Abstracts on this page have been chosen and edited by Dr Trevor Watts

Preventive medicine; preventive dentistry

Community water fluoridation, bone mineral density, and fractures: prospective study of effects in older women

Phipps KR, Orwoll ES et al.
BMJ 2000; 321: 860-864

In a better-controlled study than most, fluoridation did not appear to cause bone fractures and may even reduce the incidence of some types.

This was a prospective study of 9,704 white women, of mean age 74 yrs, recruited in four US areas in 1986-8 and followed up for non-spinal fractures a mean of 7 years, and for spinal fractures (by radiographic interpretation) a mean of 4 yrs. Fluoride exposure over the 20 years from 1971 to 1990 was identified for 3 groups: continuous ($n = 3218$), none (2563) and a mixture of both (1348). The respective percentages of women in each group who sustained fractures during the observation period were 22.6, 22.3 and 24.3 (NS).

There were several small differences between the groups with continuous and no exposure, which were taken into account in statistical analysis. Women with continuous fluoride exposure had a 31% reduced risk of hip fracture, a 27% reduced risk of vertebral fracture, and non-significant trends towards fewer humerus and more wrist fractures. Bone mineral density was significantly increased in the former group by up to 2.6% in femoral and lumbar spine sites, and reduced by up to 1.9% in radial sites.

Overall, the results confirm the safety of fluoridation in respect of osteoporosis-related fractures, but the authors also point out that hip fractures constitute most of the burden of osteoporosis, and therefore the reduction in this type of injury may have considerable public health significance.

Orthodontics

Radiographic factors affecting the management of impacted upper permanent canines

Stivaros N, Mandall NA
J Orthod 2000; 27:169-173

Labio-palatal crown position and angulation to the midline were related to decisions to expose or remove these teeth.

Radiographs were retrospectively examined for 44 patients with impacted permanent canine teeth referred to 3 consultants in a UK university orthodontic department from 1994 to 1998. Assessments included: angulation of tooth to midline (2/3 > 30°), position of apex (2/3 above 1st premolar), vertical height of crown above adjacent incisor (2/3 below half the root length), horizontal overlap of incisor (1/2 complete overlap), root resorption of incisor (1/4 affected), labio-palatal position of crown (3/5 palatal) and labio-palatal position of root (4/5 palatal).

Half the teeth were removed, and half were exposed for orthodontic alignment. A regression analysis identified 2 factors which were related to this treatment decision. A crown position which was labial or in the arch line meant the canine was very likely to be removed, and palatal position meant exposure was more likely; and as angulation to midline increased, removal was more likely. The authors comment that other factors usually considered important, such as crown overlap of incisor root, or high crown position, did not appear related to the decision.

Developmental pathology

The long-term survival of lower second primary molars in subjects with agenesis of the premolars

Bjerklin K, Bennett J
Eur J Orthod 2000; 22: 245-255

Primary molars retained to age 20 are likely to survive indefinitely.

In this study, 41 subjects (2/3 female) with agenesis of one or both lower second premolars and 59 retained primary second molars, were examined every 2 years for a mean of 9 yrs (range 2-20) from recruitment at 11-12 yrs age.

During the follow-up, 2 primary molars were exfoliated and 5 were extracted, 2 being replaced by 3rd molar transplants. No teeth were lost after age 20 yrs. Root resorption showed marked individual variation and affected all teeth by age 19-20. At 11-12 yrs, mean infra-occlusion was 0.47 mm, rising to 1.43 mm at 17-18. By age 19-20, 40 teeth remained in the follow-up, and 18 showed no infra-occlusion, the other 22 ranging from 0.5 to 4.5 mm. At 11-12 yrs, the first premolar and first permanent molar were 10.35 mm apart, reducing to 9.95 mm at 17-18.

The authors point out that their subjects do not constitute a random sample of children with second lower premolar agenesis, but conclude that most changes in respect of the retained primary second molars occurred before 20 yrs, and therefore such teeth retained to that age have a good prognosis.

Preventive dentistry

Xylitol candies in caries prevention: results of a field study in Estonian children

Alanen P, Isokangas P et al.
Community Dent Oral Epidemiol 2000; 28: 218-224

The use of sweets containing xylitol reduced caries by up to 60%.

Xylitol as a non-sugar sweetener has been tested in field trials only in chewing gum where it has shown promise in reducing caries. Estonia has a population of 1.5 m, which is well-educated and the economic situation has been improving rapidly since independence from the former Soviet Union in 1991.

A total of 740 children aged 10 yrs commenced the present study of xylitol-containing sweets, and 567 continued in it to 3 years. Of these, 115 used chewing gum, 139 used 2 different xylitol sweet formulations for 3 years, 167 used these sweets for 2 years only, and 146 were controls who were simply examined. The authors mention that xylitol-containing sweets are expensive and rare at present in Estonia, and were unlikely to have been used by controls. Sweets and gum were given under teachers' supervision, and the daily xylitol dose was 5 gm on 200 days of the school year.

The mean control group 3 yr caries increment was 4.42 DMFS, compared with 1.87 for gum, and 1.72-2.77 for the 4 sweet groups. No systematic trends were observed between the xylitol groups. The authors consider that xylitol may be used in sweets as well as gum, and emphasize the merits of school-based delivery.