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CLINICAL INVESTIGATIONS

Comparison between dexmedetomidine and propofol for sedation in the intensive care unit: patient and clinician perceptions[†]

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The α_2 agonist dexmedetomidine is a new sedative and analgesic agent which is licensed in the USA for post-operative intensive care sedation. We compared dexmedetomidine with propofol in patients requiring sedation in intensive care. Twenty adult patients expected to require a minimum of 8 h artificial ventilation after surgery were randomized to receive sedation with either dexmedetomidine or propofol infusions. Additional analgesia, if required, was provided by an alfentanil infusion. Depth of sedation was monitored using both the Ramsay sedation score (RSS) and the bispectral index (BIS). Cardiovascular, respiratory, biochemical and haematological data were obtained. Patients' perceptions of their intensive care stay were assessed using the Hewitt questionnaire. Sedation was equivalent in the two groups [median (interquartile range): RSS, propofol group 5 (4–5), dexmedetomidine group 5 (4–6) (P=0.68); BIS, propofol group 53 (41–64), dexmedetomidine group 46 (36–58); P=0.32], but the propofol group received three times more alfentanil compared with patients sedated with dexmedetomidine [2.5 (2.2–2.9) mg h^{-1} versus 0.8 (0.65–1.2) mg h^{-1} (P=0.004)]. No differences were found in arterial pressures between the groups, but heart rate was significantly lower in the dexmedetomidine group [mean (SD) 75 (6) *vs* 90 (4) beats min^{-1}]. Extubation times were similar and rapid with the use of both sedative agents [median (range) 28 (20–50) and 29 (15–50) min (P=0.63) respectively for the propofol and dexmedetomidine groups]. No adverse events related to the sedative infusions occurred in either group. Despite ventilation and intubation, patients sedated with dexmedetomidine could be easily roused to cooperate with procedures (e.g. physiotherapy, radiology) without showing irritation. From the clinician's and patient's perspectives, dexmedetomidine is a safe and acceptable sedative agent for those requiring intensive care. The rate pressure product is reduced in patients receiving dexmedetomidine, which may protect against myocardial ischaemia. Dexmedetomidine reduces the requirement for opioid analgesia.

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Inadequate sedative techniques may adversely affect morbidity and even mortality in the intensive care unit (ICU),[1 2] and the search for the ideal sedative agent continues. The ideal agent should satisfy the physician's desire for an effective, safe, titratable, cheap and rapidly acting drug that has both sedative and analgesic properties, and should also prevent anxieties and unpleasant memories for the patient. The published accounts of patients' recollections of the ICU are on the whole reassuring,[3–5] but adverse experiences,

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Table 1 Patient and operative characteristics: median (IQR) or number

	Dexmedetomidine	Propofol
Age (yr)	65 (60–77)	67 (64–74)
Intraoperative fentanyl (μg)	725 (575–1000)	800 (700–1000)
Operation time (h)	5.5 (4–9.5)	4.5 (4–7.5)
APACHE II score	18 (12–19)	16.5 (12.5–20)
Weight (kg)	70 (70–75)	80 (73–83)
Duration of sedative infusion in ICU (h)	10 (8–15)	12 (9–15)
Death	2	1

such as physical discomfort from procedures, inability to communicate and lack of sleep, continue to feature prominently. Thus, when a new sedative agent is compared with the currently used sedative drugs in the ICU, its pharmacokinetic and pharmacodynamic properties will, of course, be contrasted. More importantly, both the physician's and the patient's perceptions of its efficacy require investigation.

The α_2 agonist dexmedetomidine is a new sedative and analgesic agent which has been licensed recently in the USA as ICU sedation for up to 24 h after surgery. Dexmedetomidine provides haemodynamic stability[6] and appears to have no clinically important adverse effects on respiration.[7] Its sedative properties are unique in that it produces only mild cognitive impairment,[8] allowing easy communication between health-care provider and patient in the ICU.[6] We therefore compared the sedative and analgesic properties, safety profile, cardiovascular responses, ventilation and extubation characteristics, and patient perceptions of dexmedetomidine with those of the commonly used i.v. sedative agent propofol in the ICU.

