

Repeat Paediatric Dental General Anaesthetics: A Study of Two Regions

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Abstract

This paper describes the rate of repeat paediatric dental general anaesthetics at three hospital based dental GA clinics in two regions, providing dental extractions and comprehensive care over the five-year period from April 2009 to April 2014. Review of the dental records identified 5749 children who had received a dental GA during the study period. Overall 191 patients had a repeat dental GA (3.3%) with a further 9 going on to a third GA (0.15%). The average time between the first and subsequent dental GA peaked between 12 and 36 months.

Introduction

Dental caries is an entirely preventable disease and yet approximately 46,500 children and young people under 19 were admitted to hospital for treatment of dental caries under general anaesthetic (GA) in England in 2013-14 [1]. The number of children aged 16 years or under admitted to hospital for extraction of teeth under GA increased by 66% in England between 1997 and 2006 mirroring similar increases in other European countries [2-4]. Over the same period child oral health has improved with 54% of 8 year olds having no obvious caries in the deciduous dentition and 54% of 15 year olds having no obvious caries in the permanent dentition. Simultaneously, a significant proportion of children have caries in their primary teeth with 40% or more of children experiencing decay in the UK [5,6]. The increase in use of GA for dental treatment has occurred despite a clear consensus to reduce the reliance on dental GA backed up with clinical research and guidelines [7,8]. The use of GA causes an increased morbidity and mortality compared with treatment under sedation or local anaesthetic. The Poswillo report published fifteen years ago clearly stated that the use of general anaesthesia should be avoided wherever possible and the more recent Royal College of Anaesthetists guidelines supporting increased use of sedation in place of dental

GA [9,10].

Some children will inevitably require a GA for dental treatment; these include very young children with extensive dental decay and highly anxious but otherwise healthy children who are unable to comply with dental treatment due to behavioural management problems. There are also a significant proportion of children who require treatment under GA related to a medical co-morbidity [11-14]. The number of children undergoing a second GA for dental treatment is of particular concern. A search of the literature revealed repeat paediatric dental GA in up to 11% of cases (10.7% to 11.9%) in the UK with a very similar finding of 11% in Finland (Table 1) [15-19]. Typical average time between the first and second dental GA was one to three years. The figures vary slightly depending on the period over which repeat GAs were included in the results; in some studies, the period was for a repeat within five years and in others the investigation was for the whole of the patient's childhood. The high rates of patients under 19 years of age being admitted to hospital for dental GA are unacceptable but the number who have a second dental GA are of even more concern.

The aim of this paper is to determine the rate of repeat paediatric GA for comprehensive dental care across two NHS Trusts in Southeast England and to try to identify some of the factors which influence the need for a repeat dental paediatric GA at the different centres.

Study	Primary care / Secondary care	Number of patients in study (mean age at first GA))	Mean interval to repeat	Percentage of repeat GAs
Albadra et.al. [16]	Secondary	278 (6.5y)	2 years 3 months	11.9
Harrison and Nutting [15]	Secondary	3872 (5.3y)	2 years 8 months	10
Kakaounaki et.al. [17,18]	Secondary	484 (6.3y)	1 year 8 months	10.7
Savanheimo and ehkalati [19]	Secondary	188 (6.2y)	1 year 10 months	11

Table 1: Summary of findings in studies of repeat GA.

Materials and Methods

The study population consisted of all patients undergoing a dental GA at three hospital-based dental general anaesthetic clinics, centre 1, centre 2 and centre 3, over the five year period from April 2009 to April 2014. These centres provide comprehensive care, not just extractions; they offer intravenous and inhalation sedation if appropriate, as recommended in the Guidelines for the Management of Children Referred for Dental Extractions Under General Anaesthetic of the Royal College of Anaesthetists [10]. The criteria for inclusion in the study group were children aged under 16 years and having received dental treatment under GA. Referrals for treatment come from primary dental care services; the dental assessment and treatment planning was carried out by dentists trained and experienced in behaviour management and treatment planning of comprehensive care under GA. Access to a specialist in paediatric dentistry was available if needed. The three centres were chosen to obtain approximately the same sized sample population from two geographical regions, centre 1 and 2 in the first region and centre 3 in the second. Approval for the study was sought through the NHS Health Research Authority and the Trust approval process. The dental records were accessed retrospectively for all patients who had received dental treatment under GA using the electronic R4 software (R4 Dental, Carestream Dental Ltd. Rochester, NY USA.). The contents of the dental records were analysed by four dentists each independently collecting data from the GA centre where they worked; common reporting of findings was agreed at a meeting before the data collection, with the design of a data collection form. The collected data from the dental records are shown in (Table 2).

