Periodontal Disease in Developing Nations

A debilitating dental problem which affects millions should be included in public health programs abroad.

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Recent surveys conducted by the U.S. Interdepartmental Committee on Nutrition for National Defense have demonstrated rather conclusively that one of the most neglected health problems facing the people of Asian and African countries studied is periodontal disease.

This disease is a complex inflammation of the supporting tissues of the teeth which usually first manifests itself in the marginal gingival areas of the dental arch. Eventually the underlying alveolar bone around the roots of the teeth is destroyed and the teeth involved must be removed to relieve the patient's suffering.

When a disease of any kind affects the health, comfort and personal dignity of eight out of ten adults in the prime of life, as it does in Vietnam, for example (*1*), it presents the nation concerned with a problem of such proportions, that our failure to provide some sort of assistance is difficult to understand. The fact remains, however, that in most instances, dental health is completely ignored even in those countries where public health programs are under way.

The purpose of this paper is to shed more light on the problem of periodontal disease in the less-developed areas of the world and, more important, to propose a program for prevention and treatment that would rapidly effect a large measure of control where today none exists. This plan need not be costly, especially when compared with expenditures for other programs that do not have the same widespread potential impact at the grass-roots level that a dental health program would have.

Surveys by the U.S. Interdepartmental Committee on Nutrition for National Defense (ICNND) have demonstrated rather convincingly that tooth decay is a surprisingly insignificant factor in the underdeveloped nations. For example, in Ethiopia, 77 percent of the people examined were totally free of caries and those under 40 years of age averaged less than one DMF (decayed, missing, or filled) tooth per person (*2*). In Vietnam, the ICNND team discovered only a slightly higher incidence of decay than in Ethiopia (*2*) and concluded that the need for treatment of caries in this area of the world is very small at present (*1*). Again, in Thailand, ICNND found tooth decay practically nonexistent, with an average of 0.13 decayed, missing, or filled tooth for the 0- to 9-year age group; 0.71 for the 10- to 19-year age group; and 0.84 for the 20- to 29-year age group (*3*).

The same surveys, however, revealed a shockingly high incidence of periodontal disease in these countries. In Ethiopia, periodontal disease was found to be widespread and severe after age 30 (*2*). In Vietnam, 30 percent of the people were found to have the disease in advanced stages by the age of 25 to 29, and 84 percent were so afflicted at age 50 or over (*1*). Only 9 percent of the people examined in Vietnam over the age of 10 were free of the disease; field workers from the U.S. National Institute of Dental Research commented that they had never observed such a high incidence of periodontal disease as in this country (*1*). In Thailand, where tooth decay is practically nonexistent, the surveys showed that, by the age of 44, 75 percent of the people are afflicted with severe irreparable damage due to periodontal disease (*3*).

Similarly, studies in India (*4*) have revealed that over 80 percent of the children in certain areas suffer from periodontal disease severe enough to involve alveolar bone loss in many of the 12-to-16-year-olds studied and in almost all of those over the age of 16 (*4*). The Chief Minister of Mysore, S. B. D. Jatti, said in 1959 (*5*):

> It was discovered that the high prevalence of periodontal disease in children is almost 80%. This shows the magnitude of the problem we have to face. The children who form the life-blood of the country cannot on any account be neglected . . . Even when they grow to manhood they suffer from periodontal disease and its attendant complications. They lose teeth and get old prematurely. The longevity of life is shortened and their working capacity too is lessened! ! We must have real teeth up to ripe old age.

A. L. Russell, chief of the Epidemiology and Biometry Branch of the National Institute of Dental Research, and recently chairman of the World Health Organization's Expert Committee on Dental Health, which reported on periodontal disease, stated in an interview that local factors, primarily calculus (a hard irritating deposit of the saliva which forms on the teeth) and poor oral hygiene, are the "overwhelming" causative factors observed by the ICNND survey teams (*6*). Proof of this contention was demonstrated in Ethiopia, where the ICNND group reported that the extent of the calculus deposits was directly related to the condition of the periodontal tissues, abundant deposits of calculus and food debris having been observed in virtually all mouths examined (*2*). There was much less evidence of periodontal disease in groups of patients with small amounts of calculus or debris, whereas it was present in more advanced stages in groups with heavy calculus and debris (*7*). In Vietnam, heavy deposits of calculus were present in the mouths of nearly every person aged 12 or older (*2*).