Methods

The St George's Hospital research ethics committee approved the study (Ref. No. 98.06.8) and written informed consent was obtained from all patients. Twenty adult patients (18 yr or older) were investigated. Patients were studied if it was expected that they would require a minimum of 8 h artificial ventilation after complex major abdominal or pelvic surgery. The anaesthetic technique was decided by the individual anaesthetist, although intraoperative analgesia was provided by fentanyl alone, and the dose was recorded. On arrival in the ICU, patients were allocated randomly, using sealed envelopes, to receive i.v. infusions of either dexmedetomidine or propofol whilst being mechanically ventilated, together with the short-acting opioid alfentanil by continuous infusion, for analgesia if required. Alfentanil was used in preference to morphine because recovery after infusion is generally rapid and excretion of active metabolites is not a problem with alfentanil. An initial loading dose infusion of dexmedetomidine or propofol was given to rapidly achieve a steady-state plasma concentration. The loading dose infusion of dexmedetomidine was 2.5 $\mu g\ kg^{-1}\ h^{-1}$ over 10 min followed by a maintenance infusion of 0.2–2.5 $\mu g\ kg^{-1}\ h^{-1}$ into a peripheral or central vein. Propofol was given undiluted as an infusion of 1–3 $mg\ kg^{-1}\ h^{-1}$, after a loading dose infusion of up to 1 $mg\ kg^{-1}$ over 10 min, if required (Diprivan 1% datasheet). Alfentanil was infused at 0.25–1.0 $\mu g\ kg^{-1}\ min^{-1}$ if the patient indicated he or she was in pain (Rapifen datasheet). The degree of sedation was measured and recorded hourly using the Ramsay sedation score (RSS)[9] and continuously using the bispectral index (BI),[10] and patients were maintained at RSS>2 by adjustments to the sedative regimen. No other sedative or analgesic agents were given, and no patient received spinal or epidural analgesia in the perioperative period.

Patients were ventilated mechanically with oxygen-enriched air to attain acceptable blood gases. The sedative infusion was discontinued, in preparation for extubation, when there was no evidence of bleeding and the patient was alert, cardiovascularly stable, normothermic, and with an arterial oxygen tension $\geqslant$10 kPa on an inspired oxygen concentration <40% and had positive end-expiratory pressure <5 cm H_2O. Once spontaneous respiration had been established with pressure support <10 cm H_2O, a tidal volume of >6 $ml\ kg^{-1}$, and respiratory rate $\geqslant$10 breaths min^{-1} but <20 breaths min^{-1}, extubation was undertaken.[11] Extubation time was defined as the time from cessation of sedation infusion to extubation. Heart rate, arterial pressure, central venous pressure and oxygen saturation were monitored continuously. Venous samples were taken for routine haematological (full blood count, coagulation profile) and biochemical (electrolytes, urea, creatinine, liver function, phosphate and calcium) profiles immediately on arrival in the ICU, and then at 24 and 48 h. Cardiovascular and respiratory adverse events were defined as a change in arterial pressure of $\geqslant$40% from baseline, bradycardia <50 beats min^{-1}, tachyarrhythmia, and a respiratory rate <8 or >25 breaths min^{-1} after extubation. Patients were given a Hewitt questionnaire[3] to complete (see Appendix) 48–72 h after discharge from the ICU. The effects of dexmedetomidine on adrenocortical function and endocrine and inflammatory responses were also studied, the results of which are presented separately.[12]

From previous work,[6,7] a sample size of 20 was expected to have a power of 80% to detect a 50% reduction in analgesic requirements and a 20% reduction in heart rate at a significance level of 5%. Data are shown as mean (SD) values unless otherwise stated, and comparisons were made using the unpaired *t*-test. Medians and interquartile ranges (IQR) are quoted for skewed data, and comparisons were made using the Mann–Whitney *U*-test. Haematological and biochemical values and haemodynamics were compared using ANOVA for repeated measures followed by *post hoc* Bonferroni testing. Values of RSS and BI are shown as median (IQR) and were compared by a two-stage method that used summary measures;[13] the area under the curve was calculated for each patient and between-group comparisons were made using the Mann–Whitney *U*-test. $P<0.05$ was accepted as significant. All analysis was carried out using

