IN BRIEF

- The use of conscious sedation techniques for the management of the patient with dental anxiety showed considerable variation within a group of dental practitioners working in primary care.
- The majority felt there was a need for sedation in their own practice.
- Very few in the study group had received postgraduate training in sedation techniques.
- Sedation training must improve if conscious sedation is to become the principle alternative to general anaesthesia in dental practice.

The way forward for dental sedation and primary care?

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Objectives Firstly to determine the current provision of sedation in primary dental care in an area of Scotland without local secondary care support and secondly, to investigate dental practitioners' desire for formal postgraduate training in sedation techniques.
Design A prospective postal questionnaire-based study.
Setting Grampian Primary Care NHS Trust, UK, 2001.
Subjects Questionnaires were sent to all NHS dental practitioners and community dental service clinicians [N=194] employed through Grampian Primary Care NHS Trust, Scotland during March – April 2001. The questionnaires sought details about personal status and the use and perceived need for conscious sedation techniques in practice in addition to the stated desire for postgraduate training in sedation techniques.
Results One hundred and thirty-six questionnaires were returned (70%). Forty-nine per cent of respondents reported current sedation use, with intravenous sedation the favoured technique (82%), followed by oral sedation (33%) and inhalation sedation (19%). Seventy-four per cent of participants considered that there was a need for sedation in their own practice and 68% were interested in further postgraduate training in sedation techniques.
Conclusion Nearly three-quarters of practitioners who responded felt that there was a need for sedation in their own practice, although less than half were able to offer sedation to their patients. Nearly 70% of practitioners felt there was a need for postgraduate training in sedation techniques.

Anxiety about dental treatment is a recognised problem; in the most recent *UK Adult Dental Health Survey*, one half of all dentate adults claimed that they were irregular attenders at their dentist, and that the principal barrier to regular dental care reported by more than half of those 'irregular' attenders was fear of dental treatment.[1] Specifically, several studies have shown that fear of the 'drill' is the main cause of dental anxiety among both children[2–4] and adults.[5–7] Conscious sedation is an ideal tool for managing patients with dental anxiety who require dental treatment and studies have shown that when administered by either the oral, intravenous or inhalation route, the technique is both safe and effective.[8,9] The publication in July 2000 of *A Conscious Decision*, a report by a group chaired by the Chief Medial Officer and Chief Dental Officer of England (subsequently accepted by the British Government), has further endorsed the need for conscious sedation as a method of anxiety management.[10] This report recommended appropriate undergraduate and postgraduate training in sedation techniques; a view held by the Royal Colleges, the General Dental Council and the specialist societies.[11–16] As such, the present study was designed to determine: firstly, the current use of conscious sedation in primary dental care in an area of Scotland without local secondary care support and secondly, dental practitioners' desire for postgraduate training in conscious sedation techniques.

METHODS

The study was designed as a prospective, questionnaire-based survey, undertaken during March – April 2001.

Questionnaire design

The questionnaire sought information from all dental practitioners employed through Grampian Primary Care NHS Trust and working in either the General Dental Services (GDS) or Community Dental Services (CDS). Grampian Primary Care NHS Trust is an area without access to a secondary dental referral centre. Questionnaires sought details about personal status, the use and perceived need for conscious sedation techniques in practice, and to the stated desire for further training in sedation techniques. The questions are summarised as follows:

Practitioner details

- What sex and age band are you?
- What sector of primary care do you work in?
- What qualifications do you have?
- Do you have a qualification specific to sedation?
- Are you on any of the General Dental Council's Specialist Registers?

Sedation in your practice

- Do you use sedation in your practice?
- How many patients on average do you see and treat each week using sedation?
- What routes of administration of sedation do you use?

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- What sedative agents do you commonly use?
- What monitoring do you undertake during sedation?
- What equipment is available in the event of an 'emergency' during dental treatment using conscious sedation?

Your thoughts on sedation
- Is there a need for sedation in your practice?
- Where should sedation services be based?
- Would you consider further postgraduate training in sedation techniques?

A questionnaire, accompanied by an explanatory letter was sent to each of 194 dental practitioners and community dental service clinicians (GDS: 172; CDS: 22).

