Community Dental Health (2009) **26,** 52–57
Received 10 October 2005; Accepted 2 March 2007

doi:10.1922/CDH_2150Milsom06

Dental general anaesthesia - will the service disappear? A pilot study

Y.M. Dailey[1], S.R.W. Bricker[2], D. Edwards[3] and K.M. Milsom[4]

[1]Acting Consultant Dental Public Health, NHS Western Cheshire, 1829 Building, Countess of Chester, Liverpool Road, Chester. [2]Consultant Anaesthetist, the Countess of Chester Hospital, Chester. [3]Deputy Director of Public Health, Halton and St Helens NHS Primary Care Trust, Victoria House, Holloway, Runcorn. [4]Consultant in Dental Public Health, Halton and St Helens NHS Primary Care Trust, Victoria House, Holloway, Runcorn.

Objectives: To identify likely future trends in recruitment of consultant anaesthetists to the ambulatory dental general anaesthetic (DGA) services. ***Participants***: The sample consisted of all anaesthetic specialist registrars (SpRs) in their final year of training, within Mersey and South-Western Deaneries in the UK. ***Research Design***: A questionnaire divided into a quantitative section to establish level of training in ambulatory DGA, and a qualitative section designed to elicit opinions and attitudes towards ambulatory DGA services. ***Results***: The response rate was 75% (27/36). Within both regions 81% (22/27) had received practical training in ambulatory DGA procedures. SpRs in the South-Western Deanery held the greatest misgivings about the ambulatory DGA technique. Once appointed to Consultant position only 11% (3/27) of respondents expressed a definite interest in providing ambulatory DGA services. ***Conclusions****:* Within the Northwest and Southwest of England, most specialist registrars in anaesthetics receive training in ambulatory DGA, although their future commitment to the delivery of these services is questionable.

Key Words: Dental epidemiology, general anaesthetics, primary dental care.

Introduction

The current National Children's Dental Health Survey (Pitts and Harker, 2004), reported a sustained improvement in the dental health of the permanent teeth among older children. However, this was not the case for the primary dentition of younger children. Over the last decade there has been no significant change in the proportion of five- year olds with decay in the primary dentition, (Pitts and Harker, 2004). Moreover, the general patterns of child dental health improvement are not the same across the United Kingdom- inequalities still exist. Five- year old children in the North-West of England have on average twice as much tooth decay as children in the South-West of the country (Pitts *et al*., 2003).

For many years in the UK, ambulatory dental general anaesthesia (provision of general anaesthesia in a dental chair, and where the patient has the ability to walk in and out from the procedure) for the extraction of decayed teeth in young children was an accepted form of treatment. Arrangements for the delivery of this service were dealt with at the local level, and in the main, consultant anaesthetists would attend local dental practices or community dental clinics, where the necessary treatment was delivered. This time honoured arrangement provided the families of children in need of urgent dental care with an accessible and responsive dental service. The local nature of the service meant that parents, often from disadvantaged backgrounds, did not have to travel long distances in order to secure effective treatment for children with dental pain. The arrangements also proved to be satisfactory for anaesthetists who were often able to leave their base hospital for short periods during the day in order to deliver the service in the community.

In the early 1990's, concern about safety and the quality of the facilities for community based ambulatory dental general anaesthesia (DGA) led to the publication of the Poswillo report (1990), which introduced stringent requirements for those providing the service. The main impact of the Poswillo Report was felt in general dental practice, where very quickly, ambulatory dental general anaesthetic services were stopped (Murray, 1993). Possibly because of the popularity of this type of treatment, there was no parallel reduction in this type of care within the Community Dental Service, which saw referral numbers for ambulatory DGA rise, as high street dentists sought to meet continued demand from parents of children in need of dental extractions (Clinical Standards Advisory Group,1995).

In the late 1990s, the pressure to withdraw ambulatory DGA grew. In 1998, dentists were directed by the General Dental Council to refrain from using ambulatory DGA in the community setting and to adopt "alternative methods of pain control" (General Dental Council, 1998). In 2000, a report published jointly by the Chief Medical and Dental Officers of England and Wales (Donaldson and Wild., 2000) stated that "*general anaesthesia for dental treatment should only be provided in hospitals which had immediate access to critical care facilities"*. This development effectively brought to a close the delivery of ambulatory DGA services within the primary care setting and those Community Dental Services that

Correspondence to: Dr Keith Milsom, Dental Public Health, St Helens and Halton PCT, Victoria House, Holloway, Runcorn, WA7 4TH.
E-mail:Keith.Milsom@hsthpct.nhs.uk

wished to continue to offer the service were forced to either find appropriate accommodation on a hospital site or withdraw the service. A large number of providers of service chose the latter option.