Age
Clear justification for the use of dental GA including learning disability or complex medical history
Date of first dental GA
Date of second dental GA
Date of third or subsequent dental GA
Radiographs available prior to dental GA
Justification for not taking radiographs
Follow up appointment within three months

Table 2: Data collected from the dental records.

National guidelines

The indications for general anaesthesia for children are defined by the UK National Clinical Guidelines in Paediatric dentistry (2008) and the Royal College of Anaesthetists 2011 and suggest that GA should only be carried out if the child requires full anaesthesia before dental treatment can be attempted [2,10]. Factors to be taken into consideration may include: child co-operation, perceived anxiety, complexity of treatment, extent of surgical trauma and medical status [20].

Results

Review of the dental records identified 5749 children who had received a dental GA during the study period (2793 from the first region, centre 1 and 2, and 2956 from the second region, centre 3). Overall 191 patients had a repeat dental GA (3.3%) with a further 9 going on to a third GA (0.15%), figure 1. The average age of a child at the first GA that went on to have a repeat GA was 5 years 8 months. Up to 30% of those patients having a second dental GA had a learning disability or complex medical history, figure 2.

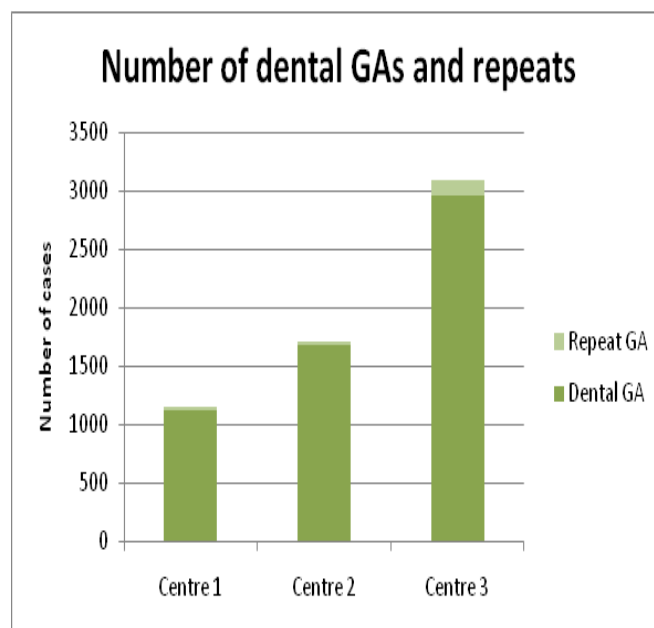


Figure 1: Histogram of number of GAs and repeats for each site.

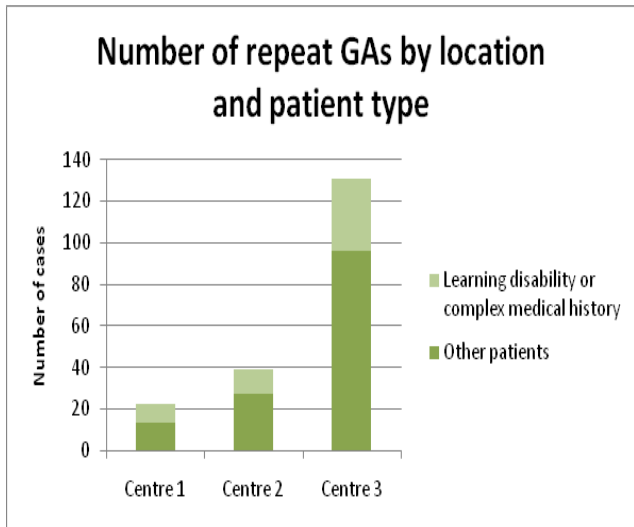


Figure 2: Histogram of patient type for repeat GAs at each site. The average time between the first and subsequent dental GA peaked between 12 and 36 months, figure 3. Most patients were not followed up at 3 months post GA as the patient was discharged immediately after the GA back to their general dental practitioner (GDP) for follow up care, figure 4.

