Oral Health Research Review

Making Education Easy

Issue 14 – 2012

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Oral Health Research Review is also made available to Dental Hygienists through the kind support of the New Zealand Dental Hygienists' Association

Welcome to issue 14 of Oral Health Research Review.

Childhood dental neglect in the UK has been put under the spotlight in one of the papers selected for this issue. Closer to home, Australian researchers have: i) revealed marked social disparities in oral health that appear as early as 2 years of age and persist throughout school-age years; and ii) identified that the main reported reason for avoidance and delaying of dental visits among adults was cost. We also feature an important paper from Brazil that reported disturbingly low rates by dental professionals of reporting cases of suspected child abuse to the appropriate authorities.

We would like to thank our readers for their comments and feedback, and hope that you continue to share your thoughts with us.

Kind regards,

Jonathan Leichter D.M.D

jonathanleichter@researchreview.co.nz

Evaluation of ocular hazards from 4 types of curing lights

Authors: Labrie D et al

Summary: These researchers exposed extracted human maxillary teeth mounted in a dentoform to four types of light curing units (LCUs) to cure simulated restorations and calculated weighted blue-light and effected UV irradiances that a dental practitioner's eyes would receive. None of the LCUs tested were found to be associated with UV-mediated ocular damage. The higher powered lamps exhibited potential to cause blue-light-mediated ocular damage after cumulative viewing of only 6 seconds at 30cm from the tooth during an 8-hour workday.

Comment (JL): LCUs are in daily use in the dental setting, and their potential to cause ocular damage needs to be considered in terms of risk management and operator protection. Blue light, absorbed by the retina, can amplify retinal aging and degeneration, while UVA radiation causes corneal injury and cateractogenesis. Both forms of light are emitted by LCUs. The authors of this paper evaluated four LCUs – plasma arc, low- and high-powered LEDs and quartz-tungsten-halogen. They simulated curing of a restoration in an extracted maxillary central incisor from both palatal and labial directions. A laboratory-grade light detector was used to measure irradiance at distances equivalent to the eyes of the operator, the dental assistant and an onlooker. It was found that none of the LCUs tested exceeded the ISO limits for irradiation, and that the maximum permissible cumulative exposure times would not be reached in an 8-hour working day. However, this would only be applicable to the four LCUs used in this study under the same conditions. The authors advised that precautions should nonetheless be taken – wearing protective glasses and averting one's eyes. Remember, too, that cataract surgery and the use of photosensitising medications result in a greater susceptibility to retinal damage.

Comment (DB): Light curing machines have become more refined and the light they produce more intense, as manufacturers strive to create equipment that can keep up with the ever evolving needs of light sensitive materials within the dental industry. This study looked to assess the risk of ocular damage from four types of LCUs, measuring both blue light- and UV-mediated ocular damage at 30cm, 50cm and 100cm. While UV-mediated ocular damage was not found to be a significant risk, intense blue light from high-powered units showed the potential to cause ocular damage at short distances. The authors of this study recommended that dental professionals use protective eyewear when using light curing machines to minimise potential damage caused by cumulative exposure.

Reference: J Can Dent Assoc 2011;77:b116

http://www.jcda.ca/article/b116

Sex differences in pain

Author: Dao T

Summary: This paper on differences associated with pain between men and women noted that pain modulation via a variety of biological factors could be explained by distinct anatomical, physiological and hormonal features. The author concluded that such observations *"should help counteract prejudicial attitudes toward female patients, which can lead to inadequate care"*.

Comment (JL): It has been found that some pain disorders may have gender predilections while others appear to be age dependent. Several chronic pain disorders are more prevalent in women than in men, with many of these in the head and neck region such as TMJ disorders and headaches. Laboratory studies have concluded that females have greater pain sensitivity to laboratory pain than males, with a cyclical fluctuation observed in women not taking oral contraceptives. Besides the effect of hormones in pain mechanisms, it has also been suggested that women seek treatment more readily than men and are more aware of physical sensations as indicative of illness, while men perceive pain endurance as a measure of virility. In addition, sex differences do exist in the structural organisation of the nervous system. The organisation and function of the sympathetic nervous system and the neuroplasticity in the autonomic nervous system may explain the female predominance in chronic pain disorders. We should keep all of the above factors in mind before dismissing pain in our female patients as being of either psychosomatic or psychological origin – real differences do exist!