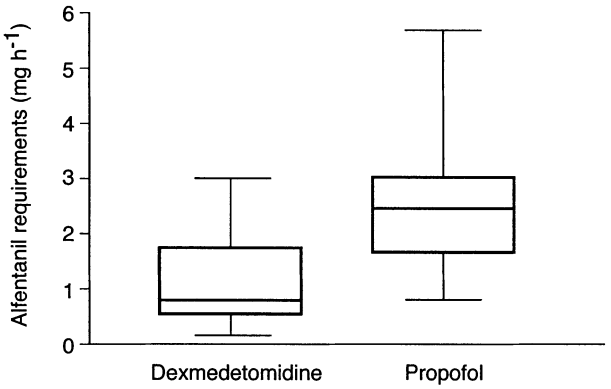

Fig 1 Alfentanil requirements for patients receiving dexmedetomidine and propofol whilst mechanically ventilated in the ICU. Median, IQR and extremes are shown. The requirements were significantly lower in the dexmedetomidine group (P=0.004).

the Statview for Windows software package (version 4.57; Abacus Concepts, Berkeley, CA, USA).

Results

There were no statistically significant differences between the two patient groups with respect to age, intraoperative fentanyl requirements, operation time, APACHE II score, weight, duration of sedative infusion and mortality (Table 1). Two patients in the dexmedetomidine group and three patients in the propofol group received sedation for only 6 h because extubation was indicated clinically. Four patients in the dexmedetomidine group and five in the propofol group received sedation for ⩾12 h. The median (range) dexmedetomidine infusion rate was 0.86 (0.45–1.06) μg kg^{-1} h^{-1}.

Sedation

Over the whole study period, the median (IQR) RSS was 5 (4–5) and 5 (4–6) (P=0.68) for the propofol and dexmedetomidine groups respectively, and BI was 53 (41–64) and 46 (36–58) (P=0.32). The percentage of time spent at what many would consider an ideal depth of sedation (i.e. RSS 2–4) was similar: 49.1% (43.7) for the propofol group and 46.3% (33.1) for the dexmedetomidine group.

Analgesia

Intraoperative analgesia was equivalent in the two groups (Table 1). Patients receiving propofol infusions required significantly more alfentanil [2.5 (2.2–2.9) mg h^{-1}] than patients receiving dexmedetomidine [0.8 (0.65–1.2) mg h^{-1}] (P=0.004) (Fig. 1).

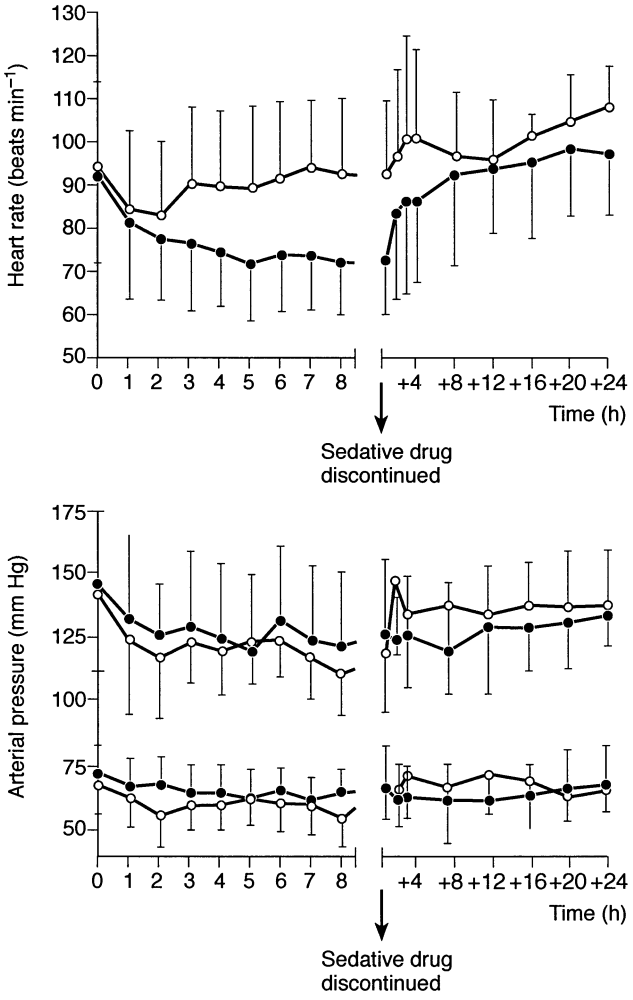

Fig 2 Mean (SD) heart rate (beats min^{-1}) and systolic and diastolic arterial blood pressures (mm Hg) in the dexmedetomidine (closed circles) and propofol (open circles) groups for the first 8 h of intubation and after sedative drug discontinuation. The heart rates were significantly lower in the dexmedetomidine group during intubation (P=0.034 and 0.15 during and after sedative infusion respectively). There were no differences in systolic and diastolic blood pressures between the two groups (P=0.60 during and after sedative infusion). n=10 in both groups except at 7 and 8 h whilst intubated, when n=8 and n=7 in the dexmedetomidine and propofol groups respectively.