Table 1 Postgraduate qualifications of responding dentists

Postgraduate degree/diploma	Number of respondents
DGDP	5
MGDS	1
MSc	3
PhD	1
MOrth	2
FDS/MFDS	1
Dip Cons Sed	1
None	122
Total	**136**

RESULTS

Questionnaires were returned by 136 dentists (F: 56; M: 80); a 70% response rate, of whom 120 worked in the GDS (70% response) and 16 worked in the CDS (73% response). Questionnaires were returned from all age bands, with the age band 31+ being particularly well represented. In relation to qualifications, relatively low numbers had any postgraduate qualifications and most importantly, only one practitioner held a postgraduate diploma in conscious sedation. A further six respondents, however, had received training in sedation techniques through postgraduate courses. Only two of the dentists who returned a questionnaire were on a General Dental Council Specialist Register (Orthodontics) (Table 1).

When asked about sedation in their own practice, 100 dentists (74%) felt the need for sedation in their own practice, although only 67 practitioners (49%) offered sedation services. Of the practices that offered sedation for dental treatment, the majority treated an average of two patients each week using the assistance of pharmacological agents. Exceptions included one practice restricted to sedation and anaesthetic use which treated 36 patients per week and another two practices which treated between 10–12 patients per week. By far the commonest method of sedation was intravenous (82%), followed by oral sedation (with either temazepam or diazepam immediately prior to treatment) and nitrous oxide inhalation sedation (Fig. 1). The most common sedation agent used for intravenous sedation was midazolam, used by 52 (95%) respondents. Some sedationists, however, used both midazolam and diazepam (on separate occasions) and one sedationist was using propofol routinely (Fig. 2).

Concerning the monitoring of sedation patients, although 98% of practitioners administering intravenous sedation used a pulse oximeter (two dentists also did so when using inhalation sedation), far fewer numbers monitored the patient's blood pressure, or used an ECG during treatment (note: ECG monitoring is not currently a legal requirement for dental sedation) (Fig. 3). Indeed, 20 practices using sedation had no means of monitoring blood pressure. In addition to facilities for monitoring patients' pulse and blood pressure, the majority of practices had both suction and supplemental oxygen. Exceptions included one practice using intravenous sedation which appeared to have no suction; another had no supplemental oxygen, whilst a further practice had neither suction nor oxygen (the same practice also used oral sedation). One practice carrying out inhalation sedation had neither suction nor oxygen and one practice using oral sedation had no supplemental oxygen.

When asked if there was a need for sedation in their own practice, 100 (74%) practitioners thought that there was a need. Regarding where sedation should be undertaken, respondents chose one or more options, with the most popular being 'specialist centres' (66%) whilst 61% thought sedation should be undertaken in the GDS and 43% thought that sedation should be undertaken in both the CDS and the Hospital Dental Services. Practitioners were also asked about their own need for further postgraduate training in sedation techniques, with 93 (68%) respondents expressing an interest in further formal sedation training.