Comment (DB): I find it interesting that if a cause of pain cannot be found, it is often classified as psychosomatic or 'in the patient's head'. While this may seemingly excuse the physician for 'not having an answer', it does little to reassure the patient that their concerns are valid or help them find methods to manage their pain. This article provided an interesting insight as to why it may 'appear' that women are more likely to suffer unexplained pain (particularly in the head and neck region) than men. Anatomical, physiological and hormonal differences between men and women were identified in this paper as having an influence on pain modulation. Another important finding was that men are less likely to seek help for pain, therefore many men who may be suffering similar unexplained symptoms were unable to be accounted for. Women were identified as more likely to associate 'pain' as the body's signal to seek help than men, and men were more likely to 'tough it out' than women in order to appear more masculine.

Reference: J Am Dent Assoc 2012;143(7):764–5

http://jada.ada.org/content/143/7/764.full

Dental erosion in the 21st century: what is happening to nutritional habits and lifestyle in our society?

Authors: Gambon DL et al

Summary: This paper reported trends that have occurred within the last century that have contributed to the increased prevalence of dental erosion, including: i) increased preference for acidic foods and drinks as a result of greater exposure to sour tastes early in life; ii) greater prosperity leading to increased availability of acidic fruits and drinks; iii) the availability of new acidic candies (some of which stay in the mouth for prolonged periods); and iv) intense marketing and widespread availability (e.g. in schools) of acidic foods and drinks. The authors also noted the lack of attention that has been paid to less erosive foods and drinks with respect to development and marketing.

Comment (JL): The prevalence of dental erosion in young children and adolescents continues to increase. This paper discussed factors affecting nutritional habits and the lifestyle changes responsible for the increase in erosion, particularly in children. It has been found that consumption patterns and food and beverage preferences in early childhood can influence preferences later in life. Of interest is that boys need about 10% more sourness and 20% more sweetness than girls to recognise taste, and they prefer more extreme flavours. This taste preference relates to the greater consumption of both acidic foods and soft drinks, and may explain why erosion develops more rapidly in boys than girls. Acidic fruit and vegetables are now available all year, and several new acidic fruits have been introduced into our routine diets. The range and availability of lollies has also increased dramatically, with many containing organic acids. Not only are these lollies potentially erosive, many dissolve slowly decreasing the intra-oral pH for an extended period of time. Aggressive marketing targeted at children influences their intake of unhealthy and erosive foods and beverages. Parents should be made aware of potential damage to their children's dentition and advised to delay their children's exposure to sour tastes for as long as possible.

Comment (DB): The increase in availability of acidic drinks and the further addition of food acids to already cariogenic sweets and beverages to create a 'sour' taste has been identified in recent years as a major contributing factor to the rise in dental erosion. Children's taste buds, while traditionally tending towards sweet, are adapting to this high acid exposure, and a resulting preference for 'sour' over 'sweet' has been observed. Aggressive marketing strategies adopted by lucrative industries looking to make a profit have made such unhealthy erosive foods highly attractive to children. This paper highlights that children who are exposed to this 'sour' taste at a young age are more likely to consume large quantities of acidic food and beverages when they are older, and the authors recommend delaying contact with these products for as long as possible.

Reference: Br Dent J 2012;213(2):55–7

http://www.nature.com/bdj/journal/v213/n2/full/sj.bdj.2012.613.html

Child dental neglect: is it a neglected area in the UK?

Authors: Sarri G & Marcenes W

Summary: These authors sought to raise the profile of dental neglect among UK children as a public health concern. Firstly, they defined, and discussed the consequences of, dental neglect in children. They then went on to comment on the respective responsibilities of parents, professionals, government and society. The final section of their report proposed a holistic approach to addressing the problem in the UK.

