

The necessity for more accurate information on the dental status and oral health care requirements of the major population groups in South Africa has become an urgent priority for future dental health planning according to the experts who attended the Oral Epidemiology Conference held under the auspices of the South African Medical Research Council (MRC) in Cape Town in October 1978.

In its recommendations the Conference proposes that a pilot study should be undertaken on a country-wide basis including samples from all the major population groups. The objectives of the survey should be to obtain reliable base-line information about caries and periodontal disease experienced in the different population groups and to assess the needs and demands of the population with respect to these diseases.

This type of national survey to be successful, would have to be conducted using standardized methods and criteria, stressing the need for a central co-ordinating body. The Conference felt that the establishment of a co-ordinating body must receive urgent attention and should, when constituted, include representatives from the Medical Research Council, the Department of Health, the Universities and the Dental Association of South Africa. This central co-ordinating body would not only undertake epidemiological surveys such as the proposed national survey and the longitudinal studies, but would also establish a dental health education centre and actively stimulate oral epidemiological research in the country. Ways of implementing these ideas are under consideration by a steering committee consisting of Prof. C.W. van Wyk, Director of the MRC Dental Epidemiology Group at the University of Stellenbosch, Prof. P.E. Cleaton-Jones, Director of the MRC Dental Research Institute at the University of the Witwatersrand, Dr. A.G. Dreyer, President of the Dental Association of South Africa, and Dr. L.T. Taljaard, Head of the Department of Health's Dental Services.

The importance of longitudinal studies in long term epidemiological planning was also stressed by the Conference. These studies should evaluate any changes in the patterns of caries and periodontal disease amongst the population, as well as the efficiency of various types of dental care delivery systems and preventive measures.

Preventive action such as our National Dental Health Week programme, aimed at the pre- and antenatal clinics, pre-school and school children was strongly advocated by the Conference delegates, as was the investigation of alternatives to water fluoridation, such as salt fluoridation, fluoride rinses and school water fluoridation. The continual development of the preventive awareness of all health service workers (doctors, dentists and nurses) as well as that of the teaching profession, by including relevant courses in their training programmes was regarded as an important priority in preventive campaigns.

The Conference also evaluated the specific epidemiological requirements pertaining to mucosal lesions. It was felt that a survey on a national scale of mucosal lesion occurrence was not necessary at this stage, but that pilot studies devoted to the investigation of specific lesions in certain population groups was relevant. This is particularly so in the cases of certain pre-malignant lesions as the introduction of preventive measures in these cases cannot be left unattended.

This issue of the *JOURNAL* is devoted to the fluoridation theme, the cornerstone of all prevention philosophies. Nationwide symposia on the importance of restoring the optimum level of fluoride in the public's drinking water were advocated by Dr. Johan de Beer, Secretary for Health, on the TV programme *SPECTRUM* last November. We hope to publish more details of the venues for these symposia shortly as it will be vitally important for the profession to actively support the fluoridation panel at these meetings.

It takes a man of great courage to challenge accepted dogma and to refute apparently irrefutable facts. Such a man exists at the Leeds University Dental School, in the person of Douglas Jackson. In a recent publication¹ he has presented substantial evidence to support a new theory concerning the nature of dental caries. Jackson has tried to understand more fully the seemingly unaccountable patterns of dental caries seen in patients and to stimulate fresh lines of enquiry into a disease which is more complex than is generally thought and one in which influencing factors exist beyond the immediate and circumscribed environment situated on the surface of a tooth. His article is well worth study to force one to examine more closely one's personal convictions and to see just how well they stand up to scrutiny.

In the first part of a 30 page article Jackson examines evidence to support the generally held acidogenic theory according to which there is a breakdown of carbohydrate into acids which demineralise the outer surface of a tooth followed by proteolytic digestion of the enamel. To those who uphold this

traditional view of caries the Vipeholm study is sacrosanct. Jackson has said this is not unreasonable because the Vipeholm study is the only major clinical trial that appears to have proved the acidogenic theory. Jackson examines this mammoth study and points out the *bitty* nature of the investigation which contained groups receiving sucrose, bread, chocolate, caramels, 8 toffees per day and 24 toffees per day. The selected groups comprised adults (of an age when dental caries incidence is normally zero or very low) who had an average of 25 cavities, only one or two of which were filled! Many of the subjects were so mentally ill that they ate their meals without the use of knives, forks or spoons and even bolted their food without chewing. To overcome this method of eating, toffees were made so large that they could not be swallowed whole. Less than 20% gave any attention to oral hygiene. The sophistication in planning of clinical trials that now exists would have ruled out the Vipeholm study. Jackson even says that had the Vipeholm study been negative in its conclusions it would have been cast aside and forgotten.