Haemodynamics

Patients receiving dexmedetomidine had significantly lower heart rates compared with the propofol group (P=0.034). Arterial and central venous pressures in the two groups were similar at baseline and over the study period (P=0.60 and 0.21 respectively) (Figs 2 and 3). No patient required inotropes, and there were no adverse cardiovascular events in either group. No patient receiving dexmedetomidine exhibited a hypertensive or hypotensive response to the loading infusion dose.

After discontinuation of sedation, heart rates were initially lower in patients receiving dexmedetomidine, but after a return to baseline in these patients there were no differences between the groups (P=0.15). There were no

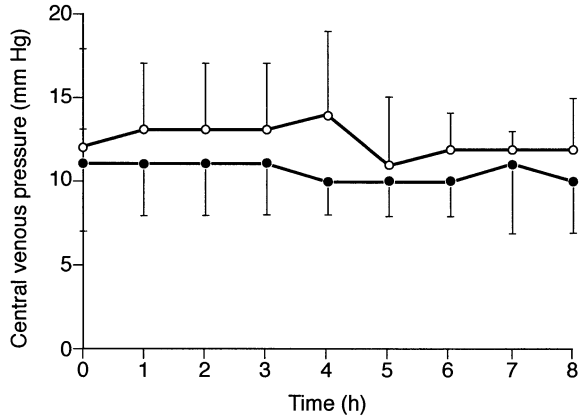

Fig 3 Mean (SD) central venous pressure (mm Hg) in the dexmedetomidine (closed circles) and propofol (open circles) groups for the first 8 h of intubation. There were no significant differences between the two variables at any time point (P=0.21). n=10 in both groups except at 7 and 8 h, when n=8 and n=7 in the dexmedetomidine and propofol groups respectively.

differences in arterial pressures between the groups for this period (P=0.60) and no rebound phenomena were seen (Fig. 2).

Ventilation and extubation

Mechanical ventilation variables and arterial blood gas analysis were similar in the two groups for the first 8 h of intubation and artificial ventilation (Table 2). Significant differences existed in the arterial/inspired oxygen ratio between the two groups at baseline and throughout the study (P=0.003). Mean (range) extubation times were 28 (20–50) and 29 (15–50) min respectively for the propofol and dexmedetomidine groups (P=0.63). There were no respiratory adverse events after extubation in either group, and no patient required re-intubation.

Haematology and biochemistry

Analysis of routinely measured haematological and biochemical variables showed no differences between the groups over the 48 h measurement period (Table 3).

There were within-group differences for sodium, urea and creatinine in the dexmedetomidine group, the leucocyte count in the propofol group and the platelet count in both groups.

Median (IQR) urine output for the study period was 141 (104–177) ml h^{-1} for the dexmedetomidine group and 94 (64–146) ml h^{-1} for the propofol group (P=0.12).

Mortality

Two patients died in the dexmedetomidine group and one in the propofol group, on days 14, 17 and 35 respectively, after initially recovering well.

Patient experiences (Table 4)

Memory of ICU experiences

The majority of patients receiving dexmedetomidine recorded the length of stay in the ICU accurately, in contrast to those in the propofol group (P=0.023). However, only a few patients in both groups remembered the duration of mechanical ventilation; these five patients experienced discomfort whilst receiving mechanical ventilation, although none recorded any pain.

Promotion of safety and security

The majority of patients were pleased to leave the ICU, although it was frequently commented that this was because it signified progress in their recovery. The remainder expressed concerns about leaving the perceived security of the high patient:nurse ratio in the ICU environment to return to the general wards.

Discomforts and anxieties

Noise and difficulty in sleeping were the principal concerns in the propofol group. Discomfort on the ventilator was a major concern in those receiving dexmedetomidine, although it only occurred in three patients.

Discussion

This study and previous work[6] have shown dexmedetomidine to be an effective and safe agent for use as postoperative sedation in the ICU. Unlike previous studies, this one sought to compare the new agent dexmedetomidine with propofol, one of the established i.v. sedative agents regularly used in the ICU. An equivalent depth of sedation between dexmedetomidine and propofol in the ICU was achieved, with the advantage that the opioid requirement was reduced by over 50% in patients who received dexmedetomidine.