Prior to the changes in the regulations concerning ambulatory DGA, training opportunities for anaesthetists in this specialised aspect of their work were plentiful, and whilst ambulatory DGA was not a compulsory part of anaesthetic specialist registrar training, nevertheless many trainee anaesthetists chose to gain experience in this field. It was these trainee anaesthetists who were expected, as future consultants, to continue the delivery of the dental general anaesthetic and sedation services within the community setting.

By removing the primary care element from the delivery of ambulatory dental general anaesthetics, and citing the activity within the secondary care setting, there is a risk that anaesthetists may begin to view this type of work as simply more 'routine' hospital service which has to be accommodated within an already heavy workload. Furthermore, the implementation of the new consultant contract may also prompt anaesthetists into taking a critical approach to the nature of the NHS clinical workload they accept. These pressures may lead to fewer consultant anaesthetists undertaking ambulatory DGA and fewer specialist registrars undertaking training in this specialist area. If there is the possibility of a decline in the availability of suitably trained and experienced anaesthetists, is this likely to have a negative impact on the level of ambulatory DGA service that can be offered in the hospital setting? Additionally, will community based, anaesthetic led dental sedation services be placed at risk as anaesthetists have less time and opportunity to work outside the hospital environment?

In an attempt to identify likely future trends in recruitment of consultant anaesthetists to the ambulatory DGA service, a study was undertaken to identify the numbers of specialist registrars in anaesthetics in two regions of the country that received training in the delivery of ambulatory DGA and conscious sedation for dental procedures. The study also examined the views held by anaesthetic specialist registrars about ambulatory DGA.

In order to identify if the level of dental disease in the child population was a factor in determining the likely commitment of trainee anaesthetists to the ambulatory DGA service, two contrasting regions of the UK were selected for the study, one with a generally good level of child dental health (South-West of England) and the other with relatively high levels of child dental decay (Merseyside, North-West of England).

Methodology

Approval was obtained from the regional anaesthetic training advisors, to undertake the study with anaesthetic specialist registrars (SpRs) who were in their final year of training. The study used a self-administered postal questionnaire to anaesthetic SpRs in their final year of training within the Mersey and South West Deanery training schemes.

The questionnaire was in two parts.

1 *A quantitative section to establish the level of training in ambulatory dental general anaesthesia and the SpRs' future intentions towards providing an ambulatory DGA service*
2 *A qualitative section designed to elicit SpRs' opinions and attitudes towards ambulatory DGA*

To confirm interpretation and validity, the questionnaire was piloted with SpRs in the Manchester Deanery training scheme.

Two methods were used to mail the questionnaire; in the South-West they were distributed to SpRs by the postgraduate deanery, whilst in Mersey they were distributed directly by one of the researchers (SB). The main mailing was conducted in September 2003. Each specialist registrar was sent a copy of the questionnaire with a covering letter explaining the purpose of the study. An assurance was given that the data would be anonymised. A stamped addressed reply envelope was also included. To establish a maximum response rate six weeks after the initial distribution, all SpRs were sent a further copy of the questionnaire, together with a reply paid envelope.

Data Analysis

The quantitative data were analysed using SPSS (SPSS, 1998). The qualitative data were analysed for specific words or patterns, this process being continued until categories of similar themes were established.

Results

A total of 36 questionnaires were mailed. Twenty were returned on the first mailing and a further seven on the second mailing; thus, giving an overall response rate of 75% (27/36). The response rate for the South West was 71% (15/21) and for Mersey 80% (12/15).

Quantitative data

The number of SpRs who had received some training in ambulatory DGA, is shown in Table 1. Within both regions 81% (22/27) had received practical training in the procedure. There was no significant difference between the number of SpRs receiving ambulatory DGA training in both regions (Chi^2 1.48, df 1, p=0.223).