Within a year of the Vipeholm study the British MRC issued a report on the effect of sugar supplements on dental caries in

Jackson, D. (1978) Sugar and dental caries, myth and fact. *The Probe* July 1978, 1-30.

children. This stated that relatively great differences in total sugar intake of children in institutions had no significant effect on the initiation or spread of dental caries over periods of one to two years. Jackson feels that the report appears to have had little impact, judging from the way it has been ignored in most reviews on sugar and caries and probably lies dusty and untouched on the shelves of many libraries.

Between meal eating ("snacking") and caries initiation is taken to be the most common detrimental effect in dental caries. Jackson's review of all the evidence available regarding these factors has neither proved nor disproved the hypothesis. *What about total sugar consumption and dental caries?* Of all the studies available, the only study² that Jackson cannot fault is that carried out on a group of children who were given a lacto-vegetarian diet, low in refined carbohydrates, with "snacking" between meals confined to raw fruit and milk. Although the numbers of children were small the negative association between caries experience and the low carbohydrate diet was clear.

Jackson and his collaborators at Leeds University have overcome many of the problems of marrying the various causative theories. Their evidence is striking and can be explained only on the basis that each site on each tooth is genetically endowed with a characteristic that determines whether or not it is at risk to caries. The evidence that Jackson presents is based on the clinical records of 250 000 National Dental Health records and is limited to the smooth surfaces of the anterior teeth, about which there can be no doubt regarding the diagnosis of caries, i.e. *no confusion as to whether or not the probe sticks*. Diagnoses in his study were made by a large number of dentists and reliance was placed on a consensus standard of diagnosis on which all dental epidemiologists have to rely when they carry out prevalence studies. What has been decided is that each person is predisposed to a particular pattern of caries which, once achieved, does not change. It is suggested that the only predisposition which can account for such precise numerical constancies is one that is genetically determined. The studies do not rule out completely the role of

environmental factors in the *timing* of dental caries although they rule out environmental factors in the determination of the *siting* of the caries. In Jackson's review caries initiation distribution cannot be directly and quantitatively related to total sugar (sucrose) consumption not to the frequency of consumption.

In a very humble ending he says that they do not know, nor claim to know, the precise etiology of dental caries. Far from making such a claim they suggest that possibly only now are they on the long ladder leading to complete understanding. But they are quite certain that the acid theory, together with its attendant hypotheses, is wrong either completely or partially. Jackson suggests that we cannot begin to achieve true understanding until we forsake our parochial notion that dental caries is the direct outcome of a simple surface battle between acid and enamel and until we begin to consider the tooth as a complex biological system, belonging to a larger and more complex biological whole.

All this may sound heresy but in it is more than a grain of truth. How can we explain the low caries prevalence in many of our Black groups in South Africa, on apparently similar sucrose intakes to their White counterparts, both in total quantity and frequency? How can we equate the low prevalence of labial caries in certain of our urban Black groups to the high labial caries prevalence in urban White and rural Black?

Axelsson and Lindhe³ showed a very dramatic caries reduction by almost perfect plaque control. Most studies reported in the literature indicate that plaque was the one factor that was not controlled, particularly as far as the quality was concerned. For instance, we know that plaque from various sites in one mouth vary considerably qualitatively. Perhaps the equivocal results of the various sucrose reports may be explained by this factor?

There are so many unknowns but now perhaps the time has come for us to look more closely at our established values and to re-examine them carefully, coldly and with wisdom.

2. Institute of Dental Research, Sydney (1952 - 1956).

3. *Journal of Clinical Periodontics* (1974), 7, 126-128.



WERKSKURSUS IN FORENSIESE ODONTOLOGIE

Fakulteit Tandheelkunde,
Universiteit van Stellenbosch,
4 tot 7 Junie 1979

'n Teoretiese en praktiese kursus van drie en 'n half dae in forensiese odontologie wat tandheelkundige, geneeskundige, polisie- en wetlike aspekte insluit, word gehou. Die program word deur prof. Reidar Sognaes, professor in Mondbiologie aan die Universiteit van California, sowel as lokale dosente aangebied.

Registrasiegeld is R30 per persoon. Kursusgangers sal tot 15 beperk word. Vir verdere navrae nader Prof. C.W. van Wyk, Fakulteit Tandheelkunde, Privaatsak XI, Tygerberg, 7505, Kaap. Telefoon (021)93-3138.

WORKSHOP IN FORENSIC ODONTOLOGY

Faculty of Dentistry, University of Stellenbosch,
4 to 7 June 1979.

A three and a half day theoretical and practical course in forensic odontology which will include dental, medical, police and legal aspects. The programme will be presented by Professor Reidar Sognaes, professor of Oral Biology of the University of California and local lecturers.

Registration fee R30 per person. Participants will be limited to 15. For further information contact Prof. C.W. van Wyk, Faculty of Dentistry, Private Bag XI, Tygerberg, 7505, Cape. Telephone (021)93-3138.