Comment (JL): Dental neglect is defined as *"parents' failure to pursue the necessary dental treatment required to maintain the child's oral health and ensure their freedom from pain and infection"*. Unfortunately, many dental health professionals are reluctant to acknowledge this as neglect, even though the consequences of untreated dental diseases are many and varied. One of the difficulties regarding dental neglect is the issue of responsibility. While parents are often held solely responsible, environmental and socioeconomic factors undoubtedly play a role. Poverty, problems with access to dental services due to transportation issues, language and cultural barriers, and a lack of information are all contributing factors. Neglecting disease constitutes a human rights violation, and children need regular contact with dental health professionals. A supportive public health approach, national strategies to reduce barriers to care, making parents aware of their responsibilities and assessing why dental examinations or treatment is not carried out for some children are all approaches that can help protect these vulnerable members of our communities.

Comment (DB): The debate on whether untreated poor oral health of children is in fact neglect is a highly contentious and controversial issue. On the one hand, the authors' stated that given a publically funded NHS system is available in England, there is no excuse for failing to seek treatment for children with dental disease. The suffering of children due to this dental neglect has been labelled as cruel and unnecessary, and should be considered equal to medical neglect or failing to provide the necessities of life. However, they also highlighted the wider determinants of health that outline the barriers to good oral health, such as being unable to afford nutritious low cariogenic food or toothbrushes, as well as having difficulty attending appointments due to not being permitted time away from employment or not having a means of transport. The authors recommend a holistic approach to the issues, with suggestions ranging from developing a supportive public health approach aimed at reducing equity disparities to adopting a firm stance on individual accountability for cases where severe neglect can be determined.

Reference: Br Dent J 2012;213(3):103–4

http://www.nature.com/bdj/journal/v213/n3/full/sj.bdj.2012.668.html

Oral health inequalities in a national sample of Australian children aged 2–3 and 6–7 years

Authors: Kilpatrick NM et al

Summary: These researchers explored the associations between reported oral health and four indicators of social disadvantage (socioeconomic position, residential remoteness, indigenous status and non-English speaking background) in cohorts of Australian children aged 2–3 years and 6–7 years. Associations were seen between both lower socioeconomic position and indigenous status and poor oral health on all three indicators in both cohorts. Increased caries were associated with: i) less accessible location in both cohorts; ii) non-English speaking background in the 2–3-year old cohort; and iii) dental service nonuse in the 6–7-year old cohort. The 6–7-year old cohort also had larger inequalities for socioeconomic position and toothbrushing.

Comment (JL): Unfortunately, good oral health in childhood is not enjoyed equally. The most recent Australian Child Dental Health Survey confirmed this unfortunate truth. This paper used cross-sectional data from the Longitudinal Study of Australian Children to explore the associations between oral health and indicators of social disadvantage in children aged 2–3 and 6–7 years. Socioeconomic position was based on combined annual household income, parents' years of education and occupation. The other indicators of social disadvantage in Australia were residential remoteness, indigenous status and non-English speaking background. It was shown that less than half of children aged 2–3 years had their teeth brushed twice daily, the most disadvantaged 6–7-year old children had 3.40 times the odds of infrequent toothbrushing compared with the least disadvantaged group, and indigenous children had a 1.5- to 2-fold increased odds of caries experience, infrequent toothbrushing and nonuse of dental services. These are disturbing statistics demonstrating significant social disparities in oral health outcomes that can persist into adulthood. How would NZ compare?

Comment (DB): This cross-sectional study obtained information from the Longitudinal Study of Australian Children with the aim of identifying associations between social disadvantage and poor oral health. Previous studies have shown a statistically significant link; however, there is limited information looking specifically at very young children that also includes a variety of social disadvantage indicators. The results showed that by age 2–3 years, less than half of the children had their teeth brushed for them twice daily and only 15% had attended a dental visit in the previous 12 months. Given this lack of dental examination, it is therefore understandable why caries activity reported by parents was only at 3%. To get a true indication of caries activity, a comprehensive examination would need to be conducted by an oral health professional. This study concluded that social disadvantage resulted in significant disparities in oral health status for children as young as 2 years of age; therefore, interventions should be started as early as possible.

