

'I felt weird and wobbly.' Child-reported impacts associated with a dental general anaesthetic

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IN BRIEF

- Provides a new insight into the emotional and psychological impacts of having teeth out under general anaesthetic (GA), entirely from a child's perspective.
- Describes the use of a video diaries as a participatory technique for health-related research with young patients.
- Suggests that pre- and post-operative instructions for a dental GA should be more tailored to the child's needs.

RESEARCH

Aim This qualitative study sought to obtain children's accounts of having dental extractions under general anaesthesia (GA). The aim was to gain greater understanding of the physical and psychological impacts from a child's perspective.

Method Ten children, aged 6–11 years, maintained a video diary to document their feelings and experiences before, and following their hospital admission. Two semi-structured home interviews supplemented the video diary data and analysis was guided by narrative approaches.

Results This research revealed new insights into children's experiences of having teeth removed under GA. Several of the post-operative impacts correlated with those previously reported by parents/carers. These were notably nausea, bleeding and tiredness, although children used different terminology. However, additional physical and psychological outcomes, both positive and negative, emerged from the children's narratives.

Negative aspects included hunger, disturbed eating, being scared/worried and experiencing discomfort from the IV cannula. Interestingly, pain was not a strong theme. Positive outcomes were also reported, such as satisfaction with the resolution of their dental problem and receipt of rewards and attention from family members. **Conclusion** These accounts have implications for improving patient experiences and outcomes throughout the dental GA care pathway. A review of pre-operative fasting protocols should be a priority.

INTRODUCTION

The most common surgical intervention in paediatric dentistry is, of course, tooth removal. While this is predominantly undertaken using local anaesthetic, there are some patients for whom general anaesthetic (GA) is a necessary adjunct. In the main, these are young children, from areas of high deprivation, who require multiple extractions of their carious primary teeth.^{1,2} Data from the UK indicate particularly high usage, with around 57,000 children receiving dental treatment under GA each year.²

In view of how many children undergo dental treatment under GA (DGA), seeking the experiences of young users should be fundamental to any service evaluation. To date, patient outcomes relating to the paediatric DGA have been largely sought from clinicians, parents and carers.^{3–6} It appears that between 40 and 90% of children experience adverse post-operative

symptoms, commonly referred to as morbidities, including: pain; headache; nausea; vomiting; sore throat; sleepiness and bleeding.^{3–8} In one of the few studies to engage children themselves, Atan and colleagues⁹ interviewed 121 children, aged 6–16 years, over a period of one week following their DGA. Data were presented separately according to the effects of the dental procedures and those of the GA itself. The most common and long lasting complaint was pain at the operation site, which reportedly affected 70% of participants 36 hours post-operatively. Although the investigators did consider emotional impacts, as children were asked about having 'bad dreams', no prevalence data were reported. In fact, surprisingly little is known about the short- or long-term psychological impacts of a DGA on children.

Over the last decade, patient-reported outcome measures (PROMs) have found increasing application in evaluating the effectiveness of a variety of surgical interventions.^{10–12} A range of pre- and post-operative impacts (physiological, pathological, psychological and social) may be evaluated, both in the short and long term. In dentistry the main PROMs used are measures of oral health-related

quality of life (OHRQoL). While OHRQoL measures have been used to assess impacts following a DGA¹³ these have largely used parents as proxies. These proxy measures have identified marked improvements in child OHRQoL following comprehensive dental treatment under GA.^{13–15} However, it is acknowledged that parental assessment of a child's OHRQoL may be limited and inaccurate.¹⁶

A review of the literature to date suggests that impacts from a DGA have been proposed mostly from the perspective of clinicians and parents/carers, and not from children themselves. The aim of this study, therefore, is to seek children's own descriptions of the physical and psychological aspects of their DGA.

METHODS

Participants

Ten children, aged 7–13 years, eight of whom were girls, participated in the study before data saturation was reached. All children had been previously assessed in a UK dental hospital by a consultant paediatric dentist and required simple dental extractions under GA. On average, participants underwent the removal of six primary and/or permanent

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teeth (range = 3–12 teeth). No other dental treatment was performed. The GA itself involved a gas or intravenous induction and use of a laryngeal mask airway. Children also received intra-operative local anaesthetic to extraction sites and rectal or oral paracetamol for pain relief. The nature of the study was explained to potential participants and their parents and written consent was obtained. Ethical approval for the study was granted by the local NHS Research Ethics Committee (reference 10/H1310/52).

