 1960-70 probably because little was known about the pathogenesis and management of periodontal diseases. The scientific

advances made in the last two decades have constructively helped us to understand the disease and alter our treatment accordingly. Now the dental profession has recognised periodontics as a clinical specialty (Boghani, 1997).

## **Periodontal Practice - Concepts**

### ***Ayurvedic Concept***

Ayurved has been defined as the knowledge of life, and it commences from life itself and hence, is as old as the cosmos. Ayurved in other words is the description of the science of health. At present, a health care system exists in India where different types of diseases are being treated by ayurvedic method.

A view to the past indicates that in ancient times, India was probably the most advanced country in dental health services in the world. In the old Ayurvedic literature of India, details of gum diseases have been described and forms of treatment have also been described. The practice of oral hygiene was included in daily rituals (Choksy, 1960). Ancient scriptures such as Vedas, Puranas etc. proposed that the natural dentition could be preserved by appropriate periodontal treatment. Sushruta, the ancient Indian sage, had developed surgical instruments for scaling.

Today, Ayurvedic treatment is still very popular amongst rural and uneducated people in India. For the treatment of chronic periodontitis, massaging of the gums with oils and ointments prepared from herbs is still advised. It has been reported that some of the Ayurvedic preparations have various ingredients which have analgesics, anti-inflammatory properties as well as being able to facilitate cleansing and mouth freshening (D'Silva, 1999).

### ***Allopathic Concept***

At present, most periodontal treatment is based on the modern allopathic concept of defining etiology of the diseases, analysing signs and symptoms and executing treatment based on this. Presently, most of the research carried out in India is based on the allopathic concept with special emphasis on Indian Environment and Indian habits (Boghani, 1993).

Preventive periodontics has come to the forefront, as evidenced by heavy marketing of tooth pastes including Ayurvedic Homeopathic pastes, tooth powders, tooth brushes, flosses and other oral hygiene aids.

## **Periodontal Awareness**

In India, Oral Health Education is being constantly stressed by health educators. Public awareness of oral health is increasing due to the constant use of mass media advertising. Educating the public should also include correcting the misconceptions that scaling leads to the loosening of teeth and that extraction of upper teeth leads to loss of eyesight.

In India, dentistry is now well established as an important aspect of most public health programmes and new preventive measures are beginning to open prospects for successful reduction of dental diseases. This challenge arouses our interest not only in the science of public health, but in the art of providing a public health service.

### **Periodontal Research in India – Towards a Better Future**

There is urgent need for reorganisation of the periodontal research effort in India. Most of the research carried out in this country is by postgraduate students during their course of studies. This work is usually discontinued once the candidate passes the examination. Thus, all the research projects – be it epidemiological, preventive, experimental, clinical or non-clinical is all of a short-term nature. Not a single long-term study is available from this vast country. Most of the multinational companies present in India carry out periodontal research to propagate their innovative products, however, their results may sometimes be biased.

### **Research Facilities and Activities.**

Research facilities and activities are absolutely essential for the progress of the dental health care system in India. The progress of the profession is very much dependent on the research activities of postgraduate students. In India, more than 800 dissertations have been written during the last four decades on various aspects of Periodontology (see Table 1).

**Table 1.** Dissertation Topics from Indian Institutions.

	Nos		Nos
Basic Science	28	Oral Hygiene	47
Epidemiology	48	Treatment Modalities	95
Etiology	46	Systemic Factors	49

Many multinational companies have research facilities in India, but very little research work is published by them. Some Ayurvedic companies are also conducting research on their products and their works are regularly published. Availability of research facilities in periodontics is very limited. There is always a paucity of funds for research, hence clinical and basic research have been difficult to carry out.

Health Departments in most of the states in India give a low priority to dental research work and most of the available funds are allotted to diseases such as cancer, AIDS and viral diseases. Meagre funds are allotted to Dentistry, which is not properly utilised by the Department, since even research work which is duly carried out, rarely results in publications. The Indian Council of Medical Research offers financial assistance and co-ordinate dental research throughout the country.

## Research Topics

From the various dissertations submitted to Indian Universities, most seem to have been focussed on a research topic relevant to the Indian environment including topics such as etiological factors, risk factors, epidemiological factors and treatment modalities.

All the research projects are carried out at various dental institutions in India under the supervision of a qualified postgraduate faculty member. Fortunately most of the dental institutions have adequate library facilities with most modern text books and journals on Periodontology being available. Some of the libraries are equipped with Internet connections so that postgraduate students can access this evolving information source. At certain institutions, statisticians are also available.

### *Etiological Factors*

Recent experimental findings concerning the etiology and pathogenesis of periodontal diseases indicates that they are complex, multifactorial diseases caused by specific microorganisms characterised by an intense inflammatory response. Many studies carried out on plaque microbiology suggest that microbes of the supragingival plaque are aerobic in nature and those in the subgingival plaque are anaerobic in nature. Studies are also available to show a correlative effect between bacterial plaque and severity of periodontal diseases. All these studies are suggestive that bacterial plaque is closely related to gingivitis and periodontitis.

A great deal of research work is needed to gain better understanding of the multifactorial nature of periodontal diseases and actual mechanisms leading to destruction of attachment apparatus. Studies in the recent years are pointing towards host defence mechanisms and immunological aspects of host tissues (Pal, 1999; Veerandrakumar *et al.*, 1995).

