IN BRIEF

- Highlights the differences in conscious sedation training received by Specialist Registrars in restorative dentistry in the UK.
- Indicates the patient groups and types of restorative dentistry treatment provided under conscious sedation during the restorative dentistry training programme.
- Highlights the future intentions of restorative dentistry trainees in employing conscious sedation to facilitate restorative dentistry treatment.
- Indicates Specialist Registrars' views on sedation training needs during the restorative dentistry programme.

Conscious sedation training received by specialist registrars in restorative dentistry in the UK: a survey

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Objective To investigate conscious sedation training received by Specialist Registrars in Restorative Dentistry (SpRs) during their training programme. **Design** Postal questionnaire survey in the UK. **Setting** SpRs and recently certificated Consultants in Restorative Dentistry (CRDs). **Method** A questionnaire was sent to 81 current SpRs in Restorative Dentistry and CRDs who had been awarded a Certificate of Completion of Specialist Training within the previous three years. One follow-up letter was sent to non-responders. **Results** The completed questionnaire was returned by 67 (83%) SpRs and CRDs. Analysis revealed that 44 (69%) respondents had received conscious sedation training during their specialist training programme and that 50 (78%) respondents carried out restorative dental treatment under sedation during their programme. Thirteen (20%) respondents had not received conscious sedation training in their programmes but eight (13%) SpRs indicated that sedation training was planned. Training experiences differed throughout the UK: 29 (66%) respondents gained experience in inhalational and single agent intravenous sedation techniques under the supervision of an experienced colleague. Fourteen (32%) respondents who performed sedation had not been on a resuscitation course in the previous year. These included nine (21%) current SpRs. Sixteen (53%) current SpRs intended to offer restorative dental treatment under sedation after specialist training. Fifty-nine (92%) respondents thought that all SpRs in Restorative Dentistry should receive sedation training and 42 (71%) thought that a structured core course would be the most appropriate format. **Conclusions** Although the majority of SpRs and recently certificated CRDs considered that all SpRs should receive training in conscious sedation via a core course during the restorative dentistry training programme, a small number had not received or planned to undertake such training. Conscious sedation training experiences differed throughout the UK and SpRs treated a wide range of deserving patient categories under sedation. It is encouraging that many SpRs hope to continue employing sedation techniques after their restorative dentistry training has finished. The results of this survey should inform all those involved with restorative dentistry training programmes.

INTRODUCTION

Severe anxiety is one of the major reasons for provision of conscious sedation for dental treatment. Such anxiety is still a significant problem in dentistry: the results of the 1998 Adult Dental Health Survey¹ showed that one third of the UK adult population experience anxiety about going to the dentist, rising to nearly half of irregular attendees. Sedation can also be useful for patients undergoing complex or unpleasant operative procedures, for those patients whose medical condition may be exacerbated by stress, for those with involuntary movement disorders, physical

or learning difficulties, and for those with strong gag reflexes.

It has been shown that the main difficulty facing patients who require conscious sedation for specialist restorative dental care is the lack of availability of secondary care.² Most CRDs work within guidelines as to which clinical conditions can be treated within the secondary care service at hospitals or community clinics. A pilot Index of Restorative Dentistry Treatment Need (IRDITN) has been suggested to identify and rank treatment complexity³ and when this index was applied to restorative dentistry referrals at a dental

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Refereed Paper

Accepted 9 March 2006

DOI: 10.1038/sj.bdj.4814044

© British Dental Journal 2006; 201: 373–377

Fig. 1 Extent of sedation training received (n = 44)

Fig. 2 Resuscitation courses undertaken in previous 12 months (n = 44)

teaching hospital and a district general hospital, 21% and 16% respectively were judged to require secondary dental care.⁴ The index is modified in the presence of such factors as a medical history that affects clinical management, special needs for the acceptance or provision of dental treatment, or the presence of a retching tendency.

