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Abstracts from other journals

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Abstracts are presented as originally published or with only minor modifications

Bioactive properties of milk proteins with particular focus on anticariogenesis. Aimutis WR. *Journal of Nutrition* 2004; **134**: 989S–995S.

Beyond nutrition, there is an increasing amount of data and information to demonstrate a bioactive role for dairy components in adults including a role in prevention of dental caries. Specifically, the casein fraction and hydrolysates thereof have been the focus of researchers investigating cariogenicity prevention. Tooth enamel is a polymeric substance consisting of crystalline calcium phosphate embedded in a protein matrix. Dental caries develop by acidic demineralization (calcium and phosphorus solubilization) of tooth enamel. Demineralization occurs directly (acidic food consumption) or indirectly (by fermentation products of dental plaque odontopathogenic bacteria growing on residual food particles between teeth or adhering to the plaque). Research efforts with milk derived bioactive peptides have focused on inhibition of cariogenic, plaque-forming bacteria, inhibition of tooth enamel demineralization, and subsequent enamel remineralization. Caseinophosphopeptides (CPP) and glycomacropeptide (GMP) have been patented for use in common personal hygiene products to prevent dental caries. Research has shown CPP and GMP to be growth inhibitory to the cariogenic bacteria Streptococcus mutans and other species. Additionally, CPP forms nanoclusters with amorphous calcium phosphate (AMP) at the tooth surface to provide a reservoir of calcium and phosphate ions to maintain a state of super saturation with respect to tooth enamel. This would buffer plaque pH, and also provide ions for tooth enamel remineralization. Glycosidic structures attached to GMP are important to numerous bioactive properties of the peptide including anticariogenicity. Like CPP, GMP has shown inhibitory activity to enamel demineralization and promotes tooth enamel remineralization.

Dental caries and enamel fluorosis among the fluoridated and non-fluoridated populations in the Republic of Ireland in 2002. Whelton H, Crowley E, O'Mullane D, Donaldson M, Kelleher V, Cronin M. *Community Dental Health* 2004; **21**: 37–44.

A national survey of oral health of children and adolescents was carried out in the Republic of Ireland (RoI) in 2001/2002. The aims of the survey were to: compare the prevalence of caries between child and adolescent residents in fluoridated and non-fluoridated communities whilst controlling for disadvantage; compare caries levels amongst disadvantaged and non-disadvantaged groups with and without water fluoridation; report the changes in caries levels between the 1960s and 2002; report changes in dental fluorosis levels between 1984 and 2002. A cross sectional oral health survey of a representative, random, stratified sample of 17 851 5-, 8-, 12- and 15-year-old children and adolescents in RoI was carried out. WHO examination criteria with the addition of visible, non-cavitated dentine caries were used for recording caries. Fluorosis was measured using Dean's Index. In the RoI the mean dmft/DMFT scores for 5-, 8-, 12-, and 15-year-olds were 1·2, 0·3, 1·1 and 2·3. For those with domestic water fluoridation since birth the scores were 1·0, 0·3, 1·1 and 2·1 respectively. In non-fluoridated areas of RoI the mean dmft/DMFT scores for 5-, 8-, 12-, and 15-year-olds were 1·7, 0·3, 1·3 and 3·2,

respectively. For 5-, 12- and 15-year-old age groups dental caries levels were lower amongst children with fluoridated domestic water supplies (all $P < 0{\cdot}0001$). The prevalence of dental fluorosis has increased in RoI since 1984. 23% and 36% of 8- and 15-year olds respectively in fluoridated areas had Dean's Index scores at the questionable or greater level in 2002, compared with 6% and 5% respectively in 1984. Caries levels are lower among children with fluoridated domestic water supplies. Decay levels are much lower in 2002 than they were in 1984 and in the 1960s. The oral health of the less well off is worse than that of the rest of the population. The prevalence of dental fluorosis is higher amongst children and adolescents with fluoridated water supplies. Comparisons with 1984 data show an increase in the prevalence of fluorosis since that time.

3D X-ray microscopic study of the extent of variations in enamel density in first permanent molars with idiopathic enamel hypomineralisation. Fearne J, Anderson P, Davis GR. *British Dental Journal* 2004; **196**: 634–638.

The aim was to measure mineral concentration distributions within teeth with idiopathic enamel hypomineralisation, a condition in which developmental defects are seen in first permanent molars, and/or incisors. X-ray microtomographic and 3D x-ray microscopy were used to measure the extent of hypomineralisation in two affected molars and two contralateral controls extracted from the same patient. The control molars were visibly normal. The affected molars showed hypomineralised yellow opaque enamel with regions of breakdown. X-ray microtomographic images showed: 20% reduction in mineral content of affected enamel (most cases involved full enamel thickness); hypomineralised enamel had a mineral concentration gradient opposite to that of normal enamel; regions of hypomineralisation distributed randomly throughout affected teeth, (apart from cervical region which was less severely affected). The pattern of mineral concentration suggests a disturbance during the maturation process. Differences in susceptibility of the ameloblasts during different stages of dental development may explain the asymmetric distribution of the defects. Topical fluoride applications may help promote post eruption maturation of the surface layer in these teeth. The use of fissure sealants and adhesive materials appears to prevent further breakdown.

How much do parents know about their children's heart condition and prophylaxis against endocarditis? Bulat DC, Kantoch MJ. *Canadian Journal of Cardiology* 2003; **19**: 501–506.