### *Risk Factors*

Periodontal diseases result from an imbalance between pathogenic microbes and the nature and efficacy of the local and systemic host responses. Myriad risk factors contribute to this imbalance which modify the responses of the periodontal tissues (Table 2)

**Table 2.** List of Risk Factors

1. Specific Micro-organisms	7. Hormonal Dysfunction
2. Previous Destruction	8. Severe Nutritional Deficiency
3. Tobacco Consumption	9. Stress
4. Age	10. Immune Suppression
5. Genetic	11. Lack of Professional Maintenance
6. Uncontrolled Diabetes	12. Poor Inter Proximal Oral Hygiene

Of the listed Risk Factors, smoking appears to be of particular significance (Anto & Cherry, 1996). This may be of great importance in a country such as India where smoking is still very prevalent.

In India, there has been an explosion of interest and research in this area. Tobacco has been used in India in various formulations. For example, people habitually use tobacco for chewing (Gutka), smoking (Bidi) and smelling (snuff). Bidi delivers as much as 45 to 50 mg of tar as compared with 18 to 20 mg of tar from Indian cigarettes. It has been proven without any doubt that the habit of chewing of betel quid with tobacco, and placement of quid in the buccal fold of lower teeth, is mainly responsible for periodontal diseases (Anto & Cherry, 1996). The research work suggests that chewing of tobacco with betel leaf leads to the formation of plaque, calculus, stains on the teeth, and ultimately gingival recession. Increased consumption of tobacco leads to oral sub-mucous fibrosis. Oral sub-mucous fibrosis is believed to be a pre-cancerous lesion.

Over the past fifteen years, research in India has demonstrated a direct relationship between tobacco and periodontal diseases. This research has improved clinicians' understanding of how tobacco interacts with destruction of the periodontal structures. In India, it has been demonstrated that there is increased accumulation of plaque and calculus in pan and tobacco chewers and bidi smokers. One study has also shown that saliva of smokers has an increased flux and pH, which provides a suitable environment for calculus deposition. Smoking also has a deleterious effect on dental structures, plaque formation, calculus formation, chronic periodontitis, and delayed wound healing. It also effects the immune system. Nicotine and its major metabolite continue to be detected in saliva, gingival crevicular fluid and urine and can penetrate epithelium and exert effects on fibroblasts (Baiju & Nandakumar, 1998).

Amongst other risk factors, Diabetes Mellitus appears to be closely associated with chronic inflammatory periodontal diseases. Most of the research studies suggest that there is increased prevalence and severity of periodontal diseases in Diabetes Mellitus (Nilemas & Mehta, 1999).

In India, oral hygiene of the individual appears to be closely associated with severity of periodontal diseases (Boghani, 1963). Many studies carried out in India point out that dental factors like irregular alignment of teeth, unreplaced missing teeth, defective restorations and presence of root stumps are risk factors for the development of periodontal diseases.

### ***Epidemiology***

Periodontal disease is one of the most widespread diseases. There is no human being who is free from this disease. During the last twenty years, many scattered epidemiological studies have been carried out in India using various indices (see Table 3). However, the results have been varied and conclusions cannot be drawn. It is clear that recent epidemiological studies have provided more detailed description of the

periodontal conditions of the samples than did studies of earlier years. It must be realised, however, that the majority of studies have focussed on advanced forms of periodontal disease, hence comparisons made are not valid.

Many of the studies carried out in urban Indian populations indicate that 95-96% of people have some form of periodontal disease in the adult age group (Nandakumar, 1996). Studies carried out in rural populations show that about 100% of the people have evidence of periodontal disease. From these studies, it has been concluded that oral hygiene education is the most important aspect of dental treatment at the community level.

**Table 3.** Various Epidemiological Studies Conducted in India.

Sr. #	Author	Year	Place	Sample Size	Age Group	Gingivitis %	Periodontitis %
01	Marshall & Shourie	1947	Lahore	1054	09-17	99.40	-
02	F.S. Mehta & Sanjana	1953	Bombay	2219	18-55	100.00	-
03	J.C. Greene	1960	Bombay - Urban & Rural	1613	11-17	96.90	-
04	S.P. Ramjford	1961	Bombay - Urban - Rural	1161 159	11-17 19-30	100.00 100.00	2.20 42.40
05	O.P. Gupta	1962	Trivandrum	155 275 153 74 43 33 25	11-20 21-30 31-40 41-50 51-60 61-70 71-80	90.30 96.70 100.00 100.00 100.00 100.00 100.00	16.80 55.60 87.60 94.80 94.80 100.00
06	T.N. Chawla	1963	Lucknow	259 449 292	12-17 18-23 24-30	100.00 100.00 100.00	72.20 80.00 91.10
07	M.K. Basu & Dutta	1963	Calcutta	M 242 144 173 F 237 98 97	12-17 18-23 24-30 12-17 18-23 24-30	100.00 100.00 100.00 92.70 98.30 99.60	22.31 74.51 91.32 34.60 40.82 93.81