It is difficult to quantify the cooperation and ease of management seen with patients sedated with dexmedetomidine in the ICU, which presumably reflects only mild cognitive impairment. This may explain the ease and speed of extubation after dexmedetomidine infusions. Although extubation times were similar in the groups, a longer extubation time would have been predicted with dexmedetomidine from volunteer pharmacokinetic data,[14–16] as the elimination half-life of propofol[17] is approximately three times shorter (30–60 min for propofol *vs* 100–150 min for dexmedetomidine). In fact, dexmedetomidine can be continued safely over the extubation period.[7] According to our results, the sample size in this study had an 80% power of detecting a 40% difference in extubation times between the two groups (α-value 0.05). It is also important to note that species-specific hypoxia,[7] seen particularly in sheep given dexmedetomidine, does not occur in humans (Table 2).

The haemodynamics of dexmedetomidine is predictable from the pharmacology of α_2 adrenoceptor agonists, and has been confirmed from previous studies in volunteers,[18 19]

Table 2 Mean (SD) mechanical ventilation variables and arterial blood gases for the first 8 h period of intubation and mechanical ventilation in patients sedated with dexmedetomidine (D) and propofol (P). n=10 in both groups except at 8 h, when n=8 and n=7 in the dexmedetomidine and propofol groups respectively. RR = respiratory rate; TV = tidal volume; P_{max} = maximum airway pressure; PEEP = positive end-expiratory pressure; Pa_{CO_2} arterial PCO_2; Pa_{O_2}/FI_{O_2} = arterial/inspired oxygen ratio; BE = base excess. *P=0.003: propofol *vs* dexamedetomidine group at that time point

	Baseline		2 h		4 h		6 h		8 h	
	D	P	D	P	D	P	D	P	D	P
RR (min^{-1})	13 (1)	14 (2)	14 (1)	14 (1)	14 (2)	14 (2)	13 (3)	14 (2)	14 (3)	14 (3)
TV (ml)	579 (122)	624 (102)	596 (91)	619 (111)	606 (95)	640 (152)	622 (111)	585 (89)	599 (154)	635 (111)
Pmax (cm H_2O)	24 (3)	25 (3)	25 (3)	25 (3)	25 (3)	25 (3)	24 (3)	24 (2)	24 (3)	25 (2)
PEEP (cm H_2O)	5 (1)	7 (3)	5 (1)	7 (3)	5 (1)	6 (2)	5 (1)	6 (1)	5 (1)	6 (1)
pH	7.32 (0.10)	7.36 (0.07)	7.35 (0.06)	7.33 (0.11)	7.37 (0.08)	7.33 (0.08)	7.38 (0.08)	7.33 (0.10)	7.39 (0.08)	7.34 (0.04)
Pa_{CO_2} (kPa)	4.9 (0.9)	5.2* (0.3)	4.6 (0.4)	5.8* (1.0)	4.7 (0.6)	5.6* (1.2)	4.5 (0.4)	5.8* (1.5)	4.6 (0.8)	5.6* (0.3)
Pa_{O_2}/FI_{O_2}	43 (13)	29 (14)	45 (12)	38 (14)	50 (14)	33 (11)	45 (8)	32 (8)	42 (12)	37 (10)
BE	–6 (4)	–3 (4)	–5 (4)	–4 (3)	–4 (3)	–3 (3)	–4 (4)	–3 (3)	–4 (3)	–3 (3)

Table 3 Mean (SD) biochemical and haematological variables at baseline and 24 and 48 h after commencement of the study in the dexmedetomidine and propofol groups. There were significant within-group differences in sodium, urea and creatinine concentrations for the dexmedetomidine group and in the leucocyte count for the propofol group over the 48 h study period. Significant within-group differences were also present in the platelet counts for both groups (P<0.01). PTT = prothrombin ratio; KCCT = kaolin cephalin clotting time. *P<0.05; **P<0.01 compared with baseline