SpRs were asked to state if they had received training in conscious sedation for dental procedures and the results are shown in Table 2. For adult patients, 56% (15/27) of SpRs reported having received training in conscious sedation, and for child patients 30% (8/27) had received conscious sedation training.

Table 3 sets out the level of interest that SpRs expressed for delivering ambulatory dental general anaesthesia once they had a substantive post in anaesthesia and gives an indication of likely availability of service. Once appointed to a consultant position over half (14/27, 52%) of the respondents reported "some interest" in providing an ambulatory DGA service. However, only three respondents (3/27, 11%) expressed a definite interest in providing the service, and over a quarter (10/27, 27%)

Table 1. Number (%) of Anaesthetic SpRs training in ambulatory dental general anaesthesia

	AREA		
Type of training	*Mersey* *n (%)*	*South-West* *n (%)*	*All types of training* *n (%)*
No training	1 (8%)	4 (27%)	5 (18.5%)
Formal training	11 (92%)	11 (73%)	22 (81.5%)
Total	12 (100%)	15 (100%)	27 (100%)

Chi squared test for differences in Mersey and the South West dental general anaesthetic training (Chi^2 1.48, df 1, p=0.223)

Table 2. Number of Anaesthetic SpRs receiving training in conscious sedation for dental procedures in adults and children by region

		AREA		
	Training	*Mersey*	*South-west*	*Both Areas*
Adult conscious sedation	No training	4 (33%)	8 (53%)	12 (44%)
	Formal training	8 (67%)	7 (47%)	15 (56%)
	Total	12 (100%)	15 (100%)	27 (100%)
Child conscious sedation	No training	8 (67%)	11 (73%)	19 (70%)
	Formal training	4 (33%)	4 (27%)	8 (30%)
	Total	12 (100%)	15 (100%)	27 (100%)

Table 3. Expressed interest by SpRs to continue with ambulatory dental general anaesthesia when in substantive post

	AREA		
Level of interest	*Mersey* *n (%)*	*South West* *n (%)*	*Both Areas* *n (%)*
Definite	1 (8.0%)	2 (13.3%)	3 (11%)
Some	6 (50.0%)	8 (53.3%)	14 (52%)
Little	2 (17.0%)	2 (13.3%)	4 (15%)
No	2 (17.0%)	3 (20.0%)	5 (18%)
No opinion	1 (8.0%)	0 (0.0%)	1 (4%)
Total	12 (100%)	15 (100%)	27 (100%)

had little or no interest in having any involvement in this type of anaesthesia.

Qualitative data

Section 2 of the questionnaire yielded more than 70 statements relating to the anaesthetic SpRs' experiences and attitudes to ambulatory dental general anaesthesia. These were grouped into four themes:

1 *Benefits of training in ambulatory dental deneral anaesthesia*
2 *Risks of ambulatory dental general anaesthesia*
3 *Factors influencing provision of ambulatory dental general anaesthesia*
4 *"Ambulatory dental general anaesthesia is an outmoded and obsolete technique"*

Within each of the themes, Mersey and South- West respondents generally gave similar responses, with one exception, which was to the statement posed -"Ambulatory DGA is outmoded and obsolete technique". Here there were contrasting responses from the two regions.

1 Benefits from training in ambulatory dental general anaesthesia

For the trainee

The majority of the respondents who had undergone training in ambulatory DGA had comments relating to its benefit within their training programme

Trainees recognised the uniqueness of the airway management technique

'Gives experience in shared airway management.' (M)

' Improves airway management skills, that can be transferred elsewhere'. (M)

'As for any anaesthetic procedure there is a learning curve, for self-sufficiency and more importantly sharing an airway. This is arguably a smaller curve in the case of DGA than some other techniques.'(SW)

Ambulatory DGA training enabled trainees to increase their overall paediatric management skills

'Enhances paediatric skills.' (M)

'Enhances skills in patient clinical assessment under general anaesthesia, rather than relying upon monitors, as we can sometimes lapse in to.' (M)

'A lot in one case- paediatric management, day case and short case.'(SW)

'Familiarity with a less common technique for the management of children.'(SW)

There was one respondent who did not agree with training for DGA

'I think that there is no need to receive training in this area' (SW).