Sr. #	Author	Year	Place	Sample Size	Age Group	Gingivitis %	Periodontitis %
08	D.C.Miglani & Sharma	1965	Govt General Hospital Madras	M 103	15-20	81.55	63.11
				153	21-25	88.89	86.27
				99	26-30	94.95	86.90
				F 41	15-20	85.37	71.17
				36	21-25	88.89	83.33
				26	26-30	92.32	88.46
09	M.K. Basu & Dutta	1965	Calcutta	776	12-17	93.70	18.60
				947	18-23	98.70	45.00
				1396	24-30	99.60	64.40
10	Roy B.C.	1965	Kirke, Poona Industrial Workers	659	19-55	100.00	44
				2040	19-55	100.00	64
				1200	19-55	100.00	
11	S.L. Mangi	1966	Rural Madhya Pradesh	M 358	16-20	98.90	11.45
				317	21-25	99.40	37.85
				315	26-30	100.00	50.79
				212	31-35	100.00	70.75
				220	36-40	100.00	78.63
				154	41-45	100.00	92.20
				117	46-50	100.00	92.30
				67	51-55	100.00	88.90
				F 178	16-20	98.90	18.65
				154	21-25	87.80	39.13
				185	26-30	100.00	64.54
				110	31-35	100.00	82.50
				120	36-40	100.00	90.55
				74	41-45	100.00	83.40
				91	46-50	100.00	89.47
				19	51-58	100.00	100.00
37	>56	100.00	12.00				
12	Boghani	1971	Gujarat	9837	15-65	68.00	38.60
13	Ramachandran	1974	Madras - Rural - Urban	6547			95.30
				1536			95.50
14	Thaha	1986	Trivandrum - Urban & Rural	6500		92.00	88.60

Sr. #	Author	Year	Place	Age Group	CPI Scores in %				
					0	1	2	3	4
01	Desai	1986	Gujarat		0.00	0.00	12.00	67.00	21.00
02	Shenoy	1989	Bangalore	15-64	96.00	37.00	35.00	23.00	27.00
03	Srinivas	1989	Andra		2.00	2.00	37.00	40.00	19.00
04	Anil	1990	Trivandrum	15-19	3.00	18.00	68.00	9.00	2.00
				35-44	1.00	8.00	14.00	44.00	33.00
05	Sunitha	1993	Varanasi	35-44	4.10	4.70	4.10	8.10	2.90
				65-74	8.50	3.70	16.00	7.30	13.00
06	Maity	1994	West Bengal	15-19	4.30	24.00	72.00	0.30	0.00
				35-44	0.70	0.80	78.00	21.00	0.30
				65-74	0.00	0.00	69.00	28.00	2.90
07	Maity	1995	West Bengal	15-19	4.30	24.00	72.00	0.30	0.00
				35-44	0.70	0.80	98.00	2.10	0.30
				65-74	0.00	0.00	69.00	28.00	2.90
08	Rao	1995	Varanasi	15-44	16.00	43.00	38.00	1.60	0.20
09	Joseph & Cheru	1996	Trivandrum	15-64	8.50	15.00	48.00	17.00	12.00
10	Kurien	1996	Karnataka	15-19	0.00	5.30	87.00	6.10	1.50
				35-44	0.00	0.00	25.00	40.00	35.00
				65-74	0.00	0.00	9.80	12.00	78.00
11	Shah	1997	Ahmedabad	15-19	4.40	24.00	72.00	0.20	0.00
				35-44	53.00	12.00	72.00	18.00	8.20
12	Maity	1998	West Bengal	30-44	41.00	0.80	77.00	20.00	0.30
				45-64	0.00	2.00	71.00	27.00	24.00
				>65	0.00	0.00	68.00	28.00	3.30

India is a very big country, hence the validity of the research obtained from epidemiological studies conducted at different parts is questionable, and not comparable. Under the circumstances, the Indian Society of Periodontology is conducting a nationwide survey based on Community Periodontal Index, which is approved by the World Health Organisation (WHO). This will probably provide detailed information of prevalence of periodontal diseases in India, in the near future.

### **Preventive Periodontics – Brushes**

Because periodontal disease is a plaque related disease, research in India is concentrated on mechanical plaque removal and chemical plaque removal. Mechanically, plaque can be eliminated by tooth brushes, miswak sticks, fingers, and inter-proximal cleansers. Over the years, the Indian system of medicine has given great importance to oral hygiene as an essential part of the general health. Indeed, people of the Hindu faith consider that the mouth is the gateway to the body and therefore must be kept clean at all times.

In India, many people do not use tooth brushes but they use miswak sticks or fingers to clean their teeth. However, in urban and semi-urban areas, tooth brushes are slowly replacing traditional methods. For economic reasons, age old religious beliefs and traditional values are still practised as methods of oral hygiene by some people living in rural areas.

Miswak or chewing sticks, which involve the practice of chewing the end of a stick obtained from various plants, is commonly used in some areas of India (Boghani, 1971). Recently, the World Health Organization (WHO) has recommended and encouraged the use of these sticks as an effective tool for oral hygiene. There are studies investigating the chemical contents of the extracts of miswak. Tannins and resins have an astringent effect on mucous membranes. Alkaloids and sulfur tend to aid its antibacterial effect. Chloride contents help to remove plaque and tartar stains. Vitamin C contributed to the healing and the repair of the tissues. In India, chewing sticks are obtained from the plant *Salvadora-persica*. In clinical trials in India, chewing sticks are found to be effective in removing plaque from the facial surfaces of teeth while they are ineffective on lingual and palatal surfaces of teeth (Boghani, 1991). Few clinical trails have shown that plaque removing efficacy of manual tooth brushing is superior to miswak. Thus, the use of chewing sticks and herbs is quite prevalent amongst rural populations in India, as a tool for cleaning the teeth.

The maintenance of interproximal gingival health is an integral part of preventive periodontics. As such, attention is being drawn to inter-dental area. In India, it has been observed that the proxa brush is better as an interproximal cleaning aid than dental floss, tooth picks or other interproximal cleansing aids.

It has been found that people who habitually used indigenous methods for cleaning their teeth are difficult to be motivated to change their habits and use brush and paste.

Attempts have been made to teach the villagers to use mango leaves systemically to reach all the surfaces of teeth. From these efforts, Kini (1997) concluded that by modifying oral hygiene habits, with the use of mango leaves, people can be brought to an acceptable level of plaque control.

