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Parent satisfaction with paediatric day-surgery: a questionnaire-based study

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Abstract

Potential advantages of paediatric day-surgery are cost saving, improved utilization of staff and hospital facilities, and reduction of stress for the paediatric patient and their family. A successful programme requires careful case selection, full operating and anaesthetic facilities and good follow-up. Current practice is reviewed with regard to initial assessment, preparation for surgery and overall management during the day admission. To provide information on how patients and their parents experience essential aspects of daycare paediatric surgery, a questionnaire-based study on parental satisfaction of paediatric day-surgery was performed. Most children were back to normal, within a few days. Recovery from paediatric day-surgery was rapid and the overall level of parent satisfaction was high.

Keywords: Parent satisfaction; Day-surgery; Questionnaire

1. Introduction

Hospital admission for children inevitably provokes feelings of anxiety for both parent and child. The development of paediatric day-surgery has in some respects eased many of these anxieties. Due to enormous advances in the field of paediatric anaesthesia, for example short-acting narcotics and subtle operation techniques, a great number of paediatric operations can be performed in ambulatory paediatric surgery centres. Patient selection, preoperative assessment, general anaesthesia, postoperative care including oral intake and analgesia, and postoperative follow-up are considered the most important issues in the day-care system. A team approach including paediatric surgeons, anaesthetists and paediatric nurses is considered indispensable for safe and satisfactory day-surgery treatment. Maximising parent satisfaction is of prime importance in today's competitive outpatient paediatric day-surgery market. To assess the parent satisfaction of treatment in a paediatric day-surgery programme and its benefits to the child and family we analysed 136 self-administered questionnaires to identify particular postoperative symptoms: pain, nausea, vomiting, sore throat and normal outcome.

2. Method

One-hundred and thirty-six children (median age 5 years, range 4 months to 13 years) were scheduled for paediatric day-surgery. Selection criteria included general fitness for a paediatric surgical procedure not requiring hospitalisation and no associated congenital malformation or heart disease. In all of these 136 cases, the parents were asked to complete a self-administered questionnaire to assess satisfaction with their paediatric day-surgery experience, including details on their admission, care and postoperative course. The questionnaire responses were anonymous. The study included urological, plastic and emergency operations performed by the same two paediatric surgeons and the same anaesthetic team at an ambulatory Paediatric Day-Surgery Centre in Cologne (Germany) with a referral base of 1.5 million people. All children went home on the same day as operation.

3. The parental satisfaction questionnaire

Based on the Kaiser criterion, three possible factors were identified. We selected a three factor model, because

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it seemed clinically most meaningful. The subscales were interpreted as: (1) surgical staff and general treatment satisfaction; (2) nursing staff and general information satisfaction; and (3) anaesthetic staff satisfaction. Internal consistency of the subscales measured by the Chronbach's alpha coefficient were 0.82 (1), 0.88 (2) and 0.76 (3).

4. Results

From October through December 2001 a total of 136 parents completed the protocol. Sixty-one percent of the patients were male, 39% female. The age ranged between 4 months and 13 years (median 5 years). Just before surgery, all patients were examined thoroughly and detailed instructions for premedications were given to the family. Anaesthesia was performed using sevoflurane and laryngeal mask. All operations were performed by the same two paediatric surgeons and anaesthetic team. The commonest procedures (Table 1) performed were circumcision ($n = 98$), inguinal hernia repair ($n = 4$), orchidopexy ($n = 5$), umbilical hernia repair ($n = 4$), plastic surgery ($n = 10$), hypospadias repair ($n = 4$) and emergency paediatric surgery ($n = 7$). Laparoscopic operations were not performed. After surgery and recovery from anaesthesia, the children were observed in a holding area adjacent to the operating room until fully conscious and alert. The duration of stay after operation ranged between 50 min and 5 h. Before leaving the Paediatric Day-Surgery Centre, the parents were briefed about postoperative care at home like feeding, ambulation and the use of analgesics. A contact telephone number was also provided to the family for any difficulty or emergency. All patients were re-examined 24 h after surgery, for any problem at home and the parents were assessed for their attitude toward this modality. Questionnaires were filled out on the first postoperative day by the parents. Wound pain was present in 50.7% (especially in children after circumcision), sore throat in 21.3%, nausea in 19.9%, sleep disturbances in 11.7%, dysregulation of circulation in 7.3%, bleeding in 7.3% and postoperative fever in 3.6% of cases. Day-surgery was generally well accepted. The factor analysis revealed three factors of parental satisfaction. We found the subscales interpreted as: (1) surgical staff and general treatment satisfaction (Chronbach's alpha coefficient: 0.82); (2) nursing staff and general information satisfaction (Chronbach's alpha coefficient: 0.88); and (3) anaesthetic staff satisfaction (Chronbach's alpha coefficient: 0.76). 90.4% ($n = 123$) of the parents could manage the postoperative period at home satisfactorily. 92.6% ($n = 126$) would recommend paediatric day-surgery to others and 94.2% ($n = 128$) would recommend the paediatric day-surgery unit that they used. The proportion requiring hospital readmission or reconsultation of a paediatrician in the 7 days postoperatively was 8.8%. 7.4% of all parents ($n = 10$) refused operation on their child in a Paediatric Day-Surgery Centre. In two cases a paradoxical reaction to the narcotics was found. In eight cases the parents could not manage the child sufficiently well at home.