A number of the trainees recognised that training and experience was paramount to the success of ambulatory DGA

'If an anaesthetist is willing to undertake ambulatory DGA, then they must be trained and experienced- it is not to be undertaken lightly.'(SW)

'It is important that the anaesthetist practising ambulatory dental GA is aware of the morbidity and mortalities that have occurred during these procedures, and should definitely gain experience from a consultant during training.'(M)

'Training allows the procedure to be undertaken safely.'(SW)
'Less stress for anaesthetists if formally trained.'(M)

Finally, there were a number of trainees who recognised that ambulatory DGA gave experience in the wider delivery of anaesthetic practice

'Major exercise in logistical organisation of high volume short duration cases'.(M)

'Allows one to mange high turnover lists.'(SW)

'Incorporates team leading experience.'(M)

For the patient

Just under half of the trainees made comments relating to the benefit of ambulatory DGA training for the patient

'For children it is less of an ordeal and is not perceived as having an operation.'(M)

'They can quickly return to daily activity.'(M)

'There is less pre-operative waiting time.'(SW)

'Allows the individual a quick technique and normalisation.'(SW)

2 Risks of ambulatory dental general anaesthesia

The majority of respondents reported that the risks involved in ambulatory DGA are usually related to lack of operator experience, and inadequate facilities.

'Ambulatory dental GA is not without risk, it is dangerous without prior experience.'(M)

'Any anaesthetic given by an unsuitably trained person, without adequate equipment is risky.'(M)

' Not risky if undertaken in appropriate locations, with right resources and knowledge.'(SW)

'With training and planning it should be as safe as any day case anaesthesia.'(SW)

One respondent was of the opinion that even with training, ambulatory DGA was a dangerous procedure

'In the spectrum of modern anaesthesia it is a high risk procedure.'(SW)

A further respondent expressed a different view

'The figures in the literature do not support the statements of ambulatory DGA having a high mortality. Actually they appear to show that in general it is quite safe.'(M)

3 Factors influencing the provision of ambulatory dental general anaesthesia

The main factors were related to facilities and the support team

'There must be adequate resources, recovery facilities and nursing staff.'

'It needs the appropriate resources and knowledge.'

'Team members need to know what to do in the event of a cardiac arrest.'

It was apparent that a few respondents were unaware of the recent recommendations,

'If general anaesthesia for dental extractions is needed these patients should come into a hospital.'(M)

' You need back up- dentist and staff may not be able to help with resuscitation, as this is an infrequent experience for them.'(SW)

'There are not enough competent members to form a team.(M)

There were issues not just related to facilities that would prevent some respondents providing the service

'Very little interest in paediatrics.'(M)
' Never wish to anaesthetise children again.'(M)
'Lack of interest in this technique.'(SW)

4 "Ambulatory dental general anaesthesia is an outmoded and obsolete technique"

The anaesthetic SpRs were asked to give their opinions about the statement *" Ambulatory DGA is an outmoded and obsolete technique"* .The responses from each region were contrasting. Those from Mersey region appeared to have a more positive attitude towards ambulatory DGA than, respondents from the South- West.

Mersey

'Will always be a niche for ambulatory dental GA in appropriate environment for patients who aren't suitable for sedation or local anaesthetic.'

'I do not think that we should write ambulatory dental GA off, we should improve it. Make it attractive for both patients and anaesthetists'

'Children still have bad teeth and need them out under GA. So long as dental GA is done safely in the right environment, I disagree with the above statement.'

'Obsolete? i.e. replaced by another more expedious technique, which is safe and efficient I think not.'

'No. Allocation of dental chair sessions as part of a consultant contract may improve the exposure of trainees to this area.'

South-West

'This service should be phased out.'

'I am not aware of any current medical need for this type of anaesthetic practice.'

'It seems contrary to current guidelines to encourage/support a practice that is of comparatively higher risk.'