### **Preventive Periodontics – Used Brushes**

Today the market is flooded with various brand names of tooth brushes and tooth pastes, each claiming superiority over others. Most of the studies on tooth brushes are dependent on the skills, perseverance and motivation of the individual. The designs of tooth brushes and characteristics of the brushes are variable, and many studies concerning tooth brush design and efficacy are available (Rao *et al.*, 1999).

Efficacy of these tooth brushes has been studied. It seems that all the brushes have similar plaque removing abilities on the facial and lingual surfaces of the teeth, but in the interproximal areas their effect is restricted.

In India, few studies are available on wear patterns of tooth brushes (Uproor *et al.*, 1998; Ashu, 1991). Very few people change their tooth brushes regularly, hence it would be interesting to study the wear pattern. The average life of tooth brushes manufactured in India is fourteen weeks, but it seems people use the same tooth brush for more than one year. It has also been observed that worn tooth brushes do not cleanse as effectively as new tooth brushes (Jathat, 1999).

### **Preventive Periodontics – Dentifrices**

In the developing countries, tooth paste is unknown to many people. They use home made devices to clean their teeth. However, over the past two decades, use of dentifrices has increased amongst the people in India. It appears practical to add active substances with known effects to tooth pastes since no extra effort is required to the user.

Traditionally in India, tooth paste has been used to remove stains and to provide a fresh taste in the mouth. At present, research studies have mainly concentrated on anti-plaque tooth pastes and anti-calculus tooth pastes. Research is also being carried out on herbal tooth pastes. It seems that there is a trend towards returning to more “natural” products. Research comparing herbal based tooth pastes with conventional dentifrice suggest that there is no specific advantage of herbal based pastes over conventional pastes (D'Silva, 1999; Seshan *et al.*, 1999; Mythilli, 1997).

### **Preventive Periodontics – Commercial Tooth Pastes**

In India, tobacco based tooth pastes are freely available and they are very popular amongst the rural and illiterate urban people. Research suggests that such tooth paste should be banned. The Consumer Education and Research Centre has warned against the use of such tooth pastes as they are serious health hazards. The research work

carried out by WHO has concluded that tobacco tooth pastes contain  $7.6 \pm 0.5$  mg of nicotine per gm of tooth paste, which according to WHO, is a high rate in terms of health hazard. These pastes are also habit forming. In one survey, women were found to be more addictive to tobacco paste than males (Boghani 1971). The Indian Government has wanted to ban the advertisement of such pastes but the manufacturers of such tobacco-paste, are powerful, and hence such a ban has not been effective.

### **Preventive Periodontics – Indigenous Methods**

Besides tooth pastes, tooth powders are commonly used in India. These powders are used with tooth brushes, miswak sticks or with fingers. In the early days, the powders were abrasive and the main ingredients of these powders were coal, ash or tobacco.

Some of the Ayurvedic tooth powders contain ingredients claimed to increase the tone of gums and reduce gingival inflammation. These products are available either in powder form or in easily crushable tablets to be used as a dentifrice. In a double blind study in an orthodontic patient, it was found that one such powder was useful in the reduction of inflammation after orthodontic movement of teeth following long term use (S.C. Savadi 1972). More than twenty eight papers have been published on Ayurvedic tooth powder in various Indian publications.

### **Indigenous Tooth Cleansing Methods**

A wide variety of aids are used for tooth cleaning in India. A range of these is listed in Table 4. Research on these indigenous methods suggest that the prevalence and severity of periodontal disease is increased when charcoal and ash is used for oral hygiene purposes (Gupta, 1962).

Anti-microbial properties of betel leaf extracts have been extensively studied in patients. It was concluded that the percentage distribution of bacteria elucidated from habitual betel leaf chewers did not significantly differ from those who do not have such habits. However, the number of micro-organisms per field area is less in betel leaf chewers .

Studies on mango leaves, cashew leaves and coconut husk have suggested that these have an anti-plaque and anti-inflammatory activity. The use of these leaves has been found to be beneficial to prevent periodontal diseases in studies in the villages in Kerela and Karnataka.

Few research studies are available on anti-plaque mouth rinses in India. However, several reviews have been published on anti-plaque agents (Mihir Shah, 1997) and their method of delivery. All of these anti-plaque agents have some anti-microbial activity but all anti-microbial agents are not necessarily anti-plaque agents.

Most recent studies relate to the use of chlorhexidine. From the research work, it has been observed that chlorhexidine is quite useful as an antiseptic agent for supragingival plaque but it has limited effect on subgingival plaque flora. It has very limited access to interproximal areas.

Studies on Triclosan and Zinc-citrate unequivocally show a benefit in maintenance of gingival health and prevention of early gingival disease (Shah, 1993). In the future, it might be expected that more selective agents, affecting only the plaque pathogens and offering anti-plaque benefits may result from growing insight into plaque metabolism and ecology.