Table 1
Surgical procedures (1 October 2001 to 31 December 2001) at the Paediatric Day-Surgery Centre Cologne

Surgical procedures (October–December 2001)	Cases (n)
Circumcision	98 (72.1)
Orchidopexy	5 (3.7)
Umbilical hernia repair	4 (2.9)
Plastic surgery	10 (7.3)
Emergency operations	7 (5.1)
Hypospadias repair	4 (2.9)
Inguinal hernia repair	8 (5.9)

Values shown in the parentheses are in percent.

5. Discussion

Paediatric day-surgery goes by many names-outpatient paediatric surgery, same-day paediatric surgery, short-stay paediatric surgery and 1-day paediatric surgery. Paediatric day-surgery is intended for children who are in reasonably good health and who have passed preoperative screening tests. Paediatric day-surgery offers many advantages: high quality care from the same staff, short stay, short recovery time (due to medical advancements in surgery and anaesthesia), less emotional stress (caused by separation from the child's support persons) and lower costs for health care insurance providers. The operation usually takes less than 2 h and recuperation can be provided where childrens are most comfortable-at home. For a child, it means the comfort of returning home after the immediate recovery period; for a family, the least disruption possible. World-wide, we are seeing ever-mounting interest and pressure to increase the percentage of procedures performed as paediatric day-surgery. Two indicators of value are quality and cost. One of the central indicators of quality in paediatric day-surgery is whether the patient indeed can go home. Outcome measurement in medical care has traditionally included various aspects of clinical and functional status. Parent satisfaction is a very important measurement in the assessment of paediatric health care quality (Table 2).

Table 2
Pre- and postoperative variables and their values

Pre- and postoperative variables	Results
Number of operated children	136 (100%)
Median age	5 years (range 4 months to 13 years)
Gender	Male 61%, female 39%
Anaesthesia	Sevoflurane, propofole, larygeal mask
Parental refusal or reoperation in a Paediatric Day-Surgery Centre (%)	7.4
Postoperative hospital admission/ reconsultation of paediatrician (%)	8.8

Overall level of parental satisfaction with paediatric day-surgery was high and a rapid recovery and successful outcome from paediatric day-surgery was found. The questionnaire identified three factors of parental satisfaction, surgical staff and general treatment satisfaction; nursing staff and general information satisfaction; and anaesthetic staff satisfaction. The results encourage involvement in the evaluation and improvement of treatment, and suggest that the questionnaire should be further developed to fit paediatric day-surgery populations.

Acknowledgements

We want to thank the parents of the children involved in this study who took trouble to fill in and return the questionnaires.

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Short communication

Heparin-induced CVA

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Abstract

Surgeons commonly use heparin as prophylaxis against post-operative venous thromboembolism. Heparin-induced thrombocytopenia and thrombosis syndrome (HITTS) is a rare but potentially fatal complication of heparin therapy. We describe a case of HITTS in a 49-year-old woman, after elective cholecystectomy, which resulted in a CVA. The purpose of this case report is to increase the awareness of this phenomenon among health care professionals involved in day-care surgery and to discuss its management.

