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# Sedation and anaesthesia for transvaginal oocyte collection: an evaluation of practice in the UK

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**BACKGROUND: The objective of the survey was to evaluate sedation and anaesthetic practice employed for oocyte collection in the different assisted conception units in the UK and whether the guidelines of safe sedation were adhered to. METHODS: A survey was carried out by means of a postal questionnaire sent out to the 100 reproductive medicine units of the UK, and 67 of the units responded. RESULTS: A response rate of 67% was achieved. Seventy-seven percent of responding units were part of hospitals with resuscitation facilities; 23% were free-standing without an in-house resuscitation team. Intravenous sedation was the preferred method of sedation for oocyte collection, being used in 62.4% of units. General anaesthesia was the primary method in 24.6% of units. A total of 47.4% of units used a medical member of the reproductive medicine team for administering sedation; 69% of cases were performed in a facility within the unit. One-hundred percent of respondents had oxygen, suction and tilting trolleys. It was reported that 23% of units were free standing, without cover from a resuscitation team. Sedation was performed by non-anaesthetic doctors in 46% and by nurses in 8.2%. In 69%, collections were performed outside of a general operating theatre environment. Also, 4.8% of units had no resuscitation trolley and 21.4% no defibrillator. CONCLUSION: Though most units complied with the guidelines of safe sedation and anaesthesia, gaps have been observed in the safe provision of sedation services for women undergoing oocyte retrieval in some units.**

*Key words*: anaesthesia/conscious sedation/oocyte retrieval

## Introduction

Oocyte retrieval forms one of the most vital aspects of IVF. Great efforts have been made to make the procedure safe and as comfortable for the patient as possible. The replacement of laparoscopic retrieval by the transvaginal route under ultrasound guidance was a great step forward. The use of 'conscious sedation' as a means of pain control and anxiolysis, with or without local anaesthesia/paracervical block, reduces some of the risks associated with deep sedation or general anaesthesia. However, conscious sedation is still not without its hazards, and appropriate precautions must be taken to minimize risk.

In the huge volume of literature on assisted reproduction technology, there is a paucity of studies on the evaluation of the different methods of pain relief during oocyte retrieval. The ideal method of pain relief would be one that is (i) safe, providing adequate pain relief with minimal side effects and complications; (ii) easy to administer and monitor; (iii) short acting and easily reversible; and (iv) without deleterious effects on oocytes and embryos.

The primary concern of safety is governed by the type, number and quantity of drugs, the personnel administering them and monitoring the patients, and the kind of infrastructure available at the site of oocyte collection.

In November 2001, the Academy of Royal Colleges published a report on safe sedation practices on health care in adults. Previously published guidelines were reviewed and evidence of continued poor standards in sedation was discussed. Some general recommendations and new measures were proposed. The rationale for this report was a history of deaths during and after procedures under sedation typified by one survey of 14 000 endoscopic procedures that revealed a 30-day mortality of 1 in 2000 from cardio-respiratory problems (Bell *et al.*, 1991).

Is this topic important to workers in reproductive medicine? The patient population presenting for procedures under sedation in reproductive medicine is relatively young and healthy, and serious morbidity, let alone mortality, appears to be rare. However, just one critical incident due to sedation would be a disaster for all involved, and the consequences for the specialty far reaching. A previous survey (Elkington *et al.*, 2003) noted a great deal of variation in personnel present during the procedure, the use of drugs, the degree of monitoring and the availability of emergency drugs. Given the renewed focus on safe sedation, we aimed to produce a basic description of current practice and facilities used for sedation in UK reproductive medicine, and to assess the deficits highlighted in the earlier surveys from which further


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enquiries can be targeted and recommendations considered. We also wanted to evaluate the drugs that were being used for anaesthesia/sedation. Concentrations of the drugs have been demonstrated in the follicular fluid at the time of oocyte retrieval (Christiaen *et al.*, 1999; Ben Shlomo *et al.*, 2000).