Reference: Aust Dent J 2012;57(1):38–44

http://tinyurl.com/ADJ-57-38

The avoidance and delaying of dental visits in Australia

Authors: Australian Research Centre for Population Oral Health

Summary: Self-reported information on avoiding or delaying dental visits from 1083 Australian adult survey respondents (response rate 71.7%) was presented. It was found that 67.1% reported avoidance of attending dental appointments or attended less often than they felt they needed to. Cost/expense was the main reason given (67.6%) followed by 'not getting around to it' (31.9%), lack of time (30.3%), 'not liking the dentist' (18.1%), fear/anxiety (17.8%) and inconvenience (8.5%). More than one reason for nonattendance was provided by over half the respondents. The authors indicated that *"numerous barriers, real or perceived, need to be overcome in order to meet existing unmet needs"*.

Comment (JL): Of the 1083 Australian adults who participated in this questionnaire study, over two-thirds avoided going to the dentist or went less often than they felt they needed to. It has been found that approximately 16% of Australian adults suffer from high dental fear, but this is obviously not the only factor keeping them away. The results of the study showed that for over 67% of those who avoided the dentist, the major reason was cost or expense, followed by lack of time and 'not getting around to it'. Not liking the dentist, dental anxiety and fear, and inconvenience were less commonly cited reasons. Although their major reasons were different, males and females did not differ in their frequency of dental avoidance. Of interest was that adverse dental experiences were not associated with avoided or delayed dental visits. This article highlights the fact that reasons behind avoidance are multifactorial. Being aware of a patient's barriers to care may assist us in helping our patients overcome these (real or perceived) barriers.

Comment (DB): This study aimed to investigate the reasons why some Australian adults avoid visiting a dental professional. There is strong evidence identifying cost and dental anxiety as predominant inhibiting factors for many; however, less information is available that looks into other reasons why people may avoid dental visits. Self-completed questionnaires were posted out to a random sample of participants in the 2008 National Dental Telephone Interview Survey and, as predicted, of these 67.6% cited cost as the inhibiting factor. Interestingly, the next cited reason was lack of time, followed by dental anxiety and not liking the dentist. Given that Australia, like NZ, has a predominately private dental health system for adults, it is not surprising that this has created an inequitable situation whereby dental care is only available to those who can afford it. Now that this has been overwhelmingly identified, what is the next course of action?

Reference: Aust Dent J 2012;57(2):243–7

http://onlinelibrary.wiley.com/doi/10.1111/j.1834-7819.2012.01697.x/abstract

Physical child abuse: perception, diagnosis, and management by southern Brazilian pediatric dentists

Authors: El Sarraf MC et al

Summary: This analysis of survey data from 212 paediatric dentists in Brazil (response rate 33%) found that those who had graduated >18 years beforehand were less likely to report cases of suspected child abuse than their counterparts who had graduated more recently. Just over half of respondents (55%) believed they would be able to identify child abuse cases and 36% thought they would be unable. Only 48% of respondents indicated that they would report suspected cases to the relevant authorities, despite 73% knowing it was compulsory to do so. Similarly, only ~12% had reported suspected cases of abuse even though 36% indicated they had seen such cases. The most frequently reported signs of abuse were haematoma throughout the body (61%) and behavioural changes (53%), while lesions on the face, mouth and teeth were reported by only 17% of respondents.

Comment (JL): It has been estimated by the WHO that authorities are notified of only 1 in 20 cases of violence against children. The lesions associated with physical aggression can present as cuts, burns, lacerations, bruises, contusions, abrasions or haematomas, with approximately 50–67% of these injuries occurring to the head, neck, face and mouth – areas readily visible to a dentist or dental therapist. This Brazilian study highlighted the lack of information on identifying and reporting child abuse during undergraduate studies – a finding similar to that in a previous Danish study. If our formal training was lacking or we no longer recall the information, re-educating ourselves is necessary. Besides the aforementioned clinical signs of abuse, we must be aware of other signs such as inappropriate dress in relation to the weather and changes in mood or behaviour that could be apparent in a regular patient. Knowledge of the correct legal procedures is also essential so that solutions can be sought and the health and safety of children maintained.

