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Why has oral health promotion and prevention failed children requiring general anaesthesia for dental extractions?

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Objectives: Many children in the UK still require dental treatment under general anaesthesia (DGA). Why oral health promotion and prevention, in this cohort of children, has failed is poorly understood. By questioning the parents/carers of children undergoing DGA this study aimed to establish: 1 previous exposure to oral health education and promotion activities; 2 beliefs and behaviours about dental caries and prevention; and 3 what parents perceive useful in preventing dental caries. ***Basic research design:*** A cross-sectional questionnaire based study. ***Clinical setting:*** Dental general anaesthetic centres in Wales, UK. ***Participants:*** 207 consecutively attending parents of children aged <10 years requiring a DGA**.** ***Results:*** In total, 150 (76%) parents/carers claimed to have received previous oral health advice and 103 (52%) had received toothbrushing instruction from a dentist. Only 18 (9%) reported the application of topical fluoride. Sixty seven (34%) believed "tooth decay runs in families" and 53 (27%) it was simply bad luck that their child had dental decay. The majority (89%) believed that information leaflets on oral health would be useful and 133 (67%) would find information on a website helpful. ***Conclusions:*** This study suggests that there is a significant scope for increasing the exposure of high risk children to fluoride. A sense of fatalism and erroneous beliefs were evident amongst some parents/carers of children needing DGA. These issues need to be addressed in the future design of oral health promotion/prevention activities.

Key words*: dental general anaesthesia, fluoride, oral health advice, oral health promotion, prevention*

Introduction

Despite overall improvements in oral health over the last three decades, dental caries remains a significant source of morbidity in children in the United Kingdom (Pitts *et. al*., 2006). The association of the disease with social and economic deprivation is well recognised (Jones *et. al.* 1997; Prendergast *et. al.,* 1997; Sweeney *et. al.,* 1999; Tickle *et. al.,* 2000a,b). Acknowledging the common risk factors of dental caries and other lifestyle related chronic diseases, Sheiham and Watt (2000) have highlighted the need for a 'common risk-factor approach' to the prevention of dental caries.

In the past, dental prevention has relied heavily on one-to-one health education, an approach shown to have limited benefits and only effective when delivered in conjunction with a fluoride vehicle (Kay and Locker, 1997). Addressing the oral health beliefs and practices of the parents and carers (hereafter simply parents) of those children at greatest risk of disease has proven an intractable challenge. The consequence of dental decay in young children is frequently referral for tooth extraction under a dental general anaesthetic (DGA). It is estimated that in Wales alone, around 10,000 general anaesthetics are administered annually (National Public Health Service, 2006). This represents a failure in dental prevention. There is a lack of understanding of why oral health education/promotion activities fail those children who undergo DGA.

A better understanding of previous exposure to oral health education and prevention of the parents of children requiring DGA might be of value to those responsible for commissioning and delivering dental care. In this way resources could be more effectively targeted to those at greatest risk.

The aims of the current study were, therefore, in a cohort of parents and carers whose children were referred for tooth extraction under general anaesthetic to examine:

a, Previous exposure to oral health education and promotion activities;
b, Beliefs and behaviours about dental caries and prevention; and,
c, What parents/carers perceive useful in preventing decay.

Methods and Materials

The survey participants comprised consecutively attending parents of children aged under 10 years requiring a DGA. Informed written consent to participation in the survey was obtained from the parents. Those unable to speak English were excluded. The questionnaire was administered at all 3 sites where DGA are administered for children living in Cardiff city and adjacent valley communities. These sites receive referrals from both primary and secondary care practitioners.

A literature search ascertained that no validated questionnaire regarding this research issue was available so closed questions were generated de-novo to address the survey objectives. Data were collected via a 24 item questionnaire organised in 4 principle domains: 1, Previous exposure to oral health education and promotion

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activities in dental and in non-dental settings; 2, Beliefs about dental caries and prevention; 3, Preferred formats for the future delivery of oral health education; and, 4, Demographics. To check on ease of administration, the questionnaire was pre-tested in 5 volunteer parents. The questionnaire was administered between May and July 2008, before DGA and face-to-face by one of the authors (AK), who recorded participant responses.

The study was reviewed by the local research ethics committee who confirmed that it did not raise significant ethical concerns.

Townsend Material Deprivation Scores (Townsend *et. al*. 1988) were calculated for the electoral ward of residence from the postcodes supplied by the survey participants. Frequency analyses were carried out to describe respondent demographics and other variable characteristics using SPSS version 14.

Results

In total 207 parents were invited to participate in the survey. Of these 198 (96%) consented and were interviewed. The sample comprised 168 (85%) mothers, 27 (14%) fathers and 3 (2%) carers. All approached spoke sufficient English to be included in this study so none were excluded because of inadequate English. The mean age of the survey respondents was 34 years (median 34, range 20-62) and their children requiring DGA had a mean age of 6.5 years (median 6, range 2.3-9.9). Over two thirds of those questioned resided in areas classified as being in the two most deprived quintiles: values for the quintiles were 42, 26, 17, 7 and 9%.