## Materials and methods

A questionnaire (Appendix) was mailed to all 100 UK Reproductive Medicine Units listed with the Human Fertilization and Embryology Authority (HFEA), to be returned anonymously in a stamped addressed envelope. Sixty-seven replies were received.

## Results

Four questionnaires were excluded from analysis because the responding units did not perform oocyte retrievals.

Seventy-seven percent of responding units were part of a hospital with resuscitation facilities; 23% of the units responding were free-standing units without an in-house resuscitation team.

I.v. sedation was the preferred method of sedation for oocyte collection, being used in 62.4% of units. General anaesthesia was the primary method in 24.6% of units, 2.8% used either general or i.v. sedation, and another 5% combined i.v. sedation with a paracervical block. One respondent (1.6%) used spinal anaesthesia with i.v. sedation and 3.6% used i.m. analgesics with i.v. sedation.

Of those units using i.v. sedation, 39 out of the 46 (84.8%) employed a combination of two drugs, usually midazolam in combination with fentanyl, alfentanil, pethidine or propofol. More than two sedative drugs were used in 10.85% of units (Figure 1).

A total of 47.4% of units had a medical member of the reproductive medicine team administering sedation, sometimes working with a nurse or supervising a nurse; 44.4% used anaesthetists and 8.2% of units indicated that a nurse independently administered sedation (Figure 2). One unit did not respond to this question.

Most oocyte retrievals were performed within assisted conception units (69%). However, the remaining 31% were performed within an operating theatre complex. Two units used both places for their egg collections.

Units were asked if oxygen, suction, a tilting operating table, resuscitation trolley and a defibrillator were available

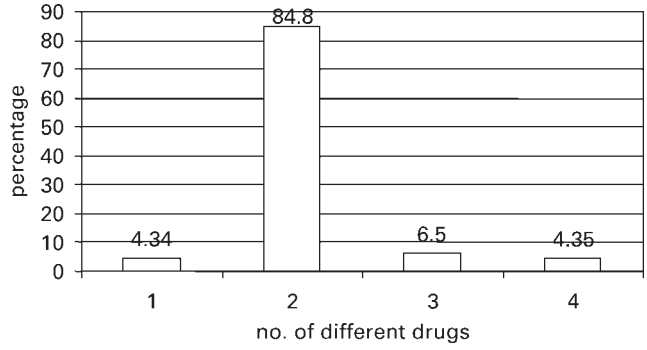


**Figure 1.** Number of different drugs preferred for i.v. sedation.

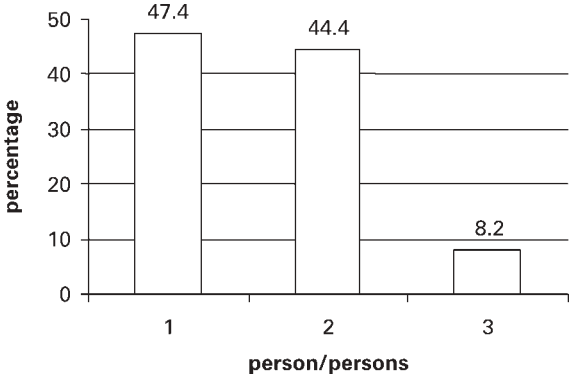


**Figure 2.** Person/persons performing anaesthesia/sedation: (1) medical member; (2) anaesthetist; (3) nurse.

to them at the site of oocyte collection. All units possessed oxygen, suction and a tilting operating table, with 78.6% having all five facilities. However, 4.8% had no resuscitation trolley and 21.4% had no defibrillator (Figure 3).

Units were asked if oxygen, suction and a tilting trolley were available for each patient in recovery, and if the attending nurses had formal recovery or resuscitation training. The results are shown in Figure 4 and indicate that 3.3% of units had none of these facilities.