Keywords: Heparin; Thrombocytopenia; Thrombosis; HITTS; CVA

1. Introduction

Surgeons commonly use heparin as prophylaxis against post-operative venous thromboembolism. Heparin-induced thrombocytopenia and thrombosis syndrome (HITTS) is a rare but potentially fatal complication of heparin therapy. We describe a case of HITTS in a 49-year-old woman, after elective cholecystectomy, which resulted in a CVA. The purpose of this case report is to increase the awareness of this phenomenon among surgeons and to discuss its management.

2. Case report

A previously healthy 49-year-old woman underwent an elective laparoscopic cholecystectomy as a day case. She had no risk factors for thrombophilia except for smoking. One preoperative subcutaneous 5000 U injection of unfractionated heparin (UFH) was administered as thromboprophylaxsis. Seven days later, she was admitted with biliary peritonitis, which was treated with intravenous antibiotics and a percutaneous drain. The patient was discharged after 14 days once all symptoms had resolved. During this admission, she received twice-daily subcutaneous 5000 U injection of UFH and the platelet count remained within the normal range.

Two days later, she was re-admitted with a right subphrenic collection that was once again treated with a percutaneous drain. Once more the patient was commenced on twice daily 5000 U UFH. Two days following this admission, she developed a left-sided hemiparesis. The platelet count had fallen to 39×10^9 cells/l. MRI confirmed a right middle cerebral artery infarct. MRI angiography revealed a thrombus in the right internal carotid artery.

A diagnosis of HITTS was made which was confirmed by detection of pathogenic HIT antibodies. Heparin was stopped immediately and replaced with lepirudin. Five days later, the platelet count improved and warfarin was commenced. Abdominal ultrasound confirmed the subphrenic collection had resolved.

There was no improvement in the patient's neurological status at the time of transfer to a rehabilitation unit.

3. Discussion

Although heparin is widely used as the anticoagulant agent of choice in surgical patients, it has several potential adverse effects. The most hazardous of these is HITTS, also known as the white clot syndrome in view of the gross appearance of platelet-rich clots at thrombectomy [1]. The syndrome is usually caused by IgG antibodies against platelet factor 4 and heparin [2]. Patients typically develop

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heparin-induced thrombocytopenia (HIT) 5–14 days after initiation of heparin therapy although, it may occur immediately in patients previously sensitised to heparin [2], as in our case. Studies of thrombocytopenia during subcutaneous heparin therapy have shown an incidence of HIT as high as 3% and a 0.9% incidence of HITTS [2]. Delayed onset HITTS has been reported up to 3 weeks after cessation of heparin [3].

Clinical warning signs of HITTS include thrombocytopenia, any unexplained thrombotic event (venous or arterial), skin lesions or finding of white clot at thrombectomy [2]. One of the unique features of HIT compared with other drug-induced thrombocytopenias is that it typically presents with thrombosis rather than bleeding [2]. Venous thrombosis (deep venous thrombosis being the most common) is more common than arterial thrombosis [4]. Pulmonary embolism is the most common life-threatening presentation [4]. Neurological complications caused by HITTS are uncommon but once developed have a poor prognosis [5].

HITTS should be considered as a clinicopathologic syndrome and the diagnosis can be made when clinical symptoms are associated with pathologic HIT antibodies, detected using either a functional or serological assay [2].

American College of Chest Physicians Consensus on Antithrombotic Therapy recommends all patients receiving heparin should have a baseline platelet measured [6]. Platelet count should then be monitored either daily or every second day, during the high-risk period for HIT, i.e. 5–14 days after starting heparin therapy. Persistent decrease in the platelet count of less than 100×10^9 cells/l or a 30% reduction from the baseline should prompt a diagnosis of HIT.

If HITTS is suspected, heparin should be stopped immediately and alternative forms of anticoagulation such as lepirudin, argatroban or danaparoid sodium commenced until resolution of thrombocytopenia, which typically takes 4–7 days [6]. We used lepirudin, which is a recombinant protein that directly inactivates thrombin. Low molecular weight heparin (LMWH) is contraindicated in the treatment of HITTS [6]. Warfarin can be considered once the platelet count rises above 100×10^9 cells/l. The patient with a history of HITTS should never be re-exposed to heparin unless absolutely necessary [2].

The use of LMWH is now becoming increasingly popular in some surgical units. Compared with UFH, LMWH has been shown to be both superior as a thromboprophylaxsis agent and is associated with a much lower incidence of HITTS [6]. There are limited reports in the surgical literature describing this entity. All health care professionals should have a greater awareness of HITTS.