Comment (DB): This study obtained data via a postal survey to paediatric dentists in Brazil on the diagnosis and subsequent reporting of suspected child abuse cases they encountered. The response rate to the survey was 33%, and the results showed a lack of confidence by many specialists in accurately recognising abuse and a further reluctance to report their suspicions to the appropriate authorities. The authors of this paper cited the number of reported 'suspected' cases of child abuse received in Brazil per annum; however, there were no statistics to follow up the accuracy of these suspicions. There is always a fear that a diagnosis may be incorrect, thereby creating unnecessary pain, anxiety and disruption for a family who has done nothing wrong. Further fears were highlighted that if a diagnosis were correct, there would be repercussions for the child from the abuser. This study highlights the need for further education and support for dental professionals who have frequent contact with children who may be victims of abuse.

Reference: Pediatr Dent 2012;34(4):72E–6

http://www.ingentaconnect.com/content/aapd/pd/2012/00000034/00000004/art00009

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Management of delayed eruption of permanent maxillary incisor associated with the presence of supernumerary teeth

Authors: Manuja N et al

Summary: This was a case of a 9-year-old boy who presented with radiographic findings of an unerupted left maxillary permanent central incisor with immature root and two supernumerary teeth, one of which had erupted while the other impacted inverted mesiodens. The surgical management under local anaesthesia, including removal of the supernumerary teeth, was described. Six months later, eruption of a permanent left maxillary central incisor was seen.

Comment (JL): This case report provides a good overview of supernumerary teeth. The presence of supernumerary teeth in the anterior maxilla is the most common cause of delayed eruption of the permanent maxillary incisors. Supernumerary teeth in the permanent dentition occur in 1–3% of the general population, are twice as common in males than females, and approximately 90% are found in the maxilla. While their aetiology remains unknown, they are often part of developmental disorders and syndromes. Classification is according to either the position or morphology of the supernumerary tooth. The mesiodens, found in the maxillary midline, has a prevalence of 0.15–1.9%. Clinical complications include delayed eruption, rotation or displacement of the permanent incisor, midline diastema, resorption of adjacent teeth, root anomalies and cyst formation. This paper provides us with a good overview and a reminder that careful monitoring of eruption of the permanent incisors is essential. Abnormalities in sequence or timing require referral to a dentist, as removal of the supernumerary at an appropriate time can promote self-eruption of the incisor and minimise the need for orthodontic treatment.

Comment (DB): This case report followed the diagnosis, treatment and postoperative follow-up of a 9-year-old boy with two supernumeraries in the maxilla at the midline. The mesiodens were inhibiting the eruption of the 21, which had an immature root. Discussion points around timing of the removal of the mesiodens were presented, with potential complications arising from both early and delayed treatment. The risks included potential damage and devitalisation of adjacent teeth with early extractions, and loss of spontaneous eruption potential of unerupted teeth if treatment was delayed. In this case, the decision was made to surgically remove the supernumeraries early, and at 6 months postsurgery, the 21 was erupting well. A future orthodontic assessment was recommended.

Reference: Int J Clin Ped Dent 2011;4(3):255–9

http://www.jaypeejournals.com/eJournals/ShowText.aspx?ID=2243&Type=FREE&TYP=TOP&IN=~/eJournals/images/JPLOGO.gif&IID=187&isPDF=YES

Emotional contagion of dental fear to children: the fathers' mediating role in parental transfer of fear

Authors: Lara A et al

Summary: These researchers distributed a questionnaire to 183 schoolchildren and their parents in Spain to examine transference of fear associated with dental visits from the parents to their children. They found a significant correlation between family members' levels of dental fear, and that the relationship between mothers' and children's fear scores was mediated by the fathers' dental fear.