Discussion

This study is unique in that it provides an insight into the opinions that future consultant anaesthetist's hold about the provision of ambulatory dental general anaesthetic services (DGA). The limitations of this study should however, be recognised. The study population remains a selected group, with only two training schemes involved and the results therefore cannot be readily extrapolated to the wider population of final year SpRs in anaesthesia. The study identified the views of the trainees in anaesthesia at one point in time in their training programme. There is no way of knowing if the opinions and attitudes of the SpRs alter once they have become employed as consultants. A quarter of anaesthetic SpRs in the South-Western deanery had received no formal training in ambulatory DGA, and SpRs in the Southwest held the greatest misgivings about the ambulatory DGA technique. The respondents who had received training, in both schemes reported that they had undergone both theoretical and practical training in ambulatory DGA, although it is not clear how many cases of ambulatory DGA each SpR had administered. The SpRs were aware however, that the risks associated with ambulatory DGA are in the main related to lack of anaesthetists' experience in the procedure. This is an important factor, in view of the fact that at the present time there are no clear guidelines as to the level of training required for those administering ambulatory DGA. It has been suggested that to be competent in the administration of ambulatory DGA many cases are required amounting to an apprenticeship type of training (Bricker, 2002).

Furthermore, the majority of anaesthetic trainees questioned had little interest in pursuing ambulatory DGA once they had qualified. It would appear that the consultant anaesthetists of the future do not see ambulatory DGA as a key area of their work. Given the risks which have been associated with this type of anaesthetic care, such an observation may be deemed a positive development, however there will inevitably be those who are likely to be disadvantaged by it.

In 2003, mean decay levels amongst 5-year-olds in the Northwest of England were higher than the national average, with approximately half of all 5-year olds are affected by decay (Pitts *et al.,* 2003). The British Society of Paediatric Dentistry (BSPD), in its policy document on the management of caries in the primary dentition (Fayle *et al*., 2001) claims that extraction under general anaesthesia is preferable to no restorative care. In areas of the country, like the Northwest, with relatively high levels of childhood decay there will therefore be a continuing need for dental extractions under general anaesthesia, particularly for children who are too young to tolerate treatment using local anaesthetic and inhalation sedation. It is important for these children that easily accessible and available ambulatory DGA services continue. Given that very few anaesthetic trainees in the Southwest and Northwest regions indicated that they had a definite interest in providing an ambulatory DGA service, there must be concerns about the future availability of this service in these parts of the country. The children with the highest dental disease levels tend to come from socio-economically disadvantaged sections of the community (Carlisle *et al*., 2002; Pitts *et al*., 2003) and if ambulatory DGA services become increasingly scarce, it is likely that the major impact of this potential service reduction will be felt within these communities.

Research suggests that primary care dentists faced with curtailed ambulatory DGA services find it difficult to establish coherent alternative strategies for dealing with children who in the past would have been referred for ambulatory DGA (Tickle *et al*., 2002; Milsom *et al*., 2002). Dentists appear to improvise by adopting alternative approaches to the care of these children, including the use of antibiotics. However, recent studies have been critical of the antimicrobial prescribing behaviour of General Dental Practitioners (Palmer *et al.,* 2000).

If ambulatory DGA services for children 'wither on the vine', without the establishment of an alternative strategy

to address the needs of those for whom the service has been so effective, questions will inevitably be raised about the dental profession's ability to care for the most needy in society. Against a background of no significant change in the proportion of 5-year olds with decay in the primary dentition and a shift toward an approach in which dentists are increasingly comfortable treating the carious primary dentition as a temporary structure requiring maintenance rather than repair, leaving carious primary teeth unfilled (Levine *et al*., 2002; Pitts, 2004), it is easy to forget that caries rates among 5-year old children in the UK remain unchanged. Whilst this is so, there will be the need to offer 'treatment of despair' services to those children in pain with multiple carious primary teeth for whom all other approaches have failed.

If the availability of ambulatory dental general anaesthetic services is likely to decline, is it the case that anaesthetic SpRs are considering providing alternatives to ambulatory DGA? Are they looking towards providing all treatment within a normal day-case operating theatre environment? Thus losing the ability to provide a rapid and responsive service. Alternatively, are they following current regulations which suggest that behavioural management techniques and conscious sedation should be used wherever possible as alternatives to ambulatory DGA (Donaldson and Wild, 2000). However, in both regions the majority of anaesthetic trainees had no training in child conscious sedation. A recent study of consultant anaesthetists in Scotland reported that only 12% of the consultants sampled were involved in the provision of conscious sedation for dental procedures, and many had reservations about dentists training in this area of service provision (Shearer *et al*., 2004). This lack of commitment could further jeopardise the provision of dental services for children in need of pain and anxiety control in dentistry.