Morgan and Skelly⁵ assessed the views of CRDs on sedation services in secondary care for restorative dentistry. The majority of CRDs (94%) thought that SpRs in restorative dentistry should undergo some form of training in sedation. Since 2002, the latter's training programme now includes a requirement to record the number of cases treated under inhalational and intravenous sedation in their training Log Book, but the amount and nature of training is not specified.⁶

The aim of this study was to investigate the level of conscious sedation training received by SpRs and recently certificated CRDs in restorative dentistry in the United Kingdom.

METHOD AND MATERIALS

A questionnaire was mailed to all current NHS and Honorary SpRs in the United Kingdom, and to those NHS and Honorary CRDs who had been awarded the Certificate of Completion of Specialist Training within the previous three years. Their names were identified from a search of the website of the Specialist Registrars in Restorative Dentistry Group (www.srrdg@derweb.co.uk) and the General Dental Council's Specialist List for Restorative Dentistry (www.gdc-uk.org). The names were then cross-referenced with the database of the Specialist Advisory Committee (SAC) in Restorative Dentistry.

The questionnaire was in four parts. Part 1, containing six questions, was designed to give the profile of the respondents. Part 2, containing 16 questions, was designed to obtain information about the training in conscious sedation that the respondents had received. Part 3, containing five questions, was designed to obtain information about the treatment under sedation that the respondents had undertaken. Part 4,

containing six questions, was designed to obtain information about the respondents' views on sedation training needs. The questionnaire was piloted among SpRs and CRDs at Guy's and St Thomas' Foundation Trust after which minor changes were made.

In April 2004 the questionnaire was sent by post to the 81 SpRs and CDRs identified and was coded to identify non-responders. A cover letter explaining the aims and nature of the survey was included as was a stamped, addressed, white envelope. After four weeks, non-responders were sent the questionnaire again. After a further four weeks, the survey period was closed and identifier codes destroyed.

The returned questionnaires were assessed for completeness and the responses numerically coded and grouped if required. The results were entered onto an Excel spreadsheet and analysed using Stata 8 Data Analysis software (Stata Corporation, Tx 77845, USA).

RESULTS

A total of 81 questionnaires were sent; 59 were returned after the first mailing and a further eight were returned after the second mailing. The total received, 67, represented a response rate of 83%. Of the 67, three were discarded as incomplete leaving 64 to be analysed.

Profile of respondents

The 64 respondents comprised 25 NHS SpRs (39%), 14 Honorary SpRs (22%), 16 NHS CRDs (25%), and nine Honorary CRDs (14%). Twenty-eight (44%) respondents had graduated with their primary dental degree between 1991-1995, 15 (23%) respondents had graduated between 1986-1990, and 12 (19%) had graduated between 1996-2000. The remaining seven respondents had graduated prior to 1985.

Eleven SpRs (28%) were in year 4 of training, nine (23%) were in year 3, seven (18%) were in year 2, and seven (18%) were in year 1. Four SpRs (10%) were in year 5 and one SpR (3%) had been in training for more than six years. Thirteen (52%) CRDs had been in training for four to five years, nine (36%) had been in training for five to six years, two (8%) had been in training for three to four years and one (4%) had been in training for more than six years.

Twenty-one respondents (32%) had received their training in the London Deanery, 10 respondents (16%) were trained in Scotland, nine respondents (14%) were trained in the Northwest Deanery and seven (11%) were trained in the Northern Deanery. The remaining 17 respondents (27%) were trained in the West Midlands, Yorkshire, Trent, Southwest, Wales and Northern Ireland Deaneries.

Conscious sedation training

Forty-one respondents (64%) had received conscious sedation training during their undergraduate education. Such training consisted of theory with some practical experience of inhalational or intravenous techniques for most individuals. However, 11 NHS SpRs (17%), six Honorary SpRs (9%), four NHS CRDs (6%) and two Honorary CRDs (3%) reported that they had not undertaken sedation training at that time.