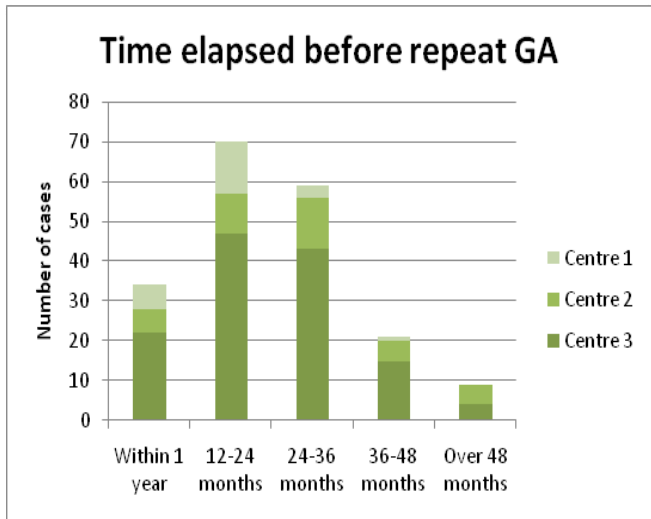


Figure 3: Histogram of time elapsed to repeat GA.

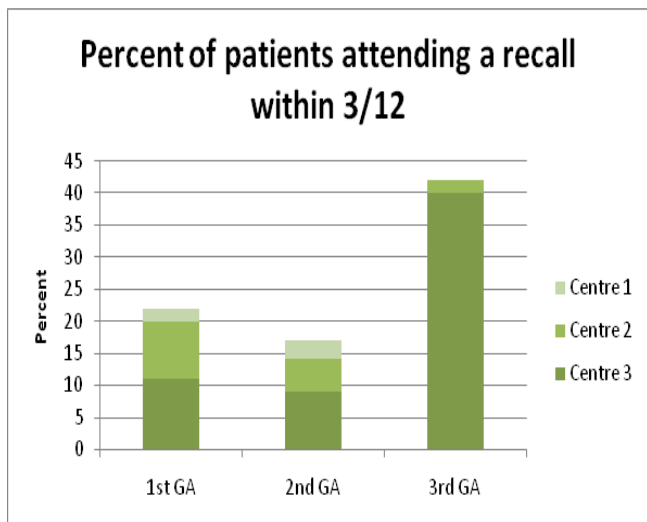


Figure 4: Histogram of number of cases attending recall within 3 months.

In over sixty percent of cases there were no radiographs available at the treatment planning stage; for a further ten percent of cases there was a clear indication in the notes as to why radiographs were not possible, figure 5. There was a clear justification in the clinical notes for the use of GA in the majority of cases, figure 6.

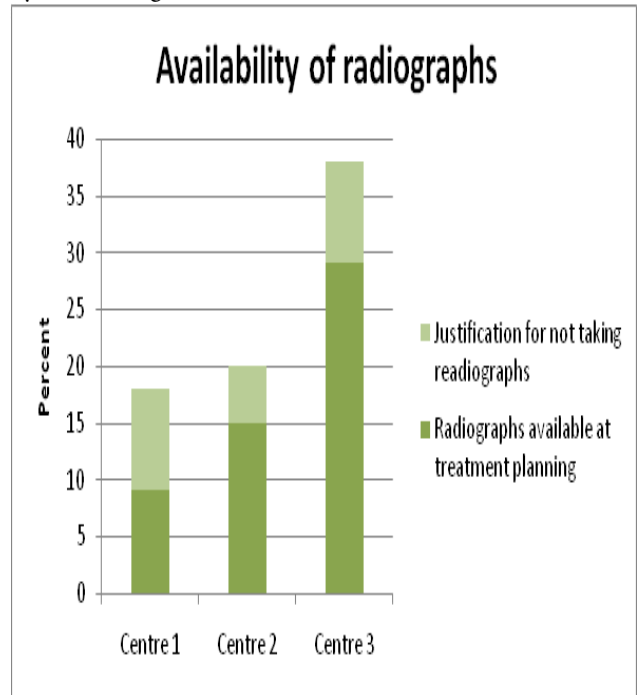


Figure 5: Histogram of the percent of cases with radiographs available at the treatment planning stage.