Approach

Data collection involved two activities: the child's documentation of their thoughts and experiences relating to their DGA using a personal video diary, and two semi-structured interviews to further explore their accounts of this event. This approach has been previously described by the authors in a related study that reported on children's participation within the DGA pathway.¹⁷ However, video diaries have not yet found common usage in oral health research. Interestingly, the use of visual narratives has been well described in the wider paediatric medical literature as a means of gaining a more meaningful insight into children's experiences of illness and healthcare.¹⁸

Two weeks before their admission to the local children's hospital for the DGA, a member of the research team visited each participant in their own home to conduct a semi-structured interview. The interviews sought to explore children's understanding and feelings about their forthcoming DGA. Parents/carers were free to sit in on the interview if they or their child wished, but conversations were directed towards the young participants. The topic guide was very loose with open ended questions that invited children to talk about why they were going to hospital and how they felt about it. The researcher also provided children with a video camera (Kodak Zi8) and ensured that the children (and their parents) were able to turn the video camera on and off and position it correctly. The cameras were fitted with 16 GB memory cards to allow up to four hours of recording time. Children were given a simple written list of possible things they could talk about before the admission such as: 'when are going to hospital; what do you think will happen there; how do you feel about it?' They were also invited to tell us about the DGA and how they felt afterwards: 'what happened at the hospital; what was it like; how long were you there for; how did you feel afterwards; how long were you off school; did it affect your mood; did anything hurt; did your mouth feel different afterwards; any good things about it; any bad

things about it?'. However, participants were informed that the project was theirs to direct as they wished and they did not have to talk about any of the suggested topics if they did not want to. A second interview was carried out within a fortnight of the DGA to explore the content of the video diaries, follow up on any new experiences revealed in the narratives, and reflect on the event. Audio data from the interviews and video diaries were transcribed verbatim and children chose pseudonyms to maintain confidentiality.

Data analysis

Data analysis took a narrative approach in order to discern meaning from participants' stories.^{19,20} Data collection and analysis were conducted concurrently and recruitment ceased once no new themes emerged. Video and interview transcripts were read and reviewed several times by two investigators who coded the data to identify emergent themes and used frameworks to organise the data into these themes. The frameworks were informed by the chronology of the care pathway, to include pre-, peri- and post-operative events. Themes were then discussed and agreed by all members of the research team and a report of the analysis was sent to participants for verification.

RESULTS

A wealth of visual and narrative data was obtained relating to the DGA. On average, each participant had filmed themselves on three separate occasions (range of clips = 1–7). The mean film time for each clip was two minutes (range = 40 seconds to 8 minutes). The interviews ranged from around 30 to 60 minutes in duration. Table 1 summarises the main physical and psychological impacts at three time periods during the DGA pathway (pre-, peri- and post-operatively). The words that the participants actually used to describe the various impacts are also listed. Participants described impacts in a highly sensory manner, referring to taste, touch, smell and sights, and related these to both the GA and tooth removal. It can also be seen from Table 1 that physical impacts were described more frequently than psychological ones. A descriptive analysis of the children's narratives within the different themes is presented below with supporting quotations.

Before hospital admission

Before the DGA a recurring theme was that of the sensation of hunger, due to the requirement for pre-operative fasting. The following extracts describe this impact.

'Well I couldn't have anything to eat. I was starving. STARVATION [shouted for emphasis].' (Amy, aged nine, interview)

In some cases, family members were seen to be gatekeepers in ensuring that the child remained starved before their operation.

Ryan's dad: *'And what have you got to remember not to do?'*

Ryan: *'Not to eat. Not even have a drink until after the operation.'* (Ryan, aged ten, video)

In Briony's case her brother's involvement was less supportive.

'My brother was teasing me with a glass of orange juice.' (Briony, aged 13, interview)

The second theme to emerge in the pre-operative period was that of being worried about the forthcoming DGA. This emotion sometimes manifested as a physiological impact, such as feeling sick or actually being sick.

'I threw up last night and me and my mum believe it's because I'm nervous of being put to sleep to tomorrow... I am a bit nervous about going to sleep, how I'll feel, 'cos I don't know what it feels like to go to sleep. I'm curious about that.' (Claire, aged 11, video)

'It's the night before my operation and I feel scared of them putting me to sleep.' (Ryan, aged 10, video)

Peri-operatively (in hospital)

Narratives about the admission and GA induction focused on the unpleasant smell of the gas and some continued feelings of anxiety.