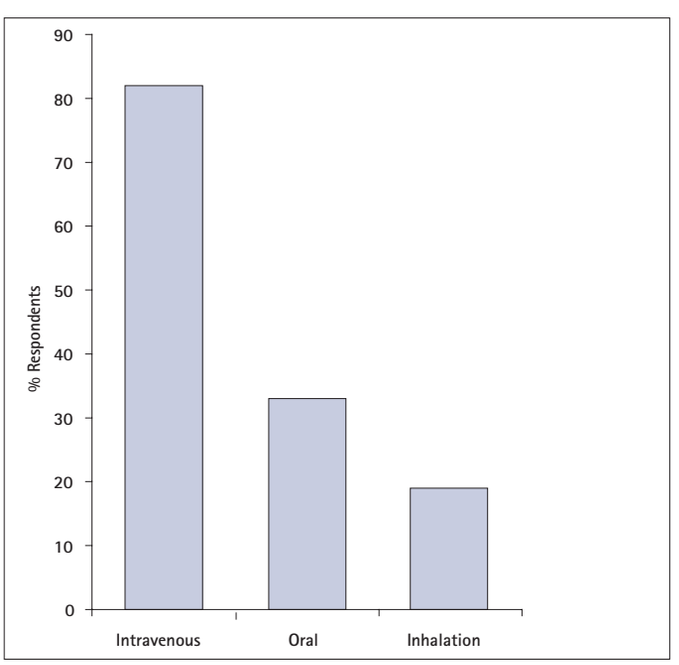

Figure 1 Method of sedation used in practices offering this technique

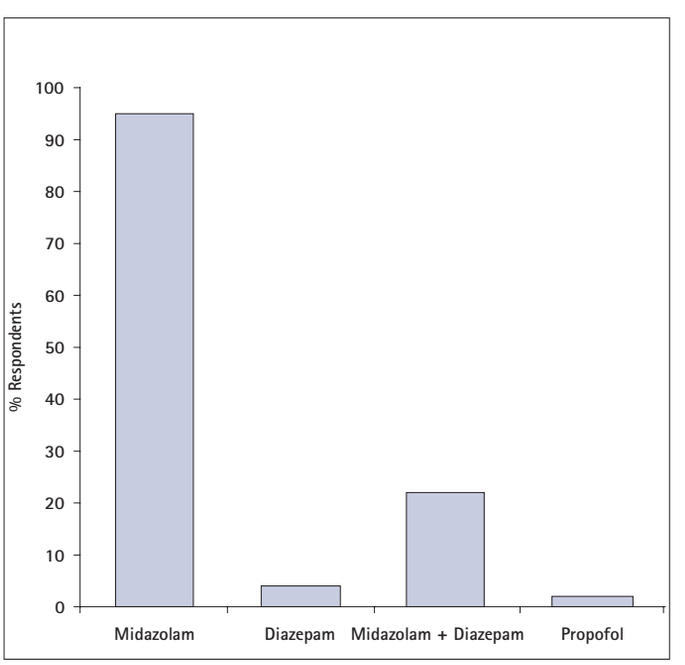

Figure 2 Sedation agent used for intravenous sedation in responding practices

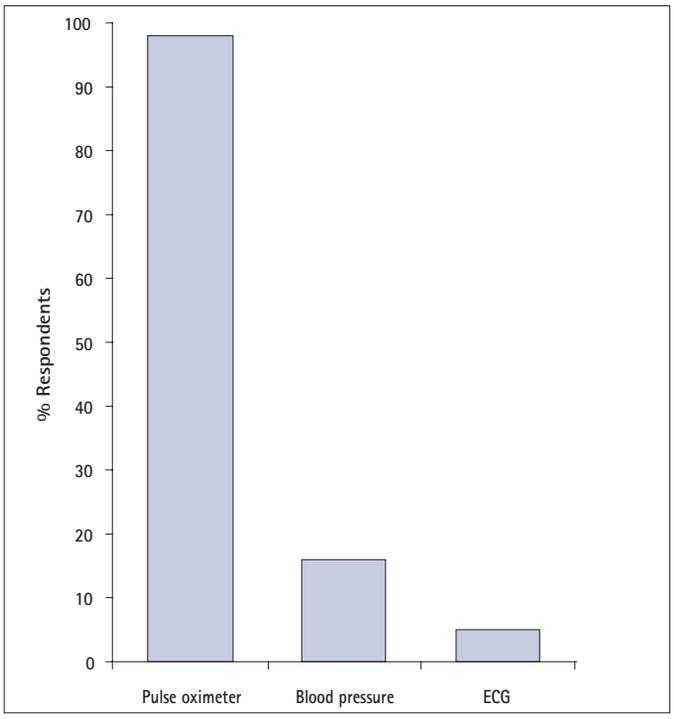

Figure 3 The monitoring of sedation patients

DISCUSSION

The response rate of 70% obtained for this questionnaire survey was acceptable, with a similar response rate from practitioners working in both the GDS and CDS. Although the sample size was relatively small, the results appeared to give a reasonable representation of the current views on the use of conscious sedation and the response appeared to be a valid indication of the use and need for sedation in practice. In particular, it highlighted the increasing use of conscious sedation techniques in dentistry, particularly in light of recent recommendations from the Department of Health and the General Dental Council.[10,11] Previous authors have investigated trends in the provision of primary care dental general anaesthesia (DGA) and sedation in the General Dental Service and Community Dental Service following the revised guidance from the General Dental Council. The findings indicated a substantial reduction in the numbers of DGA: by 75% between the first quarter of 1997/98 and the first quarter of 1999/2000, with the number of sedations increasing fourfold during the same time period.[17]

Of the respondents, only a relatively small number (14) held some form of higher degree and indeed, only one dentist had a Diploma in conscious sedation in dentistry, awarded from the University of Newcastle upon Tyne; one of only a few higher education institutions currently offering a formal postgraduate training in conscious sedation (designed in response to the need for and the demand by practitioners for formal training in conscious sedation techniques). A further six dentists had received further training, either through Section 63 courses or through the Society for the Advancement of Anaesthesia in Dentistry. Concerning registration on the General Dental Council's Specialist Register, only two of the dentists who responded were on any of the General Dental Council's Specialist Lists, both of whom were in orthodontics, a specialty not normally associated with management of the dentally anxious patient.