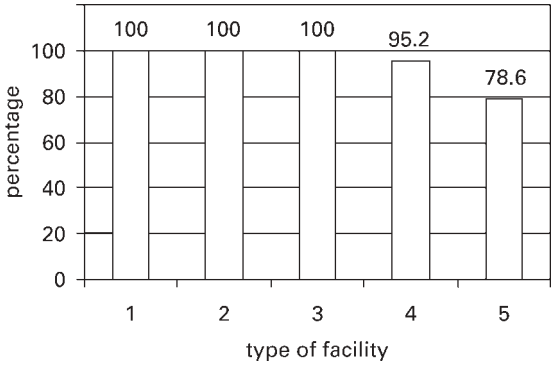


**Figure 3.** Type of facilty in the oocyte collection areas: (1) oxygen; (2) suction; (3) tilting operating table; (4) resuscitation trolley; (5) defibrillator.

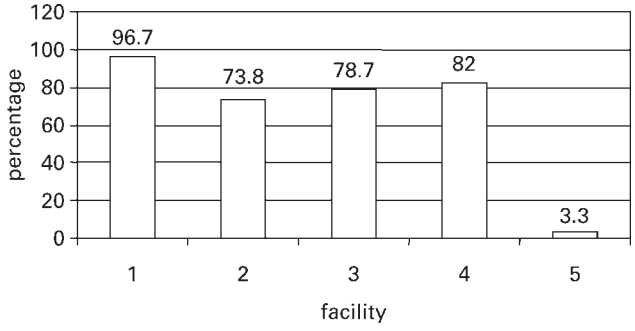


**Figure 4.** Type of facility in recovery area: (1) oxygen for every patient; (2) suction for every patient; (3) tilting bed or trolley; (4) nurse with formal recovery or resuscitation training; (5) no facility.

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## Discussion

Conscious sedation has gained acceptance in the short-term management of pain in the field of internal medicine and dentistry (Bell *et al.*, 1991; Quine *et al.*, 1995; Independent Expert Working Group, 2000) with well established guidelines. It has also evolved as a popular method of pain control for oocyte collection in IVF (Ben Shlomo *et al.*, 1992; Gohar *et al.*, 1993; Ditkoff *et al.*, 1997; Bokhari and Pollard, 1999). Trout *et al.* (1998) have strongly advocated the use of conscious sedation as it has so far proved appropriate in terms of safety as well as ease of administration. The present survey has revealed that the variability in use of sedation and anaesthesia and type of personnel administering it present during the earlier surveys (Bokhari and Pollard, 1999; Elkington *et al.*, 2003) still persists.

When these findings are compared with the practical recommendations in many of the published guidelines, it shows some obvious deficiencies. Free-standing units and those isolated from operating theatre departments may not have the in-house skill to deal with serious cardio-respiratory complications of sedation, unless anaesthetists are present. This is not always a practical or economically viable solution for many units, so existing staff, training and facilities need to be improved in some units. Formal training in sedation and resuscitation, the availability of appropriate equipment, and on-going audit of complications and compliance with protocols are vital. Even within hospitals where resuscitation staff are available, shortfalls in basic resuscitation equipment, particularly in the recovery area, cannot be treated with complacency.

The Intercollegiate Report on Safe Sedation Practice made several new recommendations, which include the following:

- Royal Colleges in association with the relevant subspecialty organizations should develop guidelines on sedation methods appropriate to clinical practice in the sphere of influence.
- Royal Colleges and their Faculties should incorporate necessary instruction and assessment into training and revalidation programmes of those specialties that use sedation techniques.
- The clinical governance framework should deliver safe sedation practice at hospital level by enabling a patient-centred culture in which:

  multidisciplinary team training ensures that all staff understand their roles;

  those who actually administer sedative drugs are aware of the possible adverse consequences and are able to deal with these; and

  audit of adverse incidence, complications (particularly severe ones such as admission to intensive care) and adherence to agreed national and local protocols promotes continuous quality improvement.
- Each hospital should nominate two consultants, one an anaesthetist and the other a user of sedation, to collaborate in the local implementation of guidelines and the provision of a specialist service for patients with particular problems.