Forty-four respondents (69%) received conscious sedation training during their specialist-training programme. Of these 44, 25 (57%) received the training during years 3-4 of training but for 11 (25%) SpRs, the sedation instruction was during years 1-2 and for eight (18%) this was during the final year of training. Of the SpRs who had responded negatively, 13 (20%) had not yet received any training in sedation in their programme. It is of note that eight (13%) SpRs indicated that sedation training was planned but not yet started. Seven (11%) had been trained in sedation prior to starting their restorative dentistry training programme.

Figure 1 shows the type of sedation training received by the 44 respondents who responded positively. Twenty-nine (66%) were taught by an experienced colleague, with some supplementation by a Section 63 or SAAD course (Society for the Advancement of Anaesthesia in Dentistry). Practical instruction in inhalational and single-agent intravenous techniques was received by the majority (26; 59%) while others (13; 30%) were instructed in advanced methods. Nineteen SpRs (43%) performed sedation at least monthly but nine SpRs (21%) and 10 CRDs (23%) performed sedation only occasionally or rarely during their training programme.

The majority of respondents sedated one (12; 27%) or two (25; 57%) patients per clinical session. Most (40; 91%) acted as operator-sedationists. Trained dental nurses acted as the second appropriate person for the majority of the respondents (23, 53%) while 18 (40%) worked with a combination of trained dental nurses, dentists or anaesthetists depending upon the sedation session and the clinic location. The remainder were assisted by dental nurses who were untrained in sedation.

Figure 2 shows the numbers of respondents who attended a course on Basic Life Support (BLS), Intermediate Life Support (ILS), or Advanced Life Support (ALS) within the previous year. Twenty-four (55%) respondents undertook BLS training while 14 (32%) had no resuscitation training update. This included nine (21%) current SpRs.

There were no significant differences in the type of sedation training when the

Fisher's exact test was used to compare the four groups: NHS SpRs, Honorary SpRs, NHS CRDs and Honorary CRDs.

Restorative dental treatment under sedation

Most SpRs and CRDs (50; 78%) have provided restorative dentistry treatment under sedation during their training. Figure 3 shows the range of treatment carried out by the 50 positive respondents. Sedation was more likely to have been provided for implant and advanced endodontic treatment (molar RCT and peri-radicular surgery) than other specialist restorative dental procedures (crown and bridge, advanced periodontal treatment). Most treatment performed comprised of basic procedures (conservation, simple periodontal treatment and dentures) and basic endodontics (anterior and premolar RCT).

Respondents performed restorative dental treatment under both inhalational and intravenous sedation but not oral or advanced sedation. The largest single group of patients treated by SpRs and CRDs was the moderate to severely anxious (Fig. 4). SpRs also treated the mildly anxious, disabled patients, medically compromised patients, and patients with strong gag reflexes. CRDs appeared to treat these groups less frequently during training. The majority of NHS SpRs (14; 74%) indicated that they would continue to offer treatment under sedation whereas the majority of Honorary SpRs (nine; 82%) would not. Conversely, the majority of Honorary CRDs (six; 75%) do offer treatment under sedation, whereas the majority of NHS CRDs (seven; 58%) do not.

There were no significant differences in restorative dental treatment carried out when the Fisher's exact test was used to compare the four groups: NHS SpRs, Honorary SpRs, NHS CRDs and Honorary CRDs.

Sedation training needs

The majority of respondents (59; 92%) supported the concept of conscious sedation training for all SpRs in Restorative Dentistry. The 8% who did not support the concept indicated that sedation specialists, GDPs with a special interest in sedation, or anaesthetists should perform sedation.

Fifty-eight respondents (98%) indicated that oral, inhalational and intravenous theoretical and practical components should be taught to SpRs in Restorative Dentistry. There was almost no support for training in advanced sedation techniques.

Forty-two respondents (71%) supported the concept of a core course in conscious sedation for SpRs with a mean suggested number of clinical sessions of 13. A clinical attachment in an appropriate unit was supported by 22 respondents (37%) and attendance at a SAAD course was supported by 10 respondents (17%). Five respondents (9%) supported a Diploma in Conscious Sedation or a theory-only course. There was no support for attendance at a Section 63 course or equivalent.