In total, 130 (67%) of the parents reported that their child visited a dentist regularly and at least annually. Respondents were asked if a dentist outside the hospital where the DGA was being carried out had ever offered oral health education/prevention activities. Study participants were specifically asked about advice on toothbrushing, fluoride use and the application of fissure sealants. The frequency with which parents (n=198) claimed a dentist had discussed or provided prevention or advice was oral health advice 76%, brushing instructions 52%, and advice to spit but not to rinse after brushing 29%. Just 18 (9% though another 12% were not sure) and 15 (8%) respectively claimed to have had topical fluoride applied or been prescribed fluoride tablets, drops or mouthwashes. Of the 80 7-10 year olds, 14% had had fissure sealants applied.

The parents were also asked what oral health education/preventive advice they had received in a non-dental setting. Of the 198 participants, 89 (45%) recalled receiving dietary advice relating to general health and of these, 66 (74%) reported this included specific oral health information.

Just over half (104) of the participants had received a free toothpaste or a toothbrush for their child and 77 (39%) of the children had participated in toothbrushing programme in a school or nursery. Around a third had received leaflets on oral health and oral health advice at a post-natal baby clinic and of those 91% said they had read it (Table 1). Of the 168 mothers participating in the survey, 31 (19%) had received oral health advice prenatally.

In the next section of the questionnaire, parents were asked if they agreed with 6 statements relating to dental caries. While 137 (69%) agreed tooth decay is a serious health problem, the remainder were either unsure or disagreed this to be the case. Further, one in three believed tooth decay runs in families, and a quarter felt it was just bad luck that their child experienced dental decay. Almost all disagreed that after DGA their child only needed to see a dentist when a problem arose with their teeth. In addition, 27% considered a child's tooth decay was just bad luck, 25% thought it was cruel not to give children sweets, and 11% thought it was cruel to allow children only milk or water to drink between meals.

When asked about future preventive behaviours, 104 (54%) parents said they will find it difficult to say 'No' to their child when they ask for foods or drinks that are harmful to teeth. In addition, 48 (24%) admitted that they will find it difficult to make their child brush his/her teeth while 26 (13%) thought that taking their child to the dentist regularly would be problematic.

Finally, inquiry was made as to the perceived usefulness of different media for the provision of oral health information. A positive response was recorded for the majority of the study participants in relation to the media discussed. Leaflets were perceived as useful by 177 (89%) participants and 133 (67%) agreed that an Internet website would also be of value. Inquiry also revealed that 52 (26%) of the participants had searched the Internet for information on general health, although only 15 (8%) said that they had used it to look for information on oral health.

Table 1. Past oral health prevention advice or intervention received by children/parents outside dental practice

Oral health prevention/advice	*Yes, %*	*No, %*	*Not sure, %*	*n*
Parents/carers had received diet advice on their child's general health from a doctor or health visitor or midwife or dietician?	45	55	1	198
- of which the advice specific to oral health was included	74	23	3	89
The child had received a free toothbrush or toothpaste	53	46	2	198
The child had participated in a toothbrushing programme in a school/nursery	39	54	7	198
Parents had attended baby clinics after the birth of their child	91	8	1	198
- of which had received oral health advice in baby clinics	35	54	11	181
Parents/carers had received leaflets on oral health	34	64	2	198
- of which claimed that they read that oral health leaflet	91	6	3	68
During pregnancy, mothers had received oral health advice on the child's teeth	19	78	4	168

Discussion

This study gives a 'snap-shot' of exposure of one district's parents and their children requiring DGA to oral health prevention and parental beliefs about dental decay. Due to the limitations of this study design, the results of this study may not be generalisable to other populations.

The administration of the questionnaire just prior to the DGA, although pragmatic, was not ideal as the parents may have felt anxious and given responses which they thought were more acceptable. The survey also did not collect data on the children who failed to attend DGA. It is likely that their parents could have responded differently to participants.

The average age of children and their parents is similar to other studies of DGA recipients in Wales (Clewett and Treasure, 2004). The long established relationship between deprivation and dental caries (Jones *et. al.,* 1997; Prendergast *et. al.,* 1997; Sweeney *et. al.,* 1999; Tickle *et. al.,* 2000a,b) is reflected in this study population, the majority of whom were in the two quintiles of greatest deprivation (Townsend *et. al*. 1988).