Caregivers are frequently expected to serve as a conduit for information between heath care providers; however, few previous studies showed inadequate parental knowledge about their children's heart disease. The aims were to assess parental knowledge regarding their children's congenital heart disease, risk of bacterial endocarditis (BE) and requirement for BE prophylaxis. Parents of 65 consecutive children with heart disease, aged from two months to 16 years, were asked to complete a survey while awaiting their ambulatory appointment. On average, patients had been seen by 1·7 cardiologists and had attended 7·8 clinic appointments before the study, with 55% having undergone heart surgery and 18% currently taking cardiac medications. In general, caregivers felt they had received full explanation of their child's condition (89%) and were informed sufficiently about ongoing care (91%), yet only 71% knew the specific name of their child's heart defect, with 65% being able to correctly explain the condition in layman's terms. Of the 55 children whose heart defects fulfilled risk criteria for BE, only 47% of their parents declared to have ever heard of the disease, with just 25% able to correctly define it. Although 71% of the children's parents knew that special medication was required when seeing a dentist, only 29% were aware of any other situations when they would also require it. As many as 27% of the children who required BE prophylaxis had had significant dental problems in the past, including root canals, extracted teeth, braces, caps and gingivitis. Many parents are not familiar with their child's heart disease and do not understand the risks of BE or the need for BE prophylaxis. Results of this study and several other queries published over the past 20 years point to the need for continuous education of patients and their parents by physicians, nurses and allied health care providers.

A randomized controlled trial comparing mandibular local anesthesia techniques in children receiving nitrous oxide-oxygen sedation. Naidu S, Loughlin P, Coldwell SE, Noonan CJ, Milgrom P. *Anesthesia Progress* 2004; **51**: 19–23.

The aim of this study was to test the hypothesis that dental pain control using infiltration/intrapapillary injection was less effective than inferior alveolar block/long buccal infiltration anaesthesia in children. A total of 101 healthy children, aged 5–8 years, who had no contraindication for local anaesthetic and who needed a pulpotomy treatment and stainless steel crown placement in a lower primary molar were studied. A 2-group randomized blinded controlled design was employed comparing the two local anaesthesia techniques using 2% lidocaine with 1:100 000 epinephrine. All children were given 40% nitrous oxide. Children self-reported pain using the Color Analogue Scale. The study was conducted in a private paediatric dental practice. Overall pain levels reported by the children were low, and there were no differences between conditions at any point in the procedure. Pain reports for clamp placement were block/long buccal 2·8 and infiltration/intrapapillary 1·9 ($P = 0·1$). Pain reports for drilling were block/long buccal 2·0 and infiltration/intrapapillary 1·8 ($P = 0·7$). Nine percent of children required supplementary local anaesthetic: 4 of 52 (7·7%) in the block/long buccal group and 5 of 49 (10·2%) in the infiltration/intrapapillary group ($P = 0·07$). The hypothesis that block/long buccal would be more effective than infiltration/intrapapillary was not supported. There was no difference in pain control effectiveness between infiltration/intrapapillary injection and inferior alveolar block/long buccal infiltration using 2% lidocaine with 1:100 000 epinephrine when mandibular primary molars received pulpotomy treatment and stainless steel crowns.

Modification of soft drinks with xanthan gum to minimise erosion: a study in situ. West NX, Hughes JA, Parker D, Weaver LJ, Moohan M, De'Ath J, Addy M. *British Dental Journal* 2004; **196**: 478–481.

The aim was to compare the erosive effect of a new blackcurrant/calcium drink with xanthan gum, on enamel in situ, with a low erosive product, a conventional fruit beverage and water. The study was single centre, randomised, single blind, 4 treatment crossover design. It was conducted in 2000, employed volunteers working at the Bristol Dental Hospital, UK. Sixteen subjects (> or = 18 years) wore two enamel samples in a removable acrylic appliance. The drinks tested were (A) New blackcurrant/calcium/gum drink (test product), (B) Original blackcurrant/calcium drink, (C) Conventional blackcurrant drink (positive control) and (D) Water (negative control), for 15 day study periods. Drinking was supervised, with 250 ml imbibed four times/day between 9·00 am–5·00 pm. Profile measurements of specimens were made at baseline, 5, 10 and 15 days. Paired t-tests compared erosion by surfometry with selected pairs of formulations. Of 16 screened subjects (3 male, 13 female), mean age 34·2 years, 1 subject failed to complete the study. A caused significantly less enamel loss than C, with no statistically significant differences from B at any time points measured. Of 43 treatment emergent adverse events, none were considered related to the study formulations. A retained low erosive properties similar to B, with additional benefits of taste flexibility and beverage stability.

Class II restorations in primary teeth: 7-year study on three resin-modified glass ionomer cements and a compomer. Qvist V, Laurberg L, Poulsen A, Teglers PT. *European Journal of Oral Sciences* 2004; **112**: 188–196.

The aim of this randomized study was to compare the longevity and cariostatic effects of 1565 class II restorations in primary teeth placed by 15 clinicians in the Danish Public Dental Health Service in 971 children, aged 3·6–14·9 yr. The restorations were performed using three resin-modified glass ionomer cements and one compomer (polyacid-modified composite resin) with and without their respective cavity conditioners. The restorations were in contact with 1023 unrestored proximal surfaces in 853 primary and 170 permanent teeth. The study was terminated after 7 yr with 1% of the restorations in function, 7% patient dropouts, 18% failed restorations, and operative treatment on 24% of the adjacent surfaces. Multivariate survival analyses showed that the restorative material and cavity conditioning influenced the survival of restorations but not the

progression of caries on adjacent surfaces. The 50% survival times were estimated to exceed 5 yr for the restorations and 4·5 yr for the adjacent unfilled surfaces in all treatment groups. It was concluded that resin-modified glass ionomer cement and compomer are both appropriate materials for class II restorations in primary teeth. The differences in longevity and cariostatic effects among the four materials used with and without conditioner were less than the intra-individual differences between clinicians.