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Comment

News from the IADR

Every year, the International Association for Dental Research (IADR) holds a research meeting. In June this year, the meeting was held in stunningly beautiful Cape Town. Presenters submit a 300 word abstract, and if this is accepted, they present their findings as a 15 minute oral presentation or as a research poster. I was fortunate enough to have two abstracts accepted, so was able to spend three days at the meeting. I now present some of the information that I picked up from some of the 1674 abstracts presented, these also being available on the IADR website (www.IADR.org) 2014. I therefore present the papers which I attended and found to be of interest, given my background in dental materials, and their application to clinical dentistry and in primary dental care.

Regarding dental materials, there were the usual substantial number of papers on dentine bonding, and bond strengths of various materials to tooth substance. My own view is that the most relevant appraisal of a bonding agent is its potential to retain restorations in non-retentive cavities, such as Class V. One such paper (abstract 1157) examined the survival rates of 104 restorations, with retention rates of 86% and 89% at 5 years, the higher value (although not statistically significant) being when the enamel margins were etched. However, what was significant was that, in the non-etch group, the enamel margins showed more marginal discoloration and more marginal defects than in the group where the enamel margins had been etched. Other papers confirmed this with other materials. My conclusion – while I do not have data for every dentine so-called self-etch bonding agent (there are about 50 of them on the market at the last count!), I feel that there is sufficient evidence to support selective enamel etching if we want to optimize our enamel margins during clinical use of these materials. When I think about it, it makes sense, as we have known the effectiveness of etching with phosphoric acid for almost 60 years!

Regarding resin composite materials, clinicians can breathe a sigh of relief if they are using a resin composite material containing BisGMA. One paper (310) evaluated the safety of BisGMA with regard to its potential to release Bisphenol A (BPA), a precursor which is oestrogenic. Published data advises that BisGMA typically contains <2 ppm of residual BPA. This paper estimated the margins of exposure to BPA via leaching into saliva in the short and long term and confirmed the safety of BisGMA-based composite materials with respect to potential BPA exposure. Also in the field of resin composites, a novel bulk-fill composite manufactured based on nano-filler technology and new monomer chemistry, known as addition fragmentation monomer (AFM) chemistry, was presented in paper 210. A general trend is that materials with low wear have high polymerization shrinkage stress (PSS) (if high, a potential cause of post-operative sensitivity). This novel material was found to have lower wear than expected for its low PSS – another step towards a potential amalgam replacement, perhaps?

On that subject, the attitudes of Australian dentists to a phase-down of dental amalgam were evaluated by way of an online questionnaire, with responses being obtained by 381 (abstract 1507). Key findings were that 44% of these respondents ‘strongly disagreed’ or ‘disagreed’ with the statement that a phase-down of amalgam was a ‘good thing’, while 50% ‘strongly agreed’ or ‘agreed’ that such a phase down would make ‘no significant difference’ to their practice. Responses diverged when asked if adequate alternative materials existed, with 50% stating that they ‘disagreed’ or ‘strongly disagreed’ and 40% agreeing that alternative materials existed. Perhaps the responses would be similar in the UK, or perhaps we should re-run the survey in the UK?

There appeared to be a resurgence in research on reinforced glass ionomer materials, principally on a new material formulation (abstract 319) and on the effect of a resin coating on the surface of these materials. This did not appear to enhance wear resistance (321), this being potentially important information for those planning to place glass ionomer restorations in loadbearing situations in posterior teeth.

Last from the dental materials sessions, useful information (abstract 209) from testing the microhardness of bulk-fill materials, which confirmed that brighter doesn’t...
always mean better with regard to light curing units (LCUs), since the conclusion was that longer curing times resulted in increased microhardness relative to higher irradiance LCUs using shorter curing times. We were also warned (abstract 1392) that the dental market is being flooded with budget curing lights available on the internet, not all of which may be of appropriate quality.

Outside the dental materials field, abstract 21 summarized a symposium on Human papilloma virus (HPV) infection/Oral sex/Oral cancer. In this regard, head and neck cancers are the 8th most important cancer worldwide, representing 8% of male cancers, with high mortality and morbidity impacting on quality of life. The main risk factors for oropharyngeal cancer are tobacco and alcohol, but HPV is becoming an increasing risk factor. This has major health and educational implications, but public and health professionals may not be aware of the extent of the problem, and dental professionals may be reluctant to talk about HPV infection in the context of oral sex as a risk factor. (Indeed, dental professionals may feel that they have enough to talk to their patients about!) The need for more open discussion on the subject was discussed, especially in light of the fact that the annual incidence of oral cancer associated with HPV infection will exceed the incidence of cervical cancer by the year 2020 in the US. Dental Update will shortly publish a paper on this subject.