The second issue governing mode of pain control is the effect of the agents used on outcome such as number of oocytes retrieved, fertilization and cleavage rates, and pregnancy outcome. Use of halothane and neuroleptic analgesia has been studied and deemed unfit for oocyte retrieval (Naito *et al.*, 1989). Use of general anaesthesia with $NO_2$ is also considered to have an adverse outcome leading to reduced pregnancy rates (Gonen *et al.*, 1995). During paracervical blocks, the concentrations of lidocaine found in follicular fluid have not revealed any detrimental effect on oocytes (Wikland *et al.*, 1990). A prospective randomized, placebo-controlled study by Ng *et al.* (1999) has observed lower abdominal pain scores without any negative effect on pregnancy rates when paracervical block with lignocaine is combined with i.v. sedation. The effect of propofol has been a matter of debate. Concentration of propofol has been demonstrated in the follicular fluid in a number of studies (Coetsiev *et al.*, 1992; Christiaen *et al.*, 1999; Ben-Shlomo *et al.*, 2000). Ben-Shlomo *et al.* (2000) found no difference in fertilization, cleavage and embryo cell number, while Vincent *et al.* (1995) demonstrated lower pregnancy rates with propofol than with isoflurane for laparoscopic embryo transfer. Ben-Shlomo *et al.* (1999) compared general anaesthesia with sedation and found a comparable number of oocytes retrieved and no difference in rate of embryo transfers and pregnancies. Studies of human and non-human oocytes have revealed no deleterious effects with the drugs generally used in conscious sedation such as fentanyl and midazolam (Bruce *et al.*, 1985; Swanson and Leavitt, 1992; Chopineau *et al.*, 1993). There remains the possibility that anaesthetic during oocyte retrieval can influence the results of IVF, and more studies are required in this field.

## Conclusion

Conscious sedation is an accepted mode of pain control during oocyte retrievals. Trout *et al.* (1998) strongly advocate the use of conscious sedation for oocyte retrieval taking into consideration its safety and ease of administration. Our survey has revealed a good level of facilities in reproductive medicine units that perform sedation, with some indication of deficiencies. Generally conscious sedation precludes the need for highly sophisticated and expensive equipment, but we suggest that, despite the probable lower level of risk compared with sedation in some other clinical areas, there is an urgent need to comply with the recommendations above. Once specific standards are published, and scrutiny takes place at the local level, small equipment shortfalls will be rapidly addressed. Training issues are more complicated and will require significant resources. The involvement of anaesthetists may also not be straight forward, in that the majority have no experience or current input into reproductive medicine.

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## Appendix. The questionnaire

1. Is your unit free-standing, without an in-house resuscitation team YES/NO
2. Is your unit part of a hospital with resuscitation facilities YES/NO
3. What is your *routine, principal method* of increasing comfort during egg collection?
   (i) General anaesthesia
   (ii) Oral or intramuscular sedatives and analgesics
   (iii) Intravenous sedation
   (iv) Local anaesthetic techniques such as spinal anaesthesia
   (v) Other (please specify)
4. If answered (ii) or (iii), which are the drugs employed
   (i)
   (ii)
   (iii)
   (iv)
5. Who usually performs the technique in question 3?
   (i) A medical member of the infertility team
   (ii) A nurse
   (iii) An anaesthetist
   (iv) Other (please specify)
6. Where are your egg collections performed?
   (i) An operating theatre within a larger theatre block
   (ii) In a facility within the assisted conception unit
7. If you ticked (ii) for the last question, which of the following facilities are available
   (i) Oxygen
   (ii) Suction
   (iii) A tilting operating table
   (iv) A resuscitation trolley
   (v) A defibrillator
8. In the recovery area, which of the following criteria are satisfied?
   (i) Oxygen available for every patient
   (ii) Suction available for every patient
   (iii) A tilting bed or trolley
   (iv) A nurse with formal recovery or resuscitation training

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