	Dexmedetomidine			Propofol			P value
	Baseline	24 h	48 h	Baseline	24 h	48 h	(between groups)
Biochemical variables							
Na (mmol $litre^{-1}$)	138 (4)	142 (4)*	143 (3)**	140 (3)	142 (3)	142 (5)	0.84
K (mmol $litre^{-1}$)	4.7 (0.9)	4.2 (0.4)	4.0 (0.5)	4.2 (0.4)	4.4 (0.5)	4.4 (0.5)	0.85
Urea (mmol $litre^{-1}$)	5.0 (2.6)	6.3 (2.5)	8.0 (4.1)*	5.2 (2.7)	5.9 (4.8)	6.7 (5.3)	0.78
Creatinine (μmol $litre^{-1}$)	86 (20)	99 (38)	113 (48)*	83 (22)	97 (35)	101 (40)	0.68
Bilirubin (μmol $litre^{-1}$)	27 (36)	28 (41)	21 (28)	12 (5)f	16 (12)	16 (11)	0.37
Alanine aminotransferase (IU $litre^{-1}$)	23 (17)	26 (25)	26 (30)	38 (48)	46 (71)	47 (71)	0.93
Alkaline phosphatase (IU $litre^{-1}$)	87 (113)	38 (19)	46 (28)	55 (31)	39 (22)	53 (18)	0.64
Albumin (g $litre^{-1}$)	24 (14)	18 (7)	18 (6)	24 (11)	17 (7)	21 (6)	0.67
Calcium (mmol $litre^{-1}$)	2.10 (0.20)	2.09 (0.19)	2.08 (0.19)	2.08 (0.20)	1.97 (0.19)	1.98 (0.19)	0.27
Phosphate (mmol $litre^{-1}$)	1.25 (0.18)	1.22 (0.32)	1.07 (0.36)	1.12 (0.49)	1.27 (0.48)	1.17 (0.43)	0.95
Haematological variables							
Haemoglobin (g dl^{-1})	11.3 (1.4)	10.8 (0.9)	10.5 (0.6)	11.9 (2.2)	10.9 (0.8)	11.3 (0.9)	0.21
Leucocytes ($\times 10^9$ $litre^{-1}$)	8.1 (1.9)	13.0 (10.0)	12.7 (5.4)	8.9 (2.9)	9.3 (2.9)	11.3 (2.4)*	0.44
Platelets ($\times 10^9$ $litre^{-1}$)	239 (88)	160 (59)**	160 (84)**	208 (64)	151 (77)**	155 (68)**	0.63
PTT	1.0 (0.2)	1.2 (0.2)	1.2 (0.2)	1.0 (0.2)	1.1 (0.2)	1.1 (0.2)	0.13
KCCT (s)	47 (7)	48 (3)	51 (7)	48 (9)	55 (9)	47 (5)	0.67
Thrombin time (s)	13 (2)	12 (2)	12 (2)	13 (3)	16 (6)	13 (1)	0.34

patients under anaesthesia[20 21] and, more recently, ICU patients.[6] Great interest exists in the comparative difference in cardiovascular responses between dexmedetomidine and other sedative agents. Vasodilatation, which manifests itself as a reduction in arterial pressure, is a feature of sedation with both propofol[11 22 23] and dexmedetomidine.[6] In this study, equipotent sedative doses of these agents, infused in patients with similar central venous filling pressures, resulted in equivalent mild reductions in arterial pressures. The numerous adverse cardiovascular events seen previously with the loading infusion of dexmedetomidine[6] were not seen in this study. This was achieved by reducing the dexmedetomidine dose during the loading infusion. However, the significantly lower heart rates seen with dexmedetomidine in comparison with patients receiving propofol may lower the risk of ischaemic events during the stressful ICU episode, in particular over the extubation period. Previous studies have shown sustained higher heart rates (mean 90 beats min^{-1}) similar to those in this study for patients receiving propofol in the ICU.[11 22 23]

No differences in measured biochemical and haematological variables were seen between the groups. A few within-group differences were seen (and would be expected) after extensive surgery. The median urine output was greater for patients receiving dexmedetomidine, although this was not statistically significant. Previous experimental data have shown that α_2 adrenoceptor agonists promote diuresis and natriuresis. The mechanisms proposed include inhibition of antidiuretic hormone[24] and/or atrial natriuretic peptide release.[25] However, the small increase in urea and creatinine seen in this study do not support any renal protective effects of dexmedetomidine.