Furthermore, of Vietnamese soldiers who had the benefit of regular prophylaxis and who had been taught the techniques and benefits of good oral hygiene, only 20 percent suffered from periodontal disease, whereas their civilian counterparts had a 41-percent disease rate (*1*). Again, in Thailand, ICNND found a significant difference in the disease rate of military and civilian males. At an average age of

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33, only 20 percent of the military as opposed to 50 percent of the civilians were afflicted with periodontal disease (*3*). These significant findings provide strong support for the effectiveness of simple calculus removal and improved oral hygiene in the treatment and control of periodontal disease in an affected population.

In view of the critical shortage of dentists in these countries, the problem seems at first glance to defy solution. In Afghanistan, for example, there are only 57 dentists in a population of 13 million people, or one for every 228,000 people (*8*). In Vietnam, there are 74 dentists for 12.6 million people, or one for 170,300 people (*8*). In Thailand, there are 232 dentists for 21 million citizens, with a ratio of one dentist to 92,600 people (*8*). Similarly, India has 3681 dentists for 397 million people, or one dentist for every 108,000 people. Compare these figures with the ratio in the United States of one dentist per 1700 people! It is readily apparent that unless a radical new approach is taken in prevention and treatment of this disease, it will continue unchecked.

Scarcity of Dentists

In the past, the United States has brought a handful of dentists to this country for advanced training in our modern dental techniques. Too many of these dentists return to the metropolitan areas of their respective countries and practice high-class dentistry for their own upper-class countrymen and the international set. Meanwhile, the great masses of the people receive no professional care at all, while they suffer much dental misery. It is obvious that these millions cannot wait while a handful of students are trained for 5 to 8 years, as dentists are in the technologically advanced countries of the world. The needs are different, and a new approach must be taken.

I propose that semiliterate individuals, if necessary, could be trained to perform a useful service in the prevention of periodontal disease. Techniques for calculus removal and for demonstration of good oral-hygiene procedures, in my opinion, could be taught in a short period of time to large numbers of people. These people, citizens of the country in question, working under a well-supervised program, could perform a substantial amount of preventive dentistry in the fight against periodontal disease. We must make this rather sharp departure from traditional dental education in certain areas of Africa and Southeast Asia or no gains will be made in the dental health of the average citizen for many decades, if ever.

I believe that the "dental aides" prepared by this program could be trained in a short time (4 to 6 months) to satisfactorily remove calculus, perform simple extractions, and disseminate information on oral hygiene. After 6 months of work in the field under direct and constant supervision by fully trained dentists, the dental aide would be sent back to his village to care for the most pressing dental needs of his neighbors. He would institute a program aimed at the prevention and control of periodontal disease by regularly removing the calculus and oral debris of those in his village. In addition, he would demonstrate the oral-hygiene techniques which are so important for the prevention of periodontal disease. To relieve the suffering of those already victims of advanced periodontal disease, the aide would be able to perform simple extractions painlessly, using local anesthetics.

Another possibility would be to send dental aides, working in pairs, on a prearranged route through a large area of the countryside, where they would spend several days in each village in their "zone" and thus treat a large percentage of the people at least once a year. At these cleaning sessions, the importance of dental health and good oral hygiene would be emphasized, and perhaps some informative literature and descriptive posters distributed. Toothbrush technique would be demonstrated. The ICNND report on Vietnam (*1*) hinted at this approach when it stated:

> In view of the magnitude of the periodontal disease problem among the people of Vietnam, serious consideration should be given to the training and use of dental assistants in scaling and cleaning of the teeth.

A Training Curriculum

The training of the dental aides should be simple and radically brief compared to previous standards. Since these aides will only remove calculus and oral debris with hand instruments and perform simple tooth extractions, 4 to 6 months of intensive training should be sufficient.

The curriculum I suggest for this "short course" for dental aides is as follows:

1) Elementary instruction in the function and structure of the mouth.