Regarding the use of sedation in practice, just under half of the dental practitioners who replied were able to offer a sedation service in their own practice, despite nearly three-quarters of practitioners declaring there was a need for some form of sedation service in their daily practice. Of the practices that offered sedation, on average only two patients per week were treated with the assistance of a pharmacological agent, excluding three practices which had a particular interest in conscious sedation. It could be anticipated that with recent changes in guidance from the General Dental Council and the publication of *A Conscious Decision*, that with the demise of DGA from the non-hospital setting, there will be an increased need for conscious sedation in dentistry.[10,11]

Intravenous sedation was the commonest method of sedation, with midazolam being the sedative agent most often used. This was followed by oral sedation with either temazepam or diazepam, then nitrous oxide inhalation sedation. The limited use of nitrous oxide inhalation sedation, with less than 20% of respondents offering inhalation sedation services (the majority within the CDS), is perhaps not surprising considering the substantial capital and operational costs associated with installing and running inhalation sedation equipment. Nitrous oxide inhalation sedation is a reliable, efficient and safe adjunct to local anaesthesia in adults undergoing minor oral surgical procedures.[18] In children, nitrous oxide inhalation sedation has been found to be a particularly effective method for facilitating orthodontic dental extractions and minor oral surgical procedures.[8,19,20] Furthermore, when comparing previous experiences of dental treatment under general anaesthesia, the majority of children (80%) preferred inhalation sedation[19] and showed less post-operative psychological distress.[21]

Regarding the monitoring of patients undergoing conscious sedation, the majority of respondents administering intravenous sedation used a pulse oximeter (98%). Substantially less, however, monitored blood pressure and a small minority had neither supplemental oxygen nor suction available. The General Dental Council in *Maintaining standards: Guidance to dentists on professional and personal conduct* has stipulated that all premises where dental treatment takes place should have available and in working order: portable suction apparatus to clear the oropharynx, oral airways to maintain the natural airway, equipment to provide intermittent positive pressure ventilation of the lungs, and a source of portable oxygen.[11] As such, those practices without supplemental oxygen and suction may be liable for a charge of serious professional misconduct. Regarding intravenous sedation, in nearly 78% of cases, no facilities were available for recording blood pressure. An important part of the pre-operative assessment for patients undergoing intravenous sedation is to record the patient's blood pressure.[22] One dentist did not use a pulse oximeter during treatment with intravenous sedation, despite the fact that the respiratory depressant effect of the benzodiazepines makes it imperative that the patient is continuously monitored with a pulse oximeter to enable early detection of hypoxia.[22] An expert working group has stated that monitoring for intravenous sedation must include the proper use of pulse oximetry and blood pressure.[16]

As regards the provision of sedation services, the results would indicate a real need for sedation services in the primary care setting and the need for further formal postgraduate training in sedation techniques. Two-thirds of the respondents suggested that sedation services should be based within 'specialist centres' and although these might not be feasible in the short-term, the General Dental Service, in addition to both the Community and Hospital setting were alternative choices.

Finally concerning sedation training, 70% of dentists working in primary dental care were interested in formal postgraduate training in sedation techniques. Education of dentists in the use of conscious sedation is currently undertaken at both undergraduate and postgraduate levels.

Although postgraduate training is mandatory before a dentist can practice sedation, the undergraduate curriculum is expected to provide a thorough introduction to the subject.[23–25] A recent questionnaire survey, however, has demonstrated inadequacies in undergraduate training. This study, designed to investigate the quantity and quality of conscious sedation teaching amongst final

year dental undergraduates at all 16 dental schools in the United Kingdom and Ireland, found considerable variation across the dental schools surveyed. Indeed, at most schools, students gained little or no hands-on experience in sedation, especially in intravenous sedation techniques. As such, the authors recommended that undergraduate sedation education must improve if conscious sedation is to become the principal alternative to general anaesthesia for managing patients with dental anxiety.[26] A national survey commissioned by the UK Department of Health, which addressed how undergraduate education prepared new graduates for their first year of general practice, revealed that new graduates felt inadequately prepared in the field of sedation.[27]

CONCLUSION

The use of conscious sedation techniques shows considerable variation across the profession in primary care. Nearly three-quarters of practitioners questioned felt that there was a need for sedation in their own practice, although less than half were able to offer sedation to their patients. Nearly 70% of practitioners felt there was a need for further training in sedation techniques. Indeed, the provision of postgraduate education and training in sedation must be provided if conscious sedation is to become the principal alternative to general anaesthesia for managing patients with dental anxiety in dental practice.

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