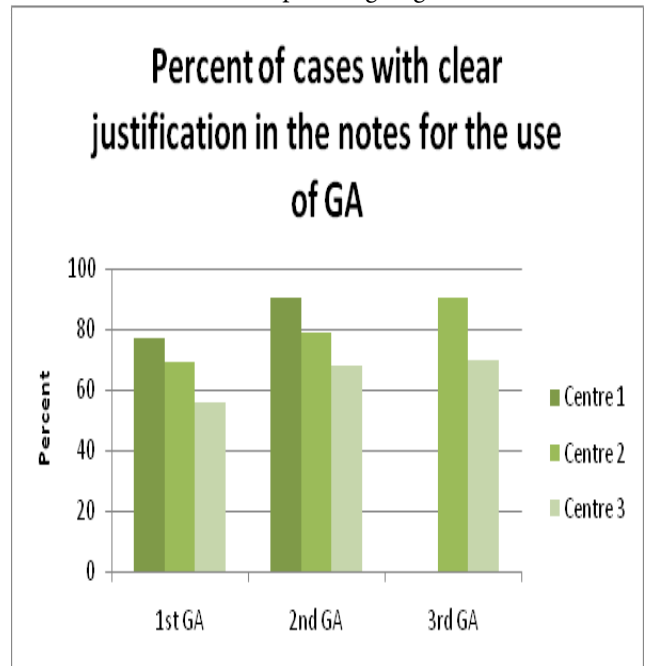


Figure 6: Histogram of the percent of cases with a clear justification in the notes for the use of GA.

Discussion

The overall rate of repeat dental GA compared favourably with other published studies, (Table1). There was a clear indication recorded in the notes for the need for a GA in over sixty percent of cases. The three dental GA centres cater for a mix of metropolitan and rural populations who have relatively good oral health overall with approximately fifteen percent of the repeat GAs for patients with a learning disability or complex medical history. It is significant that the need for the second dental GA peaks within twelve to thirty six months, a finding which matches the early repeat dental GAs in the other studies shown in (Table1).

Centre 3 had a slightly higher rate of repeats than the other two centres. There are a number of factors which might affect the rate of repeat GAs including the workload of the centres. Centre 3 had a full day with three half day sessions every week with an average of six to seven cases per session. Centre 1 and 2 had a GA list running for a full day per week alternating with a full day combined with a half day on alternate weeks and slightly fewer cases per session. Having a specialist involved in the assessment of patients should reduce the need for repeat GA; centre 3 has a specialist who is available for opinions but is not routinely involved in the majority of patient assessments. Less than thirty percent of patients had radiographs available at the treatment planning stage. There is the facility to take radiographs during the dental GA however this means the operating dentist needs to make the radiographic assessment and treatment decisions along with a new consent at the time of the GA which is not the recommended procedure for radiographic diagnosis or for consent. There should be scope to improve the number of available radiographs especially prior to the repeat episode. At the time of the second dental GA the child is older and possibly more co-operative; however it is our experience that with the right equipment and gradual familiarization, radiographs can usually be taken on children as young as four in most patients.

Oral health related quality of life is significantly improved following dental GA [21]. Treatment planning should take into account past history of caries, family history, and social history as well as the general attitude of the parents towards oral health [16]. There is evidence that the best outcomes following dental rehabilitation under GA may result from aggressive treatment of caries at the dental GA followed by active recall combined with education of parents [22]. A more radical treatment-planning approach, combining primary care, secondary care and public health considerations may avoid further unnecessary use of dental GA [15]. Less than half the cases had a dental recall within three months; this was largely due to the centres having a policy of referring the patients back to the GDP for continuing care. Dental GA does little to improve future patient compliance with dental treatment. Fear and lack of cooperation are frequently combined in paediatric patients at appointments following treatment under GA along with an increased number of missed appointments. Early attendance with improvements in compliance and familiarization should be strongly prioritized [19].