There were no significant differences in the opinions of the four groups, NHS SpRs, Honorary SpRs, NHS CRDs and Honorary CRDs concerning sedation training needs when the Fisher's exact test was used.

DISCUSSION

This cross-sectional national survey of SpRs and recently certificated CRDs investigated conscious sedation training during their restorative dentistry training programme. The purpose was to determine the extent of sedation training received following changes in the training programme requirements and the results of a survey of Consultants in Restorative Dentistry.⁵

The response rate of 83% conformed to accepted standards⁷ and was

Fig. 3 Treatment performed under sedation by SpRs (n = 50)

Fig. 4 Type of patient treated under sedation by SpRs (n = 50)

comparable to a recent national survey of SpRs in dentistry in the UK.⁸ The non-responders, who were mainly Consultants, may not have completed the questionnaire because of lack of interest, local political or work-related pressures, perceived poor questionnaire design, or perceived inadequacies in their own conscious sedation training. The questionnaire was designed to conform to the recommendations of Williams *et al.*,⁹ that is, the questionnaire was piloted, the questions were short and specific, the questions were grouped and ordered according to the overall research objectives, and the general information was retrieved early. Clear instructions were given so that the questionnaire could be navigated easily and various colours and fonts were used to make the layout clear and attractive. Closed questions were asked with a tick box answer system so that responses could be coded to facilitate data analysis.

The Deanery distribution reflected the pattern of training provision with one third of respondents trained in London where there are several training programmes. Drugan *et al.*⁸ reported that most SpRs would like to settle in the region where they trained and that the majority preferred the London region as the most likely alternative. These results may have implications for restorative dentistry and conscious sedation service provision outside London where demonstrable patient need has been reported.^{4,5,10}

Not all of the current SpRs had received conscious sedation training as undergraduates. This is contrary to General Dental Council recommendations that 'All dental students must have a range of practical experience in the administration of inhalational and intravenous conscious sedation...'¹¹ Approximately 10% of current SpRs obtained their primary dental qualification overseas which may account for this.

The majority of respondents (69%) received conscious sedation training during the middle period of their restorative dentistry training programme but some received the training during years 1-2 (25%). Starting sedation training early may offer benefits as training can be spread over the five years and restorative dentistry skills can be mastered in the context of total patient care for those with complex medical histories, special needs or challenging behaviour. However, a case could be made for delaying sedation training until the middle of the programme: even basic dental treatment can be difficult in patients requiring sedation and so it would be advantageous to have well practised and efficient restorative dentistry skills prior to training in sedation.

Those current SpRs who replied that they received sedation training prior to taking up their SpR post commented that they had performed conscious sedation as Senior House Officers in Oral and Maxillofacial Units. The quality and quantity of such training generally is unknown. There are a number of guidance documents which cover the requirements that a competent sedationist should fulfil.¹²⁻¹⁴ Theoretical, practical and clinical training in each sedation modality performed must be completed before independent sedation practice is undertaken. It has been suggested that 10 inhalational episodes and 20 intravenous episodes should be the training standard.¹⁴

Thirteen (20%) respondents had not received conscious sedation training in their programmes. One (2%) of these individuals was a CRD and 12 (19%) were SpRs. This finding is in breach of SAC training programme requirements in Restorative Dentistry. Eight (13%) SpRs indicated that sedation training was planned.

The majority of respondents who

received sedation training received a theory course with practical experience in inhalational and intravenous techniques. A few had received instruction in advanced techniques. Most SpRs were taught by an experienced colleague, supplemented by a SAAD or Section 63 course. Only two trainees had completed a Diploma in Conscious Sedation. However, funds for such a course are not generally available within the normal study leave budget. Most SpRs had weekly or monthly patient sessions with some having the opportunity to practice clinical skills occasionally or rarely. In one instance, this was one sedation patient every six months. Clearly, such infrequent exposure would not be likely to produce competency in sedation.¹⁴

Operator-sedationist was the role performed by the vast majority of SpRs and thus a second appropriately trained person was mandatory. The value of trained dental nurses was highlighted in the survey. Some trainees had a combination of trained dental nurses, general dentists with a special interest in sedation, or anaesthetists as the second appropriate person.