**Table 4.** Indigenous Oral Hygiene Methods in India\*

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(A) **Plants and Their Parts**

- |  |  |  |
|--|--|--|
| 1. Leaves:                                     |  |  |
| &hat; Mango ( <i>Mangifera Indica</i> )        |  | &hat; <i>Ixora Coccinea L</i>          |
| &hat; Cashew ( <i>Anacardium Occidentale</i> ) |  |  |
| 2. Twigs and Stems:                            |  |  |
| &hat; Babul ( <i>Acacia Arabica</i> )          |  | &hat; <i>Ixora Coccinea L</i>          |
| &hat; Neem ( <i>Azadirachta Indica</i> )       |  | &hat; <i>Eugenia Corymbosa</i>         |
| &hat; <i>Jatropha Carcas L</i>                 |  | &hat; <i>Banyan(Ficus Bengalensis)</i> |
| 3. Fruits:                                     |  |  |
| &hat; Coconut and its parts                    |  |  |
| 4. Barks:                                      |  |  |
| &hat; Walnut ( <i>Juglans Regia</i> )          |  |  |
- 

(B) **Charcoal and Modifications**

1. Charcoal peices ground on stones
  2. Charred paddy husk - Carbon from paddy husk (Activited Carbon)
  3. Burnt charcoal shell powder
  4. Carbon collected on vessels used for boiling water
  5. Burnt tobacco and snuff
  6. Modification of above mentioned materials with the addition of salt, pepper powder etc.
- 

(C) **Miscellaneous**

- |                   |                    |
|-------------------|--------------------|
| &hat; Sand        | &hat; Brick Powder |
| &hat; Ash         | &hat; Coal Powder  |
| &hat; Common Salt |                    |
- 

\* Adopted from Bhatt & Gore, 1999

## **Therapeutic Modalities – Methods**

Periodontal diseases are complex having multifactorial etiological factors and involve loss of attachment around the teeth, resulting from the actions of micro-organisms, and the response of the host tissues to these organisms. Conventional modes of treatment are listed in Table 5. During the 20<sup>th</sup> Century, society has experienced more changes in the pharmacological management of disease than any other time in the history. The most effective treatment of different types of periodontitis currently requires mechanical root preparation in the presence or absence of surgical revision of the periodontium. However, such treatment can be time consuming, expensive and uncomfortable for the patient. Therefore, other modes of treatment have been investigated. These have included drug therapy. In India, this has mainly been directed at preventing periodontal tissue destruction and preventing alveolar bone destruction. It has been recognised that drugs should be potent, site specific, effective, and safe.

**Table 5.** Therapeutic Modalities – Objectives

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1.	Elimination of Periodontal Pockets
2.	Elimination of Gingival Inflammation
3.	Cessation of Bone Destruction
4.	Re-establishment of Gingival Architecture
5.	Regeneration of Periodontal Tissues:
	â Cementum
	â Alveolar Bone
	â Periodontal Ligament

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## **Anti-Microbial Therapy**

It has been established that control of the bacterial flora within the gingival crevice is a significant factor for treatment of periodontal disease. Consequently, during the last decade, antibiotic therapy has been a key measure for effective periodontal treatment

Administration of systemic antibiotics has several problems associated with their use in the treatment of periodontal diseases. In particular, repeated large doses of antibiotics will produce resistance to micro-organisms, and side effects of drug reaction. Therefore, local delivery systems for periodontal antibiotic treatment has been developed. Local drug delivery system should reach the site in question, kill the micro-organisms, maintain an inhibitory concentration, remain at the site long enough to be effective and should be bio-compatible.

Three approaches to antimicrobial therapy have been studied. These have included:

Systemic Administration, Topical Application and Controlled Release Devices.

1. Systemic Administration: Clinical trials carried out in India have concluded that although Ledermycin was the drug of choice in earlier days, it has now been replaced by Metranidazole, Amoxilillin combination and by Metranidazole Ciprofloxacin combination. These clinical trials were based on experimental evidence available in Western literature (Mythilli, 1994).
2. Topical Administration: Various mouth rinses containing phenolic compounds, quaternary ammonium compounds and herbals have been tried with limited success. Ointments containing Metranidazole have been used in the treatment of ANUG and also in chronic gingivitis. Whether sub-gingival flora is influenced by gels containing Chlorhexidine is questionable. Indian studies are not conclusive and, it is felt that such studies are mainly carried out for the interest of the manufacturer (Boghani 1997).
3. Controlled Release Devices: Controlled release devices refers to delivery of active antibiotics to a specified target site at a rate and duration designed to accomplish a desired effect. The evaluation of local anti-microbial therapy carried out over the years seems to have lead to a treatment philosophy that places an emphasis on achieving optimal efficacy with minimum dose, and drug use. For example, one study conducted on Tetracycline and Metranidazole using an ethyl cellulose strip concluded that Metranidazole is more efficient when used locally in the pocket (Somaiji, 1993). Furthermore, a local drug delivery system using Ciprofloxacin has shown promising results suggesting that effective drug concentration remains in periodontal products for more than 90 days (Rajesh, 1993). The combination of two antibiotics in local areas (e.g. Ciprofloxacin and Tinidadole) offers even better antibacterial activity than individual antibiotics (Thomas, 1999). This combination reduces depth of the pocket and helps in controlling periodontal disease for about 90 days.

Many methods of prolonging drug action have been investigated. We have investigated complexing drugs with betacyclodestrine to increase stability and prolong drug activity. Using this system and antibiotic concentration above MIC has been achieved up to 90 days. Control sites did not show any effect of antibiotic, suggesting that the drug was targetting specific sites only.