Parents that attend the dentist regularly have reported poor advice and oral health preventions especially in relation to fluoride [23]. All patients who have required a GA for their dental treatment should be considered as high risk and followed up closely to monitor dietary control and OH practices; NICE oral health check guidelines recommend a three month recall for high caries risk individuals and the Delivering Better Oral Health document clearly outlines the strategies for prevention tailored to individual patient needs based on their caries risk [24,25]. In Scotland the public health intervention Child smile has reduced caries prevalence by 30 percent in 5-year-olds [26]. The need to follow evidence based national preventive guidelines with a clear preventive message cannot be overstated.

We found that the mean age of a child at the first episode that subsequently went on to have a repeat GA was 5.8 years and that over 60 % of the repeat dental GA episodes took place within the first three years. Targeting children in this age group would seem sensible. In a similar study in Finland, the mean time to the first dental treatment following the dental GA was 18 months and children under 5 years of age seemed to remain disease free for longer than older children. However, nearly 40% of children needed operative treatment within the first year; half of these were within the first six months; the follow up care that a patient receives after a paediatric dental GA has a significant effect on the likelihood of needing further treatment under GA and the pattern of attendance is of particular significance in this respect [19]. Repeated failure to attend appointments can be a problem and availability of appointments at a clinic near to the patient's home and at a convenient time and with a good choice of appointment times will contribute to increased attendance. If there are any safeguarding issues these should be addressed by liaison with social services and health visitors as appropriate. If the parent and child feel that the prevention message and recall appointments are tailored to their needs, they are far more likely to feel they are obtaining a personal benefit from the interaction and more likely to engage with the process. There was a clear indication recorded in the notes of the need for a GA in over sixty percent of cases. It can be difficult to follow the reasoning and justification process within the clinical notes however, an understanding of exactly what it is that is driving the increased demand for GA in a population with decreasing overall caries experience could be a useful area for future research. As a retrospective study it was not possible to collect accurate data on many other important factors and a prospective study with agreed protocols might reveal more information.

Each centre has a slightly different preoperative assessment process and follow up policy. The R4 software made finding the data relatively easy but it remained difficult to reliably extract accurate data. The cases were a mix of exodontia for caries, exodontia for other reasons such as supernumeraries and cases booked for comprehensive dental care. Each of these might be expected to have a very different rate for repeat GAs. The inclusion of cases not involving caries might also account for the relatively low overall rate of repeat GAs compared with caries exodontia studies [15-18].

This mix of treatment in the different centres was similar to other regions across the country [27].

Conclusion

This paper describes the rate of repeat paediatric dental general anaesthetics and tries to identify some of the factors which influence the need for a repeat GA. A more radical approach to treatment planning should be considered including the availability of bitewing radiographs and where these are not available consideration should be given to including radiographs as part of the treatment under GA. Evidence-based prevention should be implemented and with the mean age of the first GA between five and six years of age, and the mean time between repeats of one to two years it would be worth particularly targeting prevention at families with children younger than five years old and families with children who have already had treatment under GA.