2) Instruction in techniques for sterilization of instruments.

3) Elementary instruction in recognition of severe oral diseases which should be referred to supervising dentist.

4) Thorough instruction and clinical practice in the technique of calculus removal.

5) Instruction in administration of local anesthetics.

6) Instruction in methods for the control of bleeding and infection.

7) Instruction and practice in the technique of simple tooth extraction.

8) Instruction in the importance of dental health and the preventive techniques of good oral hygiene.

In order to rapidly develop a more comprehensive dental program, it is recommended that the outstanding dental aides, after a period of service, be eligible for "advanced" training of 18 months' duration which would equip them to handle more complicated oral surgery. They would also be trained thoroughly in the techniques of prosthetic dentistry so they could provide replacement teeth for victims of incurable periodontal disease.

It is possible to project this program into the future. As time goes by, the dental education of the public will create an appreciation of good dental health and, consequently, a demand for complete dental care that does not exist now; there will then be a need for thoroughly trained general dentists. An advanced dental aide who performed his duties outstandingly could qualify for the highest level of training—a 3-year course in general dentistry. These "dentists" would be trained to provide complete dental service, including the restoration of decayed teeth, and some would be prepared to administer and supervise the continuing dental-aide program.

This opportunity for advancement from one level to another in the dental-health program provides a built-in inducement for outstanding performance, because this is an unusual chance for a person in these countries to advance quickly to the relatively high status of a professional.

Before an interested country could undertake a program of this type, a careful survey similar to those conducted by the ICNND team would be

required in order to estimate accurately the extent and relative severity of the periodontal problem. It would then be possible to estimate the number of dental aides and professional supervisory personnel required to meet the needs of the country in question. The survey would also make it possible to estimate the cost of the program.

The dental aide program should be directed by dentists, since they have the knowledge and experience required to administer such a program. It has been proven in the past, notably in the U.S. armed forces, that a dental health service cannot be directed effectively by nondental personnel.

I suggest that a pilot project be arranged in an interested country to test the efficiency of a program of this type under actual field conditions. The experienced survey team of the National Institute of Dental Research could estimate the periodontal conditions and personnel required, and volunteer dentists from other countries could work closely with the dentists of the country to establish the training program and field operation of the dental aides. At the end of a year, the survey team could examine the patients treated and compare the findings for these patients with those for a control group. I think that the improvement in the treated group would be marked, even in this short period of time.

If, because of a lack of administrative talent or the necessary funds, it is not possible for an interested country to implement a full-scale dental aide program, a program for the control of periodontal disease could be incorporated into a public health or community nurse program, where one is in existence or being developed. Dental aide training, including training in exodontia for the relief of pain, under the supervision of a dentist, would be included in the curriculum of the public health officer or nurse. The public health officer, when on assignment in the rural clinics of his country, would in turn train a dental aide to work in his clinic. If no such trainee is available, the nurse would give occasional demonstrations of oral hygiene to the people in the area, in addition to performing the vital function of extracting painful teeth. Obviously, the public health officer would be so burdened with other community health problems that a true preventive dental program would stand little chance. However, public health officers would be made aware of the dental problems existing in their districts, and a start would be made in the right direction.

The assistance of the more fortunate countries of the world should be extended to every need—there should be no blind spots.

Summary

Periodontal disease is a great and as yet untreated problem in developing countries. The vast majority of the people whom we are trying to help in other ways suffer from this desease. They do not ask for help in this area because in most cases they are not aware that anything can be done about it. We must educate them to the full significance of this disease and help them eradicate it. Although the number of dentists in these countries is inadequate to cope with the problem, a program in which dental aides are trained in techniques for prevention and control of periodontal disease could help remedy the situation rapidly and economically.

When a disease affects the day-to-day comfort and physical well-being of men, women, and children in countries around the world, its treatment should be given top priority by those who are responsible for the dispersal of this aid. To those people at the grass-roots level who receive and benefit from this most personal type of assistance, the ability to eat a meal without pain, to swallow a morsel of food well-chewed, hence escaping indigestion, and to avoid the embarrassment of premature tooth loss, could make this program one of the most appreciated aspects of the entire aid program to the emerging nations.

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