A prospective audit of a Day Stay Hospital service for the dental management of adults with disabilities

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Abstract

Aim: To carry out an audit of a day stay general anaesthetic/sedation service, for the provision of dental care to adults with physical and or intellectual impairments and/or who are medically compromised.

Objectives: To investigate current waiting times for care, establish the nature and frequency of medical complications, determine outcomes of dental treatment and obtain patient views relating to dental treatment on the Day Stay Unit.

Design: Prospective clinical audit.


Methodology: All adult patients attending for dental treatment under day stay general anaesthesia or conscious sedation at South Tyneside District General Hospital over a period of 24 months (December 2002 to November 2004) were audited. Using questionnaires, data on demographics, waiting times, dental and anaesthetic care provided, post-operative morbidity and patient satisfaction were collected.

Results: The average waiting time for care was 36 weeks. Dental treatment carried out differed greatly from that predicted at assessment. Minor post-operative complications only were reported in 35% of patients and the majority of patients were very satisfied with the treatment they received.

Conclusion: The standard for waiting times was not met and was exceeded by 12 weeks. More invasive treatment was required than had been anticipated resulting in an extended operative period, however peri and postoperative morbidity was found to be low. It is clear from the audit that waiting times are unacceptably high and as a result it would appear that the oral health of those with disabilities is being compromised. A business case has been submitted to the Primary Care Trust for increased resources to address the situation and if the bid is successful a further audit of the service will be carried out.

Key words: Day-stay, sedation, general anaesthetic, adults with disabilities

Introduction

Dental care for people who are intellectually and/or physically impaired, and those with moderate to severe medical problems, is often difficult to provide in the primary care setting.

Those with special health care needs have more dental disease, more missing teeth and experience greater difficulty in obtaining dental care than any other groups of the population (Kendall, 1992; Glassman and Miller, 2003). These individuals can be at an increased risk of developing dental disease, which may be attributed to, as well as exacerbate, existing medical conditions (Gordon et al., 1998). To compound this, the maintenance of oral health by regular examination, prevention and treatment may be difficult due to the limitations in patient co-operation (Manley et al., 2000).

In those with severe disability, co-operation is often lacking so that oral care and even an examination can only be carried out with the help of conscious sedation or general anaesthesia (Enever et al., 2000). Dental care for patients in this category must be provided on a 'day-stay' basis within a hospital setting in accordance with the Department of Health's recommendations (Pike, 2000).

Day-stay care involves the patient being admitted onto the ward for their procedure and discharged the same day. All patients attending for day-stay care under sedation or general anaesthesia require a pre-operative assessment to ascertain their fitness for the procedure and to formulate a
dental treatment plan (Association of Anaesthetists of Great Britain and Ireland, 2005). However due to the high preva-

lence of poor co-operation, which may include aggressive, antagonistic behaviour, it is often difficult to provide a complete pre-operative medical and dental assessment (Ananthanarayan et al., 1998). It follows that any adverse effects from intravenous sedation and general anaesthesia may be associated with unknown underlying diseases that have not been diagnosed or that may present in a sub-clinical way (Campbell, 1986). There may, in addition, be specific physical abnormalities such as spinal deformities, inaccessible veins and difficult airways which compromise the safe delivery of general anaesthesia or intra-venous conscious sedation in an outpatient department (Enever et al., 2000).

Due to such conditions, we might expect to witness an increased prevalence of post-operative complications relating to the general anaesthetic, sedation or the dental treat-

ment (Bettelli et al., 1990). This is a poorly researched area in dental anaesthesia and there is a paucity of literature available (Enever et al., 2000).

The aim of this study was to carry out an audit of a day-

stay general anaesthetic/sedation service, which provides dental care to adults with physical and or intellectual impair-

ments and those who are medically compromised, provided by South Tyneside Salaried Dental Service.

Material and Method

Design

The work was designed as a prospective, questionnaire based audit and received approval from the Primary Care Trust’s Clinical Governance Board.

Setting

All patients were admitted to the Day Stay Unit at South Tyneside District Hospital on the treatment day. The procedure was carried out in a dedicated theatre where the patient received their dental care under conscious sedation or general anaesthesia after which they were transferred back to the day unit until discharge.

Staff

Two dentists were present during the treatment visit in order to ensure a second opinion was available regarding the final treatment plan. Two dental nurses assisted with the treatment procedure. A consultant anaesthetist administered the sedation or general anaesthesia and was supported by an operating department practitioner. Registered general nursing staff cared for the patients pre and post operatively on the day unit. All staff were experienced in the management of the patient group in question.

Subjects

All adult patients attending for dental treatment under day-stay general anaesthesia or conscious sedation at South Tyneside District General Hospital over a period of 24 months (December 2002 to November 2004) were invited to take part. These patients were intellectually and/or physically disabled, medically compromised or suffering from dental phobia or anxiety.