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References

- 1) Faculty of Dental Surgery, Royal College of Surgeons of England, (2015) The State of Children's Oral Health in England. London, UK.
- 2) Davies C, Harrison M, Roberts G (2008) UK National Clinical Guidelines in Paediatric Dentistry. Guideline for the Use of General Anaesthesia (GA) in Paediatric Dentistry.
- 3) Jamieson LM, Roberts-Thomson KF (2006) Dental general anaesthetic trends among Austrian children, BMC Oral Health 6: 16.
- 4) Haubek D, Fuglsang M, Poulsen S, Rølling I (2006) Dental treatment of children referred to general anaesthesia-associations with country of origin and medical status. Int J Paediatr Dent 16: 239-246.
- 5) Pitts NB, Evans DJ, Nugent ZJ (2001) The dental caries experience of 5-year-old children in Great Britain. Surveys coordinated by the British Association for the Study of Community Dentistry in 1999/2000. Community Dent Health 18: 49-55.
- 6) Child Dental Health Survey (2013) England Wales and Northern Ireland. Health and Social Care Information Centre.
- 7) Smith RB, Thompson SA (2007) An Audit of patient assessment and treatment outcomes in anxious patients referred for conscious sedation. 8/2: 57-62.
- 8) Holroyd I (2008) Conscious sedation in paediatric dentistry. A short review of the current UK guidelines and the technique of inhalational sedation with nitrous oxide. Paediatr Anaesth 18: 13-17.
- 9) Poswillo DE (1990) General anaesthesia, sedation and resuscitation in dentistry. Report of an Expert Working Party for the Standing Dental Advisory Committee. London.
- 10) Adewale L, Morton N, Blayney M (2011) Guidelines for the management of children referred for dental extractions under general anaesthesia, Royal College of Anaesthetists.
- 11) Birch Hill Hospital, Rochdale (1999) Referrals for dental general anaesthetics--how many really need GA? Br Dent J 187: 440-443.
- 12) Wong FS, Fearn JM, Brook AH (1997) Planning future general anaesthetic services in paediatric dentistry on the basis of evidence: an analysis of children treated in the Day Stay Centre at the Royal Hospitals NHS Trust, London, between 1985-95. Int Dent J 47: 285-292.

13) Harrison MG, Roberts GJ (1998) Comprehensive dental treatment of healthy and chronically sick children under intubation general anaesthesia during a 5-year period. Br Dent J 184: 503-506.

14) Camilleri A, Roberts G, Ashley P, Scheer B (2004) Analysis of paediatric dental care provided under general anaesthesia and levels of dental disease in two hospitals. Br Dent J 196: 219-223.

15) Harrison M, Nutting L (2000) Repeat general anaesthesia for paediatric dentistry. Br Dent J 189: 37-39.

16) Albadri SS, Jarad FD, Lee GT, Mackie IC (2006) The frequency of repeat general anaesthesia for teeth extractions in children. Int J Paediatr Dent 16: 45-48.

17) Kakanounaki E, Tahmassebi JF, Fayle SA (2011) Repeat general anaesthesia, a 6-year follow up. Int J Paediatr Dent 21: 126-131.

18) Kakaounaki E, Tahmassebi JF, Fayle SA (2006) Further treatment needs of children receiving exodontia under general anaesthesia at a teaching hospital in the UK. Int J Paediatr Dent 16: 263-269.

19) Savanheimo N, Venkalahti M (2014) Five-year follow-up of children receiving comprehensive dental care under general anaesthesia. BMC Oral Health 14: 154.

20) RCS England (2008) UK National Clinical Guidelines in Paediatric Dentistry: Guideline for the Use of General Anaesthesia (GA) in Paediatric Dentistry.

21) Jankauskiene B, Virtanen JI, Kubilius R, Narbutaite J (2014) Oral health-related quality of life after dental general anaesthesia treatment among children: a follow-up study. BMC Oral Health 14: 81.

22) Sheller B, Williams B J, Hays K, Mancl L (2003) Reasons for repeat dental treatment under general anaesthesia for the healthy child. Pediatric Dentistry 25: 546-52.

23) Olley RC, Hosey MT, Renton T, Gallagher J (2011) Why are children still having preventable extractions under general anaesthetic? A service evaluation of the views of parents of a high caries risk group of children. Br Dent J 23: 210.

24) National Institute of Clinical Excellence (NICE) (2004) Dental checks: intervals between oral health reviews.

25) Public Health England (2014) Delivering better oral health: an evidence based toolkit for prevention.

26) Macpherson LM, Ball GE, Brewster L, et al. (2010) Childsmile: the national child oral health improvement programme in Scotland. Part 1 Establishment and development. Br Dent J 209: 73-78.

27) Goodwin M, Sanders C, Pretty IA (2015) A study of the provision of hospital based dental general anaesthetic services for children in the North West of England: part 1-a comparison of service delivery between six hospitals. BMC Oral Health 15: 50.

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