Symposium arranged at the 82nd Annual Meeting of the Scandinavian Association of the International Association for Dental Research (NOF) in association with the Swedish Association for Preventive Dentistry, 20–22 August 1999, Naantali, Finland

Fluoride—the New Millennium Perspective

Dental research in the Nordic countries has mainly focused on the prevention of oral diseases such as dental caries. Regular meetings have been organized by the Scandinavian Division of the International Association for Dental Research (NOF) to sum up recent research and facilitate the clinical implementation of new knowledge. In 1997, at the 80th Annual Meeting of NOF in Reykjavík, Iceland, a Symposium, entitled "Is caries prevention effective and cost-effective?" was organized jointly with the Nordic Society of Dentistry for Children. One of the main conclusions from this meeting was that population-based strategies were still necessary, although some "targeting" was desirable, especially for professional measures of caries prevention. It was stated that the excellent development of dental health in the Nordic countries that had been achieved and so expensively won during the postwar period could easily be lost if healthcare administrators and politicians were not willing to support the results of dental research and consequently make oral health priorities an integrated part of general health development. This symposium was followed by a another one held in Naantali, Finland, this year and organized by NOF along with the Swedish Association for Preventive Dentistry entitled "Fluoride—the new millennium perspective". The main aim of the Symposium was to focus on both basic and clinical fluoride research in order to further strengthen the importance and utilization of preventive measures both individually and on a population level.

The following papers were presented at the Symposium:

1. Dr Bob ten Cate (Amsterdam): Current concepts on the theories of the mechanism of action of fluoride.
2. Dr Jan Ekstrand (Stockholm): Fluoride in the oral environment.
3. Dr Björn Ögaard (Oslo): Experimental intra-oral caries models in fluoride research.
4. Dr Nina J. Wang (Oslo): Government policies on fluoride utilization in the Nordic countries.
5. Dr Helena Forss (Kuopio): Efficiency of fluoride programs in the light of reduced caries levels in young populations.
6. Dr Ken W. Stephen (Glasgow): Fluoride prospects for the new millennium—community and individual patient aspects

Drs Bob ten Cate and Jan Ekstrand both emphasize that the dominant part of the cariostatic activity of fluoride is a function of its local action at relatively low fluoride concentration in the fluid-phase environment of the enamel, while root surfaces are better protected with high fluoride concentration. Furthermore, frequent (daily) applications of fluoride exploit the main working mechanisms of fluoride, i.e. the control of demineralization and the promotion of remineralization. Both presenters suggested more research heading towards explaining the working mechanisms of fluoride at the site of caries initiation and progression both in enamel and root dentine.

Dr Ögaard gives a complete and highly interesting review of almost all possible intra-oral caries models and thus important methods for fluoride research. He points out the short-comings and advantages of the methods. During recent decades the caries situation has changed in western countries, thus making "classical" research methods difficult to use. He suggests that caries research today should focus on experimental caries models able to mimic severe cariogenic challenge. Therefore, a practical consequence for fluoride research is that studies of combinations and dosage of fluoride to prevent caries lesion formation are preferable.

Dr Nina Wang presents an excellent review of the government policies of the different Nordic countries on fluoride utilization and points out some relevant similarities, such as the gradual change of opinion from systemic to local fluoride application methods, a more pronounced individualization, a general reduction of fluoride doses, and stimulation for a more pronounced self-care policy of fluoride administration. Typical differences between the Nordic countries are fluoride dosages, concentrations of fluoride, application frequencies, age limits and, to some extent, indications. Dentists in the Nordic countries generally recommend F-toothpaste to their patients, while fluoride supplements are recommended only in Norway and Iceland. Sweden is the country using most methods for fluoride delivery. All Nordic countries but Iceland had developed fluoride strategies according to individual needs. In conclusion, Dr Wang finds that the use of fluoride in the Nordic countries in general is evidence-based and that a gradual equalization of caries preventive programs is occurring.

Dr Helena Forss defines the differences between "efficacy", "effectiveness", and "efficiency" and sum-

marizes the literature in respect of these expressions. She concludes that both population strategy-based and high-risk strategy-based programs today may show low efficiency in the light of the low caries prevalence in the Nordic countries. Another statement is that if caries prevalence is moderate the cost for prevention is equal to restorative treatment and that few preventive programs have been shown to be efficient in populations exposing high rates of caries. However, sound teeth have a great value to people and further research is necessary to maximize input of prevention compared to output of health effects.

Dr Ken W. Stephen discusses the use and benefits of different modes of community-based procedures for fluoride supplementation, i.e. salt, milk, and water fluoridation, on population level and relates the results to the centrally-delivered means of fluoride dispensing, e.g. via schools, healthcare centers, and individual fluoride prophylaxis modes. He emphasizes that there is not enough evidence-based data on different prophylactic modes or regimens, nor on concentrations levels for final conclusions to be drawn on caries prevention or fluorosis induction. He also introduces an interesting new method for an atraumatic therapy of fluorosis with highly esthetical and functional results.

The Swedish Patent Revenue Fund and the Foundation of Acta Odontologica Scandinavica are gratefully acknowledged for financial support to the symposium and publication of this volume.

Marianne Lenander-Lumikari, Institute of Dentistry, University of Turku, Lemminkaisenkatu 2, FIN-20520 Turku, Finland. E-mail. marlen@utu.fi

Lars G. Petersson, Odontologiska Specialisttandkliniken, Länssjukhuset, SE-30185 Halmstad, Sweden. E-mail. lars.g.petersson@lthalland.se