The endodontists really came into the spotlight in some research on cardiovascular mortality (abstract 35) from the Universities of Helsinki, Boston and Edinburgh. They presented the concept that, if inflammation is implicated as a risk factor for cardiovascular disease (CVD), then elimination of dental periapical inflammation should affect CVD patient survival. The researchers, fully adjusting for age, sex, smoking, diabetes, hypertension and other factors, conducted a case-control study of 306 over 60-year-olds, collecting data from 1995 and following the patients for 15 years. Their results appear to have put the endodontists on the map! Those patients who had endodontic treatment that eliminated periapical inflammation demonstrated a 67% improvement in CVD survival. However, the researchers warned that future large studies are warranted.

The importance of our periodontists was also demonstrated in the paper (166) from the University of Newcastle upon Tyne which assessed trends in periodontal disease in adults aged between 27 and 70 between 1998 and 2009, using data from the UK National Adult Dental Health Surveys. The analysis revealed that the prevalence of severe periodontitis increased in each age group, despite the prevalence of moderate periodontitis decreasing. The surprise to me was that the increase in severe periodontitis occurred while plaque control improved: the authors add, in their conclusion, that this could potentially be attributed to increased tooth retention.

There was interesting information presented on implant-supported bridge survival (abstract 156) over a period of 12 years. The authors, from the University of Cologne, followed tooth/implant-supported bridges in 175 patients, with some of the bridges having a non-rigid attachment at the tooth. Optimum success rates were seen for the implant-supported bridges (94%), followed by tooth/implant-supported bridges with a non-rigid attachment (92.5% success rate), with the authors concluding that tooth/implant-supported bridges showed optimum survival when equipped with a stress-breaking attachment at the implant abutment, potentially an important clinical message for those readers who are placing such prostheses.

It seems to me that there is an increasing interest in prevention of tooth substance erosion using toothpaste, so it was interesting to attend a symposium on research which is being carried out on the use of calcium silicate. Professor Patrick Unwin, from the University of Warwick, presented data which indicated the transformation of this source of calcium into hydroxyapatite, this then adhering to the tooth enamel. A potentially exciting development which we were told would soon be incorporated into a toothpaste and a gel: I also wondered if it could be adapted for a self-healing dental material?

Lastly from the IADR, I bring you a paper of massive potential importance (075: in which I disclose an interest – as co-author!) presented by Dr Steve Lucarotti. The perceived wisdom, for many years, has been that the best estimate of a dental patient’s risk of future dental disease is their previous dental history. Steve has developed a massive dataset (the largest ever developed for dental research) from NHS payment data which has enabled over 3 million patients to be followed through 25 million courses of treatment. In this paper, 455,844 patients fulfilled the inclusion criteria of patients over 18 years who attended in two-two-year periods 1991/1992 and 2004/2005. Treatment was defined as ‘Active’ (restoration, extraction, prosthesis) or ‘Non-active’ (prevention, diagnosis) and these patients had over 9.3 million courses of treatment available for analysis, enabling their treatment history to be correlated with outcome. Interestingly, the results showed, loud and clear, that future treatment costs are correlated with past treatment costs and that ‘Active’ treatment cost is even more strongly correlated with past ‘Active’ treatment costs. The conclusion tells us that ‘Active’ treatment is the most important component and should be distinguished from preventive and diagnostic treatments.

Not all of the information presented at the IADR had an obvious clinical relevance. However, I hope that what I have brought to you can be applied to your care of patients – what Dental Update is famous for!

Finally, following a seeming dearth of papers in Dental Update on post-retained crowns, we published a super paper on the assessment of the failing post-retained crown. We published a super paper on the assessment of the failing post-retained crown. We presented data which indicated the transformation of this source of calcium into hydroxyapatite, this then adhering to the tooth enamel. A potentially exciting development which we were told would soon be incorporated into a toothpaste and a gel: I also wondered if it could be adapted for a self-healing dental material?

In the present issue and a follow-up in the next issue. I make no apology for this – post crowns are among our least successful restorations and the more we can learn about the reasons why they fail, and what to do about it when they do fail, the better! Probably the lesson is to avoid placing a post if possible, and if we have to, advise the patient that there is ‘little up our sleeve’ if and when it fails. The term is expectation management!

References