## **Regenerative Therapy**

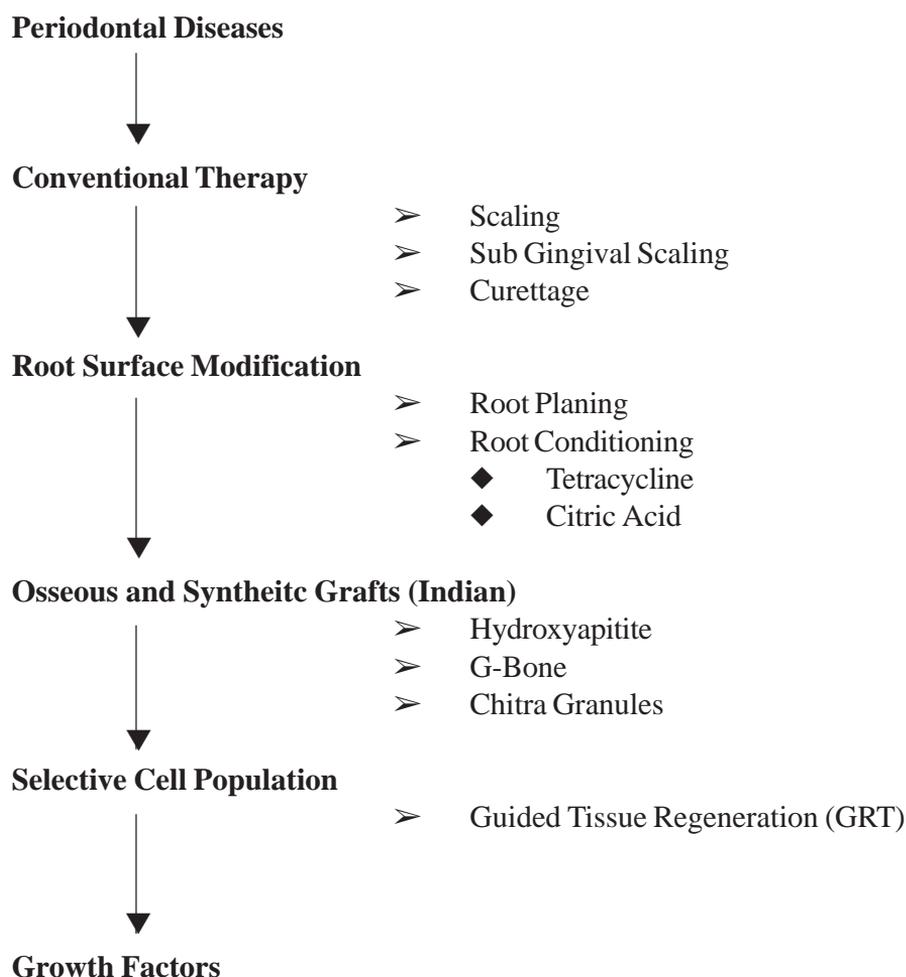
Although complete periodontal regeneration is unpredictable, periodontal bone grafts have been popular because it is claimed that they lead to better bone fill, promote osseointegration, and may regenerate bone, cementum and periodontal ligament.

In India, bone graft materials are imported from other countries such as the USA, Germany and Japan which makes regenerative therapy expensive. Local sources of

bone grafting material are being investigated and good results are observed.

Animal and human studies carried out using Sri Chitra Granules have produced good results in three walled infrabony pocket. Similar clinical trials have been carried out with other indigenously produced grafting materials such as G-Bone and H-Bone. In one study carried out in rabbits, bone formation associated with Sri Chitra Granules and Osteogen were identical. Subsequently, a clinical trial was conducted and it was found that the results obtained by Sri Chitra Granules and Osteogen were identical or similar. Now that all of the preliminary tests have been carried out, this product will be marketed soon in India (Phillips, 1999). Locally produced GTR materials like collagen membranes are also being developed (Table 6).

**Table 6.** Regenerative Therapy



## **Traditional Periodontal Therapy**

As mentioned earlier, the Ayurvedic concept in the treatment of periodontal diseases is still available to Indian people. In the Western world, it is difficult to accept modalities of Ayurvedic treatment, however, a few studies do advocate this form of non-surgical treatment of chronic Periodontitis (Seshan *et al.*, 1999).

Medicated powders have been studied which claim that, when massaged on the gums, will strengthen the gums and freshen breath. It is claimed that such gum massage increases local blood supply, strengthens the gums, and reduces inflammatory swellings. More than ten research studies have been published in recognised journals in India reporting the utility of such gum massage (Godhani& Surat, 1993).

However, it should be noted that tall claims have been made regarding these Ayurvedic preparations without much scientific data to indicate their usefulness as major remedial agents for the treatment of periodontitis (Mythilli, 1997).

Recent clinical trials carried out on such powders (Seshan, 1999) have indicated such powders are more effective if used after scaling and root plant rather than before oral prophylaxis. Similar studies of neem gel (D'Silva & Magar, 1999) also recommend use after oral prophylaxis. Long term studies are not available for comment.

It is interesting to note that surgical periodontal therapy cannot be avoided by the use of such powder, in other words, periodontal pockets cannot be eliminated by use of such powders.

## **Periodontal Practice in India**

The practice of periodontics in India requires complete reorganisation. At present, people of rural India do not have access to periodontists for their periodontal treatment. In order to provide treatment to those under privileged people, some planning will have to be done. People have to be motivated for oral hygiene and they should be adjusted for treatment at reasonable rates.

Oral hygiene habits of Indian people is varied. In different areas, brushes are being used but not replaced. In future, we shall have to instil oral health measures so that they will be able to sustain and retain their natural dentition.

## **Types of Periodontal Practice in India**

### ***Institutional Practice***

In India, many dental colleges have full-time faculty staff who practice exclusive periodontics after office hours in private practices usually located in the city. In the institutions, there are departments of periodontics, and the staff attached to these departments, along with postgraduate students, treat needy periodontal patients either

without any charges or with a minimum amount of fees to be paid.

### ***Specialist Practice***

More than sixty periodontists are being qualified every year from various institutions in India. Some of these individuals prefer to join academic career and try to join a Dental College of their choice. Many new colleges are being established throughout the country, hence opportunities are always there to get teaching assignments in periodontics. Others prefer to open private dental clinics and restrict their practice to periodontics.