An alarming number of respondents, including many current SpRs, had not completed a BLS course in the preceding year. Fourteen respondents (32%) had not attended any courses. Basic Life Support is mandatory for all health professionals and, in dentistry, the requirements are clearly set out by the General Dental Council.¹⁵

Surgical and non-surgical endodontics was performed under sedation by the majority of respondents (Fig. 3). Periradicular surgery was one treatment for which respondents would offer sedation to the mildly anxious patient and this was in agreement with the findings of Morgan and Skelly.⁵ Dental implant placement was also more likely to be performed under sedation than periodontal surgery or fixed prosthodontics. Morgan and Skelly⁵ have reported that multiple implant placement was more likely to indicate a need for conscious sedation than single implant placement.

Figure 4 shows the patient categories treated by respondents. The largest group was the moderate – severely anxious. However, there was no guidance given to respondents as to how they should classify the anxiety levels of their sedation patients. No information was sought as to the use of anxiety scoring questionnaires. Current SpRs had good experience of treating medically compromised patients, patients with disabilities, and patients with strong gag reflexes. This was probably a reflection of the logbook requirements but it is encouraging for these patient groups because future access to specialist restorative dentistry services under conscious

sedation may be facilitated by these training opportunities, particularly if the IRDTN is adopted. The SpRs appeared to receive less opportunity to treat the mentally ill and those with developmental problems. This may have been because these patients are probably more appropriately managed by sedationists with advanced skills.

The majority of current NHS SpRs expressed a desire to continue sedation practice after completion of specialist training but the majority of current Honorary SpRs did not, probably because of anticipated teaching or research commitments. However, of the CRDs who had received sedation training, a greater proportion of Honorary CRDs provided treatment under sedation than NHS CRDs. This difference may reflect subspecialty interest, differences in population treatment needs or the fact that Honorary CRDs are based in dental schools where sedationists are available.

The majority of respondents (59; 92%) supported the concept of conscious sedation training for SpRs in restorative dentistry. This figure is in agreement with the 95% reported from CRDs by Morgan and Skelly.⁵ A core course or clinical attachment with theory and practical instruction in basic techniques of inhalational and single-agent intravenous sedation was the preferred option. There was no support for training in advanced techniques which are best provided by experts in dental sedation or anaesthetists. Interestingly, a recent survey¹⁶ of anaesthetists in Scotland found that a significant number disagreed with the practice of operator-sedationist and thought that dentists should not be administering even the simplest forms of sedation.

However, the majority of these respondents felt that it was unrealistic for anaesthetists to provide all dental sedation.

An SpR core course should amount to 13 sessions with two patients per session. Emphasis should be placed on the influence of conscious sedation on the restorative dental management of patients. Patient centred treatment planning and assessment in multidisciplinary teams should be facilitated. Such an approach should give adequate training and experience in the busy restorative dentistry training programme and will help to eliminate the differences in sedation training for SpRs throughout the UK, which have been highlighted by this survey.

CONCLUSIONS

Although the majority of SpRs and recently certificated CRDs considered that all SpRs should receive training in conscious sedation via a core course during the restorative dentistry training programme, a number had not received or planned to undertake such training. Conscious sedation training experiences differed throughout the UK and SpRs treated a wide range of deserving patient categories under sedation. It is encouraging that many SpRs hope to continue employing sedation techniques after their restorative dentistry training has finished. The results of this survey should inform all those involved with restorative dentistry training programmes.

We thank Dr R. Wilson for his help and advice and the Specialist Registrars and Consultants in Restorative Dentistry who took part in the survey.

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