From April 2006, all primary care dental services became the responsibility of Primary Care Trusts (PCTs). Success within the new dental contract will be measured by how effectively PCTs commission dental services within the framework of the new contract. There will be a need to ensure that there is access to NHS primary dental care services for the large numbers requesting it and whose voice is clear. At the same time PCTs should be mindful that they have a responsibility to secure appropriate services for the small numbers within the community that have significant dental needs, but whose voice is less strident. Amongst these needy groups are the children who require dental general anaesthetic services and PCTs must continue to make it clear that they intend to meet the needs of these children.

Conclusion

Within the Northwest and Southwest of England, the majority of specialist registrars in anaesthetics receive training in ambulatory dental general anaesthesia, although the future commitment of these trainees to the delivery of ambulatory dental general anaesthetic and sedation services is questionable.

Given that in the UK levels of dental caries in young children are not improving and that there will for the foreseeable future be a cadre of children with multiple carious teeth for whom appropriate care involves extraction under general anaesthesia, it is important that swift access to such services is maintained.

Acknowledgements

The support of the regional anaesthetic training advisors in the conduct of this study is gratefully acknowledged. We also extend our thanks to the SpRs who gave their time to complete the questionnaire.

References

Bricker, S. (2002): "Chair Dentals": Outpatient Dental Anaesthesia in the UK. *Anasthesiol Intensivmed Notfallmed Schmerzther* **37**, 637-640.

Carlise, R. Avery, A.J. and Marsh, P.J. (2002): Primary care teams work harder in deprived areas. *Public Health Medicine* **24**, 43-48.

Clinical Standards Advisory Group. *(1995): Dental General Anaesthesia.* HMSO, London.

Donaldson, L. and Wild, R. (2000): *A Conscious Decision. A review of the use of general anaesthesia and conscious sedation in primary dental care.* London: Department of Health.

Fayle, S.A., Welbury, R.R. and Roberts, J.F. (2001): British Society of Paediatric Dentistry. A policy document on management of caries in the primary dentition. *International Journal of Paediatric Dentistry* **11**, 153-157.

General Dental Council. (1998): *Maintaining Standards, Guidance to Dentists on Professional and Personal Conduct*. London: General Dental Council.

Levine, R.S., Pittts, N.B.and Nugent, Z.J. (2002):. The fate of 1,587 unrestored carious deciduous teeth: A retrospective general dental practice based study from northern England. *British Dental Journal*. **193**, 99-103.

Milsom, K.M., Tickle, M. and Blinkhorn, A.S. (2002): Dental pain and dental treatment of young children. *British Dental Journal* **192**, 280-284.

Murray, J.J. General Anaesthesia and Children's Dental Health (1993): Present Trends and Future Needs. *Anesthesia and Pain Control in Dentistry* **2**, 209-216.

Palmer, N.A.O., Pealing, R., Ireland, R.S. and Martin, M.V. (2000): A study of therapeutic antibiotic prescribing in National Health Service general dental practice in England. *British Dental Journal* **188**, 554-558.

Pitts, N.B., Boyles, J., Nugent, Z.J., Thomas, N. and Pine, C.M. (2003): The dental caries experience of 5-year-old children in England and Wales. Surveys co-ordinated by the British Association for the Study of Community Dentistry in 2001/2002. *Community Dental Health* **20**, 45-54.

Pitts, N.B. (2004): Are we ready to move from operative to non-operative/preventive treatment of dental caries in clinical practice? *Caries Research*. 38, 294-304.

Pitts, N. and Harker, R (2004): Children's dental health in the United Kingdom 2003. *Office of National Statistics.* London.

Poswillo, D.E.(1990): *General anaesthesia, sedation and resuscitation in dentistry*. *Report of an Expert Working Party* Department of Health: London. SPSS *for Windows Base Version 9.0.0.(1988):* SPSS Inc, Chicago.

Shearer, J., Wilson, K.E. and Gridler, N.M. (2004): A survey of the opinions of consultant anaesthetists in Scotland of sedation carried out by dentists. *British Dental Journal* **196**, 93-98.

Tickle, M., Milsom, K.M., King, D., Kearney-Mitchell, P. and Blinkhorn, A.S. (2002): The fate of the carious primary teeth of children who regularly attend the General Dental Services. *British Dental Journal* **192**, 219-223.