'Well, I've had my operation done, and as I was getting put under the anaesthetic, the first gas it was quite unusual, but it wasn't too bad though. But the second gas, apparently its normal to not like it and to try and fight to get it off, it's quite normal, well the doctor said... it was like a nail varnish or new whiteboard pen smell.' (Claire, aged 11, video)

'I would not have the gas; I'd have the needle... I hate the smell of nail varnish, and that's the smell.' (Chloe, aged ten, interview)

In recovery, the children reported a number of negative physical impacts that included pain at cannula site and feeling sick. Some children were upset by the cannula as they were unprepared for it and it caused a bruise. Not all children reported pain at the extraction sites. Bleeding was frequently noted in terms of the altered taste in their mouth, the sight of it on the pillow and the 'disgusting pieces of wool' [swabs to stop the bleeding].

'When I woke up, my teeth hurt and were pulled out. I was crying a bit because my mouth hurt.' (Martha, aged 10, interview)

'My mouth... it tasted different, obviously because of the blood, but I didn't, well, obviously because I was all numb, after a while, I didn't feel much different. I was just very tired.' (Claire, aged 11, interview)

Table 1 Key child-reported physical and psychological impacts associated with tooth extractions under general anaesthesia, and descriptors employed

Theme/time period	Impact	Terms/descriptions used
Physical		
Pre-operative	Hunger	'Starving'
Peri-operative	Smell of anaesthetic gas	'Not nice', 'like nail varnish', 'Like pens'
	Cannula	'Itchy', 'hurt', 'irritating', 'Bruised'
	Nausea	'Sick'
	Oral pain	'Hurt', 'sore'
	Numbness	'Numb', 'funny', 'big', 'strange'
	Dizziness	'Wobbly', 'dizzy', 'weird'
	Bleeding	'Bleeding'
Post-operative	Bleeding	'Lay on sofa'
	Tired	'Felt sick'
	Nausea	
	Difficulty eating	
	Difficulty brushing teeth	
	Oral pain	'Not proper pain', 'hurt', 'aching'
Psychological		
Pre-operative	Anxiety	'Nervous' 'Scared'
Peri-operative	Anxiety	'Scared'
Post-operative	Sense of achievement	'Brave', 'relieved', 'glad it was over'
	Rewarded, given special treatment	'Money from the tooth fairy', 'day off school', 'toys', 'allowed to watch TV'

'When I first had them took out, it was bleeding a lot but it calmed down. Obviously, I could taste the blood in my mouth, 'cos I had had some teeth out, I could feel the gap, I couldn't feel pain because I had had this medicine type thing, needle, put in my hand, and I have a bruise, but it's alright' (Briony, aged 13, interview)

'We didn't even know he was going to have a catheter [cannula] in until he came round from the operation and he'd got it in his hand and he was wanting to know what that was, he was quite freaked out.' (Mother of eight-year-old boy, Richard, in joint interview)

Another recurring theme, in the immediate post-operative phase, was that of altered neurological sensations, both from the effects of the GA and the local anaesthetic. Children commonly described feeling 'dizzy' or 'wobbly'. They recounted these sensations as 'weird' and 'strange' but did not seem to be unduly distressed by them.

'I woke up and my jaw felt funny, very funny... when I felt my chin, it felt all big.' (Catherine, aged seven, interview)

'[I felt] a bit sleepy and a bit wobbly wobbly. My mouth felt a bit weird and so did my teeth.' (Amy, aged nine, interview)

'When I woke up I was dizzy and when I walked I thought I would fall over but I didn't. I was wobbly outside.' (Amy, aged nine, video)

Post-operatively (at home)

In the transition between hospital and the home, bleeding was described as the most common physical impact.

'One was still bleeding but the other was alright, but in the car, I thought I had something in my mouth, so I spat and it was just like a massive clump of blood, as red as dark as that apple so I covered it up and shoved it away and put it in my sick bowl, except I wasn't sick.' (Claire, aged 11, interview)

'The funny bit was when I came out of hospital and my teeth were bleeding and at the same time my nose was bleeding. It tasted funny.' (Amy, aged nine, video)

In the ensuing couple of days post-operatively, the most notable functional impact of the DGA related to eating. Participants described the kind of food they ate and how they ate it, as well as citing occasions where eating caused bleeding or discomfort. Crisps were mentioned as causing bleeding or pain. It was clear that the children adapted their dietary habits to manage their oral condition and also relied on carers to help them with eating.