The median BIS values of patients receiving either dexmedetomidine or propofol infusions in this study suggest

Table 4 Patient experiences in the ICU. Numbers of patients are shown. *P=0.023 compared with dexmedetomidine group

	Dexmedetomidine (n=10)	Propofol (n=10)
Memory of ICU experiences		
Accurate recording of length of ICU stay	8	2*
Accurate recording of duration of mechanical ventilation	3	2
Promotion of safety and security		
Efficient and sympathetic nursing and medical staff	10	10
Pleased to leave ICU	6	7
ICU stay described as pleasant overall	10	6
Discomforts and anxieties		
Tracheal suctioning	2	1
Handling and movement of various lines and tubes	2	0
Noise	1	4
Conversations in the ICU	0	1
Difficulty in sleeping	3	7
Discomfort from ventilator	3	2
Pain	0	0
Being on a ventilator	4	2
Fear of procedures	1	0
Being washed	1	1

a low incidence of recall.[10] Although many patients who received dexmedetomidine were able to record their total length of ICU stay accurately, far fewer could recall the duration of mechanical ventilation, presumably because of the use of sedative agents. It may be that any amnesic actions of dexmedetomidine disappear rapidly after discontinuation of the infusion. However, in both groups a few patients were able to remember the period during which they were mechanically ventilated and sedated, and it would therefore be prudent not to use dexmedetomidine alone in patients who are also receiving neuromuscular block agents.

A modified Hewitt questionnaire was used in this study as it has been used by several researchers[3 26 27] to determine patients' recollections, anxieties and discomforts within a few days of their ICU stay. Although patients appeared calm and cooperative to the clinician whilst sedated with dexmedetomidine, this may not reflect their perception of this time in the ICU. Reassuringly, all patients who received dexmedetomidine described their ICU stay as pleasant and were not resentful of any awareness. Sleep, anxiety concerning the ventilator, pain and noise featured prominently in both groups as the major discomforts and anxieties whilst in the ICU, and this again parallels previous studies.[3–5] Interestingly, lack of sleep appeared to be less of a problem in patients receiving dexmedetomidine, and it may be that 'pharmacological' sleep with dexmedetomidine resembles normal physiological sleep. This is relevant because deprivation may correlate with the development of ICU psychosis.[28]

In conclusion, dexmedetomidine appears to be a safe and acceptable ICU sedative agent when both the clinician's and patient's perspectives are considered. Depth of sedation is similar to that given by propofol and the extubation time is equally rapid, despite the longer elimination half-life of dexmedetomidine. The cardiovascular response of patients sedated with dexmedetomidine is similar to that of patients sedated with equipotent doses of propofol, except that those receiving dexmedetomidine do not increase their heart rate. These properties, combined with the analgesic qualities and lack of respiratory depression seen with dexmedetomidine, have advantages for patients at risk from myocardial ischaemia.

Appendix

Questionnaire based on that of Hewitt[3]

We would be grateful if you could answer the following questions detailing your recent experiences in the Intensive Care Unit. Please insert a number in the relevant box or circle the most appropriate phrase.

1 How long do you think you were in intensive care?
- Hours
- Days
- No idea

2 How long do you think you were on the breathing machine in intensive care?
- Hours
- Days
- No idea
- Never

3 When on the breathing machine did you feel
- Pain
- Discomfort

4 Which of the following descriptions best describes the nursing staff?
- Efficient and sympathetic
- Efficient but not always thoughtful enough
- Too attentive
- Too distant
- Unable to remember

5 Which of the following descriptions best describes the doctors?
- Efficient and considerate
- Efficient but did not explain things enough
- Too disturbing and discussed too many worrying medical details in front of you
- Not around enough when you felt you needed treatment or explanations
- Unable to remember

6 Do you think your relatives or friends were allowed to see you enough?
- Yes
- No

received adequate explanation about your progress?
Yes
No

7 Did any/some/all of the following aspects of intensive care upset you a lot?
Physiotherapy
Suction down breathing tubes
Handling and movement of various tubes
Amount of noise
Alarms
Conversations in the ITU (medical or non-medical)
Amount of machinery
Difficulty in resting or sleeping
If you circled this aspect of care, was the difficulty due to any or all of the following?
Pain, discomfort, noise, light, anxiety
Pain
Being on the breathing machine
Fear of insertion of lines and tubes
Fear of machine failure
Being washed
Any other worries—please state

8 Were you pleased to leave intensive care and return to your ward?
Yes
No

9 What are your overall feelings about intensive care?
Pleasant
Unpleasant

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