At no time in the history of the dental profession has there been such an intense demand for periodontal care as there is today. Periodontists alone cannot meet these demands, hence general dental practitioners must help patients carry out preliminary dental treatment

### **Practice by General Dental Practitioners**

General dental practitioners (GDPs) have to make judicious use of knowledge and skills in the field of Periodontology, to help patients manage periodontal health. If general dental practitioners can handle simple periodontal patients, specialists can help to treat advanced and complicated periodontal patients. However, in India, most of the GDPs extract the periodontally involved tooth rather than referring the patient to a periodontist.

More periodontists should communicate with the general dentists and show them how easy and rewarding good dentistry can be when a strong team approach between the periodontists and GDPs is achieved. General dentists and periodontists should understand each others expectations, limitations, abilities and commitments. Dentistry then becomes more satisfying, more profitable and of higher quality and less stressful (Boghani, 1993). It is difficult to envision any successful dental practitioner who does not render some form of periodontal treatment. Most of the dental surgeons offer many periodontal services to their patients including prophylaxis, non-surgical techniques of pocket eradication, regular maintenance and regular follow-up.

Since the number of periodontists in India is limited, there is an urgent need to improve the expertise of general practitioners so that they may successfully treat initial cases of periodontal disease (Trevadi, 1997). GDPs should also be able to recognise the more difficult cases and be willing to consult with a specialist.

### **Interdisciplinary Approach in Periodontics**

Dentistry exists as a profession to help save and restore the natural dentition. In earlier days in India, dentists were meant for extracting the teeth and replacing the same with "Acrylic Dentures". However, since nature intended teeth to last for a life

time, there are few people who cannot realise this dream without the help from modern dentists.

Periodontal practice should be based on a multi-disciplinary approach to treat the patient suffering from periodontal diseases. Very few periodontists consult their colleagues of other disciplines to provide the treatment alternatives to our patients.

It seems that for successful treatment of any periodontal patient, the execution of a well organised and conceived treatment plan must be followed to restore proper form and function to the system. Thus, the periodontist plays a vital role in laying a healthy foundation for further definitive, comprehensive and restorative treatment.

### **Urban Practice**

Most of the dental institutions are established in urban areas hence routine periodontal practice is organised in metropolitan cities of India. Practising periodontists too prefer to settle down in urban areas as the financial gains are in such lucrative areas.

### **Semi-urban Areas**

In India, the practice of periodontics in semi-urban areas is limited. General dental surgeons restrict periodontal treatment to “scaling” and “oral prophylaxis” only. Some periodontists do visit district places periodically to carry out surgical procedures in such areas. Regular services of periodontists are not available in such areas.

### **Rural Areas**

In India, periodontal practice in rural areas is non-existent (Boghani, 1992). People living in these areas are not aware of periodontal treatment. Government hospitals provide dental services to the ailing patients but those services are only for emergency dental treatments such as extractions.

## **Problems Facing Periodontal Practice in India**

### ***Treatment by Ayurvedic Practitioners***

Most of the Ayurvedic practitioners treat periodontal problems by advising the patients to avoid surgical treatment advised by periodontists and follow conventional therapies such as; application of powder over the affected gum, massaging the gums with herbs and roots, and using mouth rinses containing ayurvedic herbs.

### ***Patient Perceptions***

Most of Indians believe in conservative treatment of periodontal disease, without submitting themselves for periodontal surgery. This is more so in rural environments. People at large have a fear of surgical treatment.

At the same time, people believe that once periodontal disease starts, there is no treatment and all the teeth must be extracted. Awareness is lacking, hence they feel the teeth should be extracted rather than initiating periodontal treatment. Financial constraints are always there and periodontal treatment has the lowest priority, and hence exclusive periodontal treatment is not possible in India.

## **Principal Methods of Periodontal Practice in India**

### ***Regular***

It is unfortunate to observe that in a country like India, regular dental maintenance is non-existent. Wherever there is tooth-ache or bleeding from gums, people visit dental surgeons and get the tooth attended to, once the problem is solved, complete dental treatment is advised but patients avoid this treatment due to expense, the time-consuming nature of the treatment and age-old beliefs.

In India, beliefs related to periodontal treatment are worth recording. These include:

- a) By “scaling”, teeth become mobile and subsequently they are extracted
- b) Periodontal diseases cannot be treated and all the teeth must be removed.
- c) As the age advances, teeth become mobile and hence they should be extracted.
- d) Regular prophylaxis weakens the enamel.

### **Recall Visits**

Non-compliance leads to patients avoiding recall visits. Reasons for non-compliance include: lack of pertinent information, fear, economics and lack of compassion on the part of periodontists.

### **Re-treatment**

Periodontal treatment involves a continuous treatment regimen. Once the surgical procedures are completed, many patients believe that further treatment is not required, however, this is not so. Patients are not motivated for regular oral prophylaxis or regular dental check-ups. Practice of periodontists suffers due to improper motivation, and non-cooperation by the patients. In India, the number of periodontists practising periodontics are very few and most of the periodontists have diverted their practice to other disciplines of dentistry which offer far better income than in periodontics. Hence, practice in periodontics is still in its infancy and it is likely to take many years to upgrade periodontal practice in this vast country.