All patients had received a pre-operative assessment by a consultant anaesthetist and a senior dentist. The purpose of that visit was to assess the patient’s medical status and fitness for conscious sedation or general anaesthesia. Where possible an oral examination was carried out and a provi-

sional treatment plan formulated. Considering the extent of dental treatment required and the patient’s medical status a decision was reached regarding the most appropriate management option.

Both urgent and non-urgent cases were included in the audit. As many patients with intellectual impairment are unable to verbally express dental pain the ‘urgent’ case was considered to be a patient demonstrating at least two of the following signs; facial swelling, disturbed behaviour leading to self harm, severely reduced food intake, disturbed sleep patterns, all of which cannot be explained by other medical reasons. These patients would receive earlier inter-

vention compared to non-urgent cases.

The purpose and design of the audit was explained to the patient and/or carer. Where the patient was able to give consent this was obtained in writing. Where the patient lacked the capacity to consent, assent was sought from the patient’s main carer following a full explanation of the audit process.

Standards

The standards being audited were as follows:

• Waiting times – the waiting times for day-stay treatment set by the Department of Health for consultant led serv-

ices and adopted by South Tyneside Primary Care Trust, were used as the gold standard. The guidelines state that patients should receive treatment within six months of their initial consultation. For the purposes of the audit the initial consultation was considered to be the first assessment visit with the dentist only.

• Average time for dental treatment – an average time of 60–90 minutes for the dental treatment to be carried out in a similar group of patients has been quoted by previous authors (Prabhu et al., 2003) and this was taken as the standard.

• 24-hour Post-operative morbidity – prevalence of 40–45% of patients experiencing nausea, discomfort and dizziness has been reported and was used to set the standard for morbidity (Enever et al., 2000).

Data collection

Data were collected by way of questionnaires and coded for each patient. Four questionnaires were completed at various stages of the patient’s management:

• Anaesthetic Questionnaire

This was completed by the anaesthetist following the general anaesthetic or conscious sedation, recording infor-
formation about the patient’s medical history as well as details of the induction and maintenance regimen used.

- Dental Questionnaire
  This was completed by the treating dentist immediately post-operatively, recording information regarding the reason for the patient receiving a general anaesthetic or conscious sedation and the dental treatment predicted and that carried out.

- Patient Questionnaire
  A Senior Dental Nurse contacted the patient by phone two days following the treatment visit and asked a series of questions relating to the treatment and aftercare they had received, as well as any post-operative problems they had experienced in the period after their day-stay attendance.

- Parent/Carer Questionnaire
  Where the patient was unable to answer for themselves, the carer was contacted two days following the treatment visit and asked a series of questions as above.

**Data analysis**

The data were entered onto an Excel (Microsoft) spreadsheet by the hospital audit department. The information from all the questionnaires was combined and analysed to give an overall picture of the general anaesthetic/conscious sedation event, the post-operative period and the outcome of treatment for the patient on returning home.

**Results**

A total of 84 patients were included in the audit, 36 (43%) were male, 48 (57%) female. The mean age of the patients was 53.6 years (range 17-91 years).

For the purpose of the audit the results have been divided into two sections for those patients who received general anaesthesia or conscious sedation.

**General anaesthesia**

**Subjects**

A total of 58 patients (69%) received general anaesthesia, for their dental treatment. The mean age was 42 years (range 17 to 91 years).

**Medical condition and impairment**

Twenty two patients (38%) presented with a medical condition, the range of these conditions is illustrated in Table 1. Fifty six patients (96.5%) had some form of impairment necessitating management under general anaesthetic. The range of impairments can be seen in Figure 1.

**GA Induction and maintenance**

The majority of patients, 38 (65.5%), were given propofol intravenously as the induction agent, 5 (8.5%) patients received gaseous induction with sevoflurane or isoflurane and in 15(26%) a combination of intravenous and inhalation agents was used. Muscle relaxants were used in all cases and intubation was carried out using a nasal tube in 42 (72%) patients and an oral tube in 16 (28%) patients.

**Post-operative period**

In the post-operative period, whilst on the recovery ward, analgesics were administered to 38 patients (65.5%) and antiemetics to 4 patients (7%).

**Special concerns regarding the general anaesthetic**

During the induction phase few concerns were reported. Difficulty with the intubation was reported in 5 (9%) cases, with one patient demonstrating very poor co-operation. No concerns were reported during the treatment phase in any patients. In the post-operative phase, 4 (7%) patients vomited and one patient, due to extended recovery and respiratory complications, was admitted for overnight stay.