It is interesting that most of the parents claimed that their dentist had provided oral health advice and toothbrushing instructions relating to their child. It should be noted that this study did not explore whether the dentists provided oral health advice and toothbrushing instructions prior to or in response to occurrence of dental caries. Nevertheless, the dentists should be providing more topical fluoride and fissure sealants rather than relying on oral health advice to prevent dental decay in children. A national diet and nutrition survey on children and adolescents reported that provision of advice on teeth cleaning and diet had little effect on caries experience (Walker *et. al.* 2000). Similarly, a systematic review by Kay and Locker (1997) concluded that in the absence of fluoride, evidence for the effectiveness of educative programmes in caries reduction was lacking.

Considering dental surgery-based prevention, very few children in this study had topical fluoride applied or prescribed by their dentists or had received fissure sealants on their permanent teeth. However, reliability of the information obtained from the parents is questionable. A number of factors need to be considered such as recall bias, parental ability to comprehend treatment provided to a child and level of explanation provided by the dentists. Investigation of patient records held at referring practices to check the accuracy of the information provided by the parents was beyond the scope of this study.

Studies have shown that topical fluorides and fissure sealants are effective in preventing dental decay (Ahovuo-Saloranta *et. al*. 2004; Marinho *et. al*. 2003). Low use of fissure sealants and topical fluoride by dentists may be due to the lack of a financial incentive for such preventive treatments. In the absence of water fluoridation in Wales, initiatives to ensure the delivery of practice-based fluoride containing preventive programmes are required.

In recent times, health authorities have recognised the potential for oral health promoting activities outwith the confines of a dental surgery and a number of community based toothbrushing schemes have been established via programmes such as 'Sure/Flying Start' and in schools. The reported level of exposure of children and their parents' to oral health promotion and prevention such as supervised toothbrushing in schools and nurseries and distribution of free toothpaste or toothbrush was encouraging. These methods can be very useful way of bringing children's teeth into contact with fluoride to prevent caries. This study did not explore the duration of fluoride exposure of these children via these programmes. For example, although just over a half of the participants reported receiving a free toothpaste or toothbrush for their child, many of them could have received them just once as a part of an incentive pack in postnatal baby clinics. A fluoride supplementation programme needs to be of sufficient duration to benefit participating children.

Insight into oral health beliefs of parents is useful in designing oral health education materials/programmes. Almost a quarter of the parents thought it cruel to deny their children sweets and accepted dental decay as bad luck. This could reflect a lack of awareness or fatalistic beliefs. It should be noted that oral health education is effective in improving knowledge levels but there is no evidence that such change in knowledge leads to changes in behaviour (Kay and Locker, 1997). Nevertheless, oral health education which addresses the parental misconceptions and misinformation should be a part of a fluoride-based preventive programme. More research is required to explore why many parents, despite receiving oral health advice, hold erroneous dental beliefs and have not modified oral health behaviours. A qualitative study using focus groups may be more appropriate to obtain this information.

The majority of the parents tended to agree with the suggested media for dissemination of oral health information/education. It was interesting to note that two thirds of the participants said that an Internet website with information on oral health would be useful when only 8% had ever used such to find information on dental health. It is possible that the participants either gave a socially desirable answer or intended to use the Internet for information in future. Similar levels of the Internet use by adults attending a periodontal clinic in Wales were reported by Harris and Chestnutt (2005).

Almost all parents reported that a toothbrushing programme in schools would be helpful to their children. 'Designed to Smile' (Welsh Assembly Government, 2008), funded by Welsh Assembly Government and currently being piloted in Cardiff and North Wales, aims to improve the oral health of children in the most deprived areas by delivering supplemental fluoride through supervised toothbrushing and fluoride varnish. School-based toothbrushing programmes may be a useful mechanism to target high-risk children who would otherwise not routinely get exposed to toothbrushing with a fluoride containing paste. Such programmes should, however, be seen as an adjunct to a home-based oral hygiene regime and other health conducive behaviours.

Conclusions

The majority of the participants reported having received oral health advice but fluoride applied or prescribed by the dentists was lacking. Erroneous beliefs were prevalent among some parents/carers of children requiring DGA for extractions. Further work is required to identify how

these children can be specifically targeted to increase their exposure to fluoride and how to provide appropriate education and advice.

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Errata notice

- The final letter, k, was omitted from the correspondence email address, v.ravaghi@qmul.ac.uk, in Ravaghi *et al*. (2011): Comparison of the COHIP and OHIP- 14 as measures of the oral health-related quality of life of adolescents. *Community Dental Health* **28**, 82-88.
- On the spine of the last issue, volume 28, issue number 3, pages 189-252, the issue number and page range were stated incorrectly.
- The editorial in that issue (Schulte, A.G. (2011): Position papers by EADPH Special Interest Groups. *Community Dental Health* **28**, 190) gave a reference which named the first author incorrectly. The correct version is: Leroy, R., Eaton, K.A. and Savage, A. (2010): Methodological issues in epidemiological studies of periodontitis – how can it be improved? *BMC Oral Health* **10**, 8.

Apologies for any inconvenience caused by the above errors.