Comment (JL): Dealing with anxious/fearful children is certainly not an unusual experience for anyone who treats children. Although mild fear/anxiety is consistent with normal development, it can cause problems with avoidance, cancellations and treatment refusal. The aim of this study was to analyse the possible emotional transfer of dental fear among family members and help determine its transmission mechanisms. Although previous studies have focused on maternal fear, the authors separately analysed the levels of dental fear for both parents, as they felt that fathers would play a different role to mothers. Their findings were that the father's dental fear does indeed play a role in the level of dental fear of the child. Of interest is that when the levels of fear of mothers and fathers were jointly included in a regression model, only the father's dental fear remained as a significant predictor of the child's fear. Does this remain stable at different ages? Would an intervention aimed at reducing the father's dental fear levels decrease the dental fear experienced by the child? More research is needed.

Comment (DB): The transmission of fear from parent to child has been well documented, and most dental professionals can recall stories of adults enthusiastically reciting memoirs of 'what happened to me' and how 'I hated the dentist' in front of their impressionable children anxiously awaiting their first filling. While this study has shown results consistent with findings from other studies, the results are limited due to the study design and low number of participants experiencing dental anxiety. Previous dental experiences, socioeconomic status and education are but a few issues that may have confounded the findings, and selecting children from two similar schools limits the generalisability and reliability of the results. I was interested to see a statistically significant relationship between the father's role over the mother's in transferring fear; however, as stated, this finding may have been confounded, so further studies looking into this would be interesting.

Reference: Int J Paediatr Dent 2012;22(5):324–30

http://onlinelibrary.wiley.com/doi/10.1111/j.1365-263X.2011.01200.x/abstract

Impacted canines: our clinical experience

Authors: Chawla S et al

Summary: These authors from India reported on their experiences of 43 impacted canines (in 33 patients) treated over a 3-year period. They found that canine impactions were statistically more frequent in the maxilla than the mandible, with most maxillary and mandibular impactions positioned palatally and labially, respectively; a significant association was seen between arch and position (p=0.002). The impacted canines were treated with surgical exposure and orthodontic repositioning, cyst enucleation with extraction and surgical removal.

Comment (JL): Apart from third molars, eruption disturbances are more common in canines than in the other teeth, with 5.6–18.8% of the population having impacted canines. The authors of this paper offered us some practical points. Clinical elements suggestive of the occurrence and location of impacted canines include an over-retained deciduous canine, insufficient space, tipping of the lateral incisor as a result of pressure of the canine at its root, and palpation of the canine. Radiological examinations are, of course, indispensable in diagnosis and location of position. Intraoral PAs, orthopantomography, occlusal and paranasal sinus views, and computed tomography are all being used. The authors found a strong association between arch and position, with impacted canines mostly palatal in the maxilla and labial in the mandible. This finding is consistent with the literature. Treatment options include no treatment with periodic observation, surgical exposure and orthodontic repositioning, surgical relocation and surgical removal. The patient's age, dental status, any associated conditions and arch length are all considerations when deciding on the mode of treatment. It is essential that we identify this problem and refer for treatment to avoid potential problems such as cysts, tumours or resorption of the impacted tooth or adjacent teeth.

Comment (DB): The authors of this paper studied the data of 33 cases with impacted canines and discussed the various diagnostic and treatment methods used. Many studies have identified that impacted canines are more common in the maxilla than the mandible, and the results of this study were consistent with those findings. Interestingly, it was found that in the maxilla, the canine is more likely to be sitting palatally, whereas in the mandible a labial position is more common. Surgical exposure of the canine with subsequent orthodontist repositioning was found to be the most common treatment of choice, and in cases where this was not appropriate, surgical extraction was indicated to prevent future problems.

Reference: Int J Clin Ped Dent 2011;4(3):207–12

http://tinyurl.com/IJCPD-4-207

Independent commentary by Jonathan Leichter DMD, Cert Perio (Harvard).
For full bio CLICK HERE.

Independent commentary also by Deanna Beckett, Professional Practice Fellow with the Bachelor of Oral Health programme at the School of Dentistry, University of Otago.