**Dental treatment**

The category of care being provided was described as ‘Non-urgent’ or ‘Urgent’. Thirty-eight patients (66%) were managed as non-urgent cases, 20 (34%) as urgent. Of those treated on a non-urgent basis the mean time on the waiting list was 35 weeks (range 20–68 weeks). Patients managed as urgent cases had been waiting an average of 7 weeks (range 1–28 weeks).

The treatment carried out included restorations, extractions and prophylaxis. At the pre-operative assessment appointment a prediction was made as to what treatment was required for each patient, where this was possible. For

**Table 1. Medical conditions reported for those patients receiving treatment under general anaesthesia**

<table>
<thead>
<tr>
<th>Medical condition</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epilepsy</td>
<td>7</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>5</td>
</tr>
<tr>
<td>Obesity</td>
<td>3</td>
</tr>
<tr>
<td>Endocrine disease</td>
<td>2</td>
</tr>
<tr>
<td>Respiratory disease</td>
<td>1</td>
</tr>
<tr>
<td>Endocrine disease &amp; epilepsy</td>
<td>1</td>
</tr>
<tr>
<td>Respiratory disease &amp; epilepsy</td>
<td>1</td>
</tr>
<tr>
<td>Previous stroke</td>
<td>1</td>
</tr>
<tr>
<td>Psychiatric illness</td>
<td>1</td>
</tr>
</tbody>
</table>

Peri-operative analgesia was administered to 55 (95%) patients with the most commonly used drug being fentanyl in 46 (79%) patients.
Table 2. Medical conditions reported for those patients receiving treatment under conscious sedation

<table>
<thead>
<tr>
<th>Medical conditions</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular disease</td>
<td>13</td>
</tr>
<tr>
<td>Respiratory disease</td>
<td>2</td>
</tr>
<tr>
<td>Cardiovascular &amp; respiratory</td>
<td>1</td>
</tr>
<tr>
<td>Cardiovascular &amp; epilepsy</td>
<td>1</td>
</tr>
<tr>
<td>Cardiovascular &amp; obesity</td>
<td>1</td>
</tr>
<tr>
<td>Epilepsy only</td>
<td>2</td>
</tr>
<tr>
<td>Respiratory &amp; endocrine</td>
<td>2</td>
</tr>
<tr>
<td>Respiratory &amp; obesity</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 2. Change in treatment required in those requiring general anaesthesia

Figure 3. Percentage of patients treated under conscious sedation presenting with particular impairments

45 patients (78%) the actual treatment carried out was different to that predicted. These data have been broken down into those who needed extra fillings, a tooth to be extracted instead of being restored and additional extractions. The data are illustrated in Figure 2.

The average time range for the dental treatment to be carried out under general anaesthesia was 30–59 minutes for 15 patients (26%), 60–89 minutes for 20 patients (35%) and > 90 minutes in 21 (36%) cases.

Conscious Sedation

Subjects

A total of 26 patients (31%) received conscious sedation for their dental treatment. The mean age was 62.2 years (range 28 to 91 years).

Medical condition and impairment

Of the 26 patients, 8 (31%) had some form of impairment warranting the conscious sedation. The range of impairments can be seen in Table 2. Twenty-three patients (88.5%) presented with a medical condition, the range of conditions is illustrated in Figure 3.

Sedation drug and technique

Intravenous midazolam was used in the majority of patients, 92% (n=24). Propofol was used in 4% (n=1) and a combination of propofol and midazolam in 4% (n=1) of cases. Fentanyl was administered in 58% (n=15) of patients.

Post-operative period

In the post-operative period, whilst on the recovery ward, analgesics were administered to 9 patients (35%) and no patients received anti-emetics.

Special concerns regarding conscious sedation

There were no concerns reported during induction of sedation, the treatment phase or post-operatively, apart from one patient for whom the procedure was terminated because of non-cooperation.

Dental treatment

Twenty two (85%) patients were non-urgent cases and 4 (15%) were urgent. Of those treated on a non-urgent basis, the mean time on the waiting list was 37.5 weeks (range 12–88 weeks). Patients managed as urgent cases had been waiting an average of 6.25 weeks (range 1–12 weeks).

The treatment carried out included restorations, extractions and prophylaxis. For 9 patients (35%) the actual treatment carried out was different to that predicted at assessment. These data have been broken down into those who needed extra fillings, a tooth to be extracted instead of being restored and extra extractions. The data are illustrated in Figure 4.

The time range for the dental treatment to be carried out under conscious sedation was 15–29 minutes in 3 cases (11.5%), 30–59 minutes in 10 cases (38.5%), 60–89 minutes in 8 cases (31%) and > 90 minutes in 4 cases (15%). Treatment was discontinued in one case due to limited co-operation.