'I could only eat noodles afterwards because I was absolutely starving because well I couldn't chew, so it's quite hard... Well, I chose noodles; I like noodles better than soup. I had that and then, when we had a proper family dinner when my sister was home, I wouldn't mind that if it was mash and stuff. But when I got back to school, we had chocolate crunch, which is my favourite and I couldn't eat it.' (Claire, aged 11, interview)

'I couldn't have hot or cold... only have warm. Scrambled eggs and bread and butter.' (Martha, aged ten, interview)

'I had sausage, I liked sucking them, but I didn't bite them. I had three. I didn't bite it. Softened it up and swallowed it... I tried crisps and accidentally bit on the gum but it stopped bleeding quite quickly.' (Amy, aged nine, video diary)

Although some short-term functional limitations in eating related to healing sockets, there was a perception that the lack of posterior teeth could affect eating certain food types in the longer term.

Chloe's mum: 'You haven't eaten apples yet.'

Chloe: 'No, because I need my back teeth. I can bite into them with my front teeth, but then I can't chew at the back.' (Chloe, aged ten, interview)

As well as describing some reservations about eating, children were hesitant about brushing their teeth following the dental extractions and seemed very unclear about when and how they should brush their teeth.

'I thought I could only start brushing them when the teeth grew back because I can't see where I am going, I might get my gums.' (Claire, aged 11, interview)

Interviewer: 'How long was it till you brushed your teeth again?'

Amy: 'Two nights and then on night three I could brush it again. I don't brush the gums.' (Amy, aged nine, interview)

Children described being very tired when they first got home and reportedly spent the rest of the day on a sofa watching television. Most had one to two days off school, which they were universally pleased about, and they didn't consider themselves as particularly poorly or being in pain.

'This settle, I was laid down like this... I fell asleep on the sofa' (Amy, aged nine, video)

'The next day, it didn't feel like I'd had my teeth took out at all. It doesn't hurt.' (Amy, aged nine, interview)

'It didn't hurt, it was just aching, it wasn't proper pain.' (Chloe, aged 11, interview)

Not all the impacts relating to the DGA were negative. In fact, children described a number of positive emotional and physical outcomes. They reported a sense of achievement and relief at successfully going through with the procedure. Furthermore, they were pleased that the treatment had been undertaken and perceived their oral health would improve and they would no longer experience toothache.

Interviewer: 'So how did you feel afterwards?'

Chloe (aged 11): 'Better. Glad that it was over. I was glad. Relieved.'

'And now at the end I'm feeling very very good about myself and also it's very good to have this [the DGA]. I felt great afterwards'

and I feel great now. I thought, should I feel scared or should I feel brave? And I thought, brave! I was brave and scared.' (Casey, aged eight, video)

Finally, participants were clearly delighted to be receiving money for their extracted teeth (from the 'tooth fairy') or presents from their families for being brave. They also enjoyed having special privileges, such as watching television and having their parents look after them.

'Hello, I'm Annie. I can't wait to have my teeth pulled out because I'm going to Toys R Us and I'm going to be brave when I have my six teeth pulled out.' (Annie, aged nine, video)

'I got to watch Scooby Doo. I had the telly for myself, but normally I share with my sister.' (Amy, aged nine, interview)

DISCUSSION

This study provides new insights into children's experiences of having teeth removed under GA. Although some of the post-operative impacts closely related to those reported by parents/carers, such as nausea, bleeding, tiredness and pain, this enquiry identified additional physical and psychological impacts throughout the care pathway, which had both positive and negative outcomes. Children principally described these impacts in terms of sensations: the feeling of hunger, the smell of the gas, the taste of blood and the sight of the cannula. It is important to now consider how these findings can be translated into improving patient care.

The most negative physical impact described was not pain but hunger and disturbed eating. Thirst did not appear to be an issue. Interestingly, a previous study of 1,350 Scottish children identified that they were fasted for excessive times before their DGA.²¹ Young patients had fasted for a median of 12 hours for solids and 7.5 hours for fluids, which is far longer than accepted protocol. Furthermore, the majority of children reported that they were very hungry or starving before their admission. This should be a priority area for improving the patient experience by providing clearer information for carers and children about required fasting times. Expert advice from dietitians could be also sought to inform families and dental health professionals as to what pre-fasting food types would best reduce feelings of hunger. Child-centred information could also be developed to help eating in the post-operative period by drawing on the experiences of other children. It may seem obvious to clinicians that crisps would traumatise healing sockets, but children in this study commonly

attempted to eat crisps, with resultant pain and bleeding. A simple visual post-operative guide could be easily produced for children and their carers suggesting good things to eat, such as noodles, soup or mashed potato. Post-operative information should also include specific advice on mouth care, as a number of children in this study seemed unsure about when and how they should brush their teeth following the extractions.