### **Referrals**

In exclusive periodontal practice, referrals are very important. But in India, barely 1% of the patients are referred to periodontists by general dental practitioners or by

medical practitioners. General dental practitioners do not refer their patients to specialists as they fear that the patient will be lost after periodontal treatment is carried out by a periodontist. They also feel that, even if the pocket is eliminated, it is likely to recur after some time. General dental practitioners are not aware of periodontics as a specialty, hence they may refer their patient to another general dental practitioner rather than to a periodontist.

## **Periodontal Research and Practice in India – In the New Millennium**

In India, population growth is tremendous and it requires to be controlled if we wish to provide good health and hygiene to our people. To provide the good services required, we need manpower and equipment. We cannot change the mental attitude and approach of our people. It is difficult to change oral hygiene habits in a day but constant efforts by professional people will improve the preventive approach.

### **Priorities in treatment**

From the various surveys carried out, it is felt that AIDS will be the most prevalent disease in this country, and as we see today, AIDS does not show prominence in treatment. One will have to give priorities to the diseases like AIDS, Cancer and Tuberculosis as these diseases are killer diseases. Not surprisingly, periodontal diseases have a low priority, hence economic aid is essential if we want to begin to make progress in managing and preventing disease.

### **Conclusion**

Seeing all the possible scenarios, let's hope that the next millennium enables to not only prevent disease progression, but also identify high-risk patients and target treatment to specific sites. No doubt, new tests hold considerable promise and clinicians are on the threshold of treating patients with greatly improved sophistication and accuracy. However, periodontal disease is site-specific and episodic. So, which site to sample and when, demands excellent clinical judgement and may pose a problem.

### **References**

- Anto, Cherry. Effect of smoking on periodontium. *Bulletin Indian Soc Periodontol* 1996;20:61.
- Ashu. Age of different texture of tooth brushes. *Bulletin Indian Soc Periodontol* 1991;15:14.
- Baiju, Nandakumar. Smoking and periodontal diseases. *Bulletin Indian Soc Periodontol* 1998;1:12.
- Bhatt. Dissertation submitted by Philladi to Mangalore University, 1999.
- Boghani CP. Editorial. *Bulletin Indian Soc Periodontol* 1995;19:45.
- Boghani CP. Periodontal Education: *Bulletin Indian Soc Periodontol* 1991;15:1.
- Boghani CP. Making a successful periodontist. *Bulletin Indian Soc Periodontol* 1993;221:1.

- Boghani CP. Editorial. *Bulletin Indian Soc Periodontol* 1996;2:33.
- Boghani, Shankwalkar. Exfoliative cytology study in panchewers and bidi smokers. *J Indian Soc Periodontol* 1963;1:23.
- Boghani CP. Dessertation submitted to University of Dundee, Scotland., 1971.
- Boghani CP. Relationship between miswak and periodontal diseases. *Bulletin Indian Soc Periodontol* 1991;15:11.
- Boghani CP. Can we afford periodontal treatment? 1992;16:1.
- Boghani CP. Practising periodontists. *Bulletin Indian Soc Periodontol* 1993;17:1.
- Choksey. Dentistry in Ancient India, Page 26.
- D'Silva. The effect of neem gel on plaque and gingivitis. *J Indian Soc of Periodontol* 1999;2:63.
- Gupta. Dessertation submitted to University of Dundee, 1962.
- Jathat. Wear pattern in tooth brushes. *J Indian Soc Periodontol* 1999;1:27.
- Kini. Dessertatiion submitted to University of Mahe, 1997.
- Maity. Periodontal health status of rural populatiion in West Bengal. *J Indian Soc Periodontol* 1998;1:23.
- Mythilli. Efficacy of herbal based tooth pastes and conventional dentidrices on the control of plaque and gingivitis. *Bulletin Indian Soc Periodontol* 1997;21:86.
- Mythilli. Antibiotics therapy in periodontitis: The evaluation of controlled release devices. *Bulletin Indian Soc Periodontol* 1994;18:4.
- Nandakumar. Assessment of periodontal treatment needs in patients attending dental college and hospital trivandrum. *Bulletin Indian Soc Periodontol* 1996;10:67.
- Nilemas, Mehta. Diabetes mellitus; systemic modifier in periodontal disease. *J Indian Soc Periodontol* 1999;2:48.
- Pal. Studies on immuno-potential of bioceramic of perio: An immunological essay. *J Indian Soc Periodontol* 1999;2:69.
- Philippis. Desserrtation submitted to Rajiv Gandhi University. Evaluation of chitra granules in periodontal regeneration. *Bulletin Indian Soc Periodontol* 1999
- Rao. Comparative evaluation of plaque removing efficacy of two newly designed tooth brushes. *J Indian Soc Periodontol* 1999;1:73.
- Reddy M. Prevalence of periodontitis in Mangalore (India). *J Indian Soc Periodontol* 1998;1:83.
- Uproor. A comparative evaluatiion of wear of tooth brushes with four different textures and their ability to maintain oral hygiene. *J Indian Soc Periodontol* 1998;1:51.
- Seshan. Comparative study of the efficacy of different inter-proximal aids. *Bulletin Indian Soc Periodontol* 1991;15:23.
- Seshan. Efficacy of herno mineral product in the control of bleeding and spongy gums as an astringent, anti-inflammatory and dentrifice. *J Indian Soc Periodontol* 1999;2:66.
- Shah. Dessertation submitted to Gujarat University, 1997.
- Veerandrakumar. Role of silicon in calculus formation. *Bulletin Indian Soc Periodontol* 1995;19:64.
- Thomas. Dessertation submitted to Rajiv Gandhi Univeraity, 1999.
- Trevadi. Periodontal health in interdisciplinary dentistry. Philipps. *Bulletin Indian Soc Periodontol* 1997;21:21.