Patient/Carer Questionnaire

All 84 cases were contacted two days after their treatment and the patient/carer questionnaires for all patients were analysed together. Patients and carers were asked if they noticed any symptoms or changes in behaviour before the treatment such as, discomfort in the mouth or face, feeling unwell, difficulty swallowing or tooth grinding. Forty patients (48%) responded yes.

Those patients who answered yes were then asked to indicate if and when any positive changes were noticed.
including level of co-operation, degree of intellectual impairment, the patient's medical condition and the extent of dental treatment required.

The importance of carrying out a pre-operative medical and dental assessment where general anaesthesia or conscious sedation is being provided cannot be over emphasised. The assessment provides an opportunity to establish, where possible, the required dental treatment and the most appropriate method of pain and anxiety control, thereby reducing the risks of complications during and after treatment. (Hunter and Molinaro, 1997; Limeres-Posse et al, 2003; Association of Anaesthetists of Great Britain and Ireland, 2005).

For some patients who present with severe disabilities and limited co-operation, it is often difficult to formulate a detailed treatment plan at the assessment stage and a full oral examination under general anaesthesia is required (Hennequin et al, 2000). In the present study 50% of those receiving general anaesthesia had an intellectual impairment, consistent with a study carried out by Maestre et al, 1996 who reported that the need for general anaesthesia for dental care was markedly increased in patients with severe behavioural disturbance.

Prompt treatment is extremely important in order to maintain quality of life. Many patients with oral disease can exhibit changes in behaviour, sometimes showing signs of aggression and self-harming. In addition many patients with intellectual impairment find it difficult to communicate important information to relatives, carers and health professionals.

The standard waiting time from the initial assessment to the treatment visit for the audit should be a maximum of 24 weeks. Due to limited resources the waiting times at South Tyneside are longer than ideal and averaged between 35 and 37 weeks. It is probable that this in itself has led to a further deterioration in the dental status of the patients in question. Indeed, in 64% of all cases the actual dental treatment carried out was different and more invasive than that predicted. This can also be attributed to the fact that some patients did not have a full treatment plan pre-operatively and required a full dental examination under anaesthesia. The most common additional treatment modalities were restorations and extractions. In some cases where a tooth was deemed restorable at assessment, it became necessary to extract the tooth because of pulpal involvement or gross loss of tooth tissue.

Where additional treatment was required this may have resulted in an increased peri-operative time thus potentially increasing the risk of complications. Indeed, in 36% of patients receiving treatment under day-stay general anaesthesia, the peri-operative time was over 90 minutes greater than that set as the expected standard. This situation presents as a risk management issue, in that the general and oral health of the patient is being compromised.

It is understood that general anaesthesia does present a
greater risk than conscious sedation, which may have a significant effect on morbidity (Pike, 2000). However, following the treatment provided during the study period, few complications were reported and the prevalence of morbidity of 35% lies below the audit standard, with all cases being of a non-critical nature. This highlights the benefits of the pre-operative assessment and the importance of day-stay care with dedicated facilities and staff.

Satisfaction with day-stay dental care is a poorly researched area (Ennever et al., 2000). The evidence from this study indicates that the majority of patients were happy with the service provided and felt that the dental treatment received had greatly improved the general well being of many of the patients.

The results of the study are very promising, however it is important to highlight some limitations to the work. In attempting to obtain the views of patients/carers a phone call was made two days following the treatment. Recall of the visit and postoperative period may have been difficult for some respondents and a full understanding of the questions being asked cannot be assumed. Owing to the types of patients being cared for and the fact that some will have had other important medical and social issues, this may have led to cancelled appointments and patients failing to attend. Consequently a relatively small number of patients were included in the study. The results should therefore be treated with caution and can only provide an overview.

**Conclusion**

Patients with physical and/or intellectual impairment and those with medical problems should be the target of intensive monitoring and preventive efforts at both the clinical practice and public health levels. Although the morbidity rates in this study were low and below the standard set, if oral disease can be prevented or treated at an early stage, this may avoid the need for general anaesthesia or sedation and therefore reduce the risks to the patient.

Unless prompt treatment is provided the patient’s general well being may be compromised and it is therefore essential that providers of Special Care Dentistry and day-stay services address the issue of long waiting times with local Primary Care Trusts.

With the recognition by the General Dental Council of the need for a specialty in Special Care Dentistry, this field of oral care has gained national strategic importance. There now exists an opportunity for the Department of Health to place a high priority in developing a framework for service provision to people with a physical and or intellectual impairment and those who are medically compromised.

As a result of this audit, a business case has been submitted to South Tyneside Primary Care Trust proposing an increase in service provision for dental day-stay treatment. It is hoped that waiting times will decrease and as a result the care received by these patients will improve.

**References**


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