Another important (and previously undescribed) morbidity to emerge from this DGA study was the effect of the cannula. In some cases, this caused greater discomfort than the extractions themselves. Furthermore, it was apparent that some children were unprepared and were unsure of its purpose. For children undergoing a gas induction, the cannula is placed while they are anaesthetised, thus on waking they may be distressed by its presence. This is another area where child-centred pre-operative preparation may help to improve acceptance of this intervention.

It is interesting, however, that oral pain was not a particular concern, which contrasts with previous proxy reports.^{3-5,7,8} There are a number of explanations for this apparent discrepancy. Firstly, professional and self-care regimes for pain management may have improved in recent years. Data from this study showed that intra-operative local anaesthetic appeared effective in the short-term and children were given analgesics in the home setting. It is also possible that children wished to present themselves as being 'brave' in their video diaries and did not focus on pain. Although an analysis of the visual data is not presented in this paper, it is worth commenting that there was no occasion when a child appeared to be experiencing pain or discomfort following their extractions.

To date, there has been little exploration of the short- or long-term emotional impacts of a DGA. Some data suggest that dentally phobic adults identify a traumatic DGA at an early age as a causative factor for their anxiety.²² The present study has revealed that children certainly feel scared and worried before their admission, which may largely stem from not knowing exactly what is going to happen to them. This finding is in keeping with those of other studies that have sought to reduce pre-operative anxiety through information giving packages.²³ More recently The Royal College of Anaesthetists, UK²⁴ has developed three age-specific leaflets to prepare children and young people for a GA. Each leaflet provides a comprehensive description of the actual process and uses child-centred terminology. A fundamental feature of the leaflets is that they were

developed with children themselves. However, because of their generic nature, there is nothing specific to a DGA and the information given relates only to the pre- and peri-operative period.

A novel finding was that children actually report positive psychological outcomes following their DGA. This was evidenced by children feeling proud for having undergone their operation and being pleased that their dental problem had been treated. They also enjoyed being looked after or rewarded by their families. Further research would be valuable in identifying these positive coping behaviours and teaching them to other children. Contrary to traditional thinking and widespread public perceptions, a dental GA does not have to be a negative experience for a child.

REFLECTIONS ON THE STUDY DESIGN

The video diary approach was chosen to optimise children's participation and place them at the centre of the research. Furthermore, children were found to be adept in this form of communication, with only one instance of a failed recording, possibly due to the camera pointing in the wrong direction. Another problem encountered, and one that had been anticipated by the authors, was the loss of a video camera. An eleventh child was recruited to the study, but following her DGA and first interview, the family were not contactable to retrieve the video camera.

It was interesting to note how participants differed in the frequency of recordings, formats chosen and the audience to which the videos were addressed. Techniques included interviewing siblings or having a parent interview them. Video diaries, as a means of seeking children's experiences of illness and healthcare offer a number of advantages over more traditional approaches.²⁵ Firstly, young participants were empowered as to how and when they participated in the research study and had ownership over their video diary. This methodology also removed any potential for a power imbalance between an adult researcher and child participant.²⁶ Furthermore, it was possible for data collection to occur contemporaneously throughout the GA process, reducing the potential for recall bias. An acknowledged limitation of this study, however, was the short follow-up period of two weeks. Thus any long-term physical and psychological impacts arising from multiple extractions under GA remain elusive. Revisiting participants, 6-12 months following their admission would identify any persistent or new impacts, giving

clinicians a more holistic understanding of patient-reported outcomes.

Another avenue for further research would be to conduct a more detailed analysis of the language used by children relating to the GA and tooth extraction. Although participants used the terms, 'put to sleep', 'gas' and 'anaesthetic' in their video diaries, it is not known which terms are best understood by children. Indeed, there is evidence that some children may prefer clinicians to use plain (medical) language and not euphemisms.²⁷

CONCLUSION

This study has fully engaged children in identifying impacts relating to a DGA. Insights gained will be invaluable in developing patient-centred information and protocols to improving children's experience of this care pathway.

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