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The efficacy of pre-emptive tramadol in orthopaedic day-surgery☆

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Abstract

It has been suggested that there may be some advantage in pre-emptive administration of analgesics, which may be of some relevance in day-surgery. Post-operative pain control is often difficult due to the reluctance to use potent analgesics, whose side effects include nausea and vomiting, which are an important cause of delayed discharge.

In order to test the potential beneficial effects of pre-emptive analgesia, 110 day-surgery patients were randomly allocated to receive either pre-emptive tramadol or a placebo pre-operatively. Per and postoperative complications were recorded following administration of a standard anaesthetic, comprising intravenous induction with propofol and maintenance with isoflurane. Post operative analgesia and anti-emetics were administered as required. Patients who received tramadol had a slightly lower incidence of postoperative pain, but at the expense of increased nausea; all differences were not significant.

Keywords: Anaesthesia; Day-case anaesthetic; Analgesia; Complication; Postoperative nausea and vomiting

1. Introduction

Postoperative nausea and vomiting (PONV) and pain are the commonest complications following day-surgery, and may result in either delayed discharge or even overnight admission [1]. Standard analgesia such as paracetamol or non-steroidal anti-inflammatory drugs are routinely used in orthopaedic day-surgery but occasionally stronger analgesia, such as morphine, may be required. More potent analgesics such as morphine are generally not regarded as a first line treatment in this setting, because of their side-effect profile, which includes respiratory depression, sedation and PONV [2].

Tramadol, a centrally acting analgesic with both opioid and non-opioid mechanisms of action is reputed to be relatively free from such side effects and therefore may be of potential use in the day-surgery setting [3–5]. In addition there has been some evidence that the administration of analgesics given prior to a painful stimulus may be more efficacious than if given after the event [6,7]. We decided therefore, to investigate the potential benefit of pre-emptive tramadol, in particular, improvements in postoperative analgesia with a corresponding reduction in postoperative analgesic requirements and the resulting side effects.

2. Methods

After local research ethics committee approval and gaining informed written consent, 110 ASA I and II patients aged 16–70 years scheduled for day-case arthroscopy were randomly allocated to receive either an IM injection of tramadol 1–1.5 mg kg^{-1} or, a placebo IM injection of normal saline 1 h preoperatively. A preoperative history was taken which included details of previous PONV/motion sickness and smoking habits. Weight and blood pressure were also recorded.

In the anaesthetic room a pulse oximeter was attached to each patient and intermittent non-invasive blood pressure monitoring was commenced. Intravenous access was established followed by intravenous induction with propofol 2–4 mg kg^{-1} and fentanyl 1–1.5 μg kg^{-1}. A laryngeal mask airway was inserted and gentle manual ventilation was continued until the return of spontaneous ventilation.

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Table 1
Postoperative pain and nausea scoring systems

Pain	None	Mild	Moderate	Severe	Excruciating
Score	0	1	2	3	4
Nausea	None	Mild	Moderate	Severe	
Score	0	1	2	3	

Anaesthesia was maintained with isoflurane in a 66% nitrous oxide in oxygen mixture. A fresh gas flow of 4 l min^{-1} was used with a semi-closed circle system. Intraoperatively, electrocardiogram (ECG), oxygen saturation levels (SpO_2) and end-tidal carbon dioxide concentration ($FetCO_2$) were monitored continuously. Blood pressure was monitored at 5 min intervals. Details of any complications or adverse events involving the cardio-respiratory system were also recorded. In particular, the occurrence of bradycardias (heart rate <50 beats min^{-1}), hypotension (systolic blood pressure <80 mmHg.), low oxygen saturation (SaO_2 <90%), hypercapnia ($ETCO_2$ >6.0 kPa) and coughing were noted.

Postoperative pain, where it occurred, was treated with oral codeine/paracetamol and/or rectal diclofenac. Pethidine (1–1.5 mg kg^{-1}) was used as a second line treatment if required.

Postoperative nausea was treated initially with IM prochlorperazine 12.5 mg and cyclizine 50 mg IM was used for persistent symptoms. Both the intensity and treatment of these symptoms were recorded.

When patients' symptoms were adequately controlled and they were deemed in other respects stable by recovery staff, they were returned to the day ward. Here, further analgesia and anti-emetics were administered if necessary. Prior to discharge patients were asked to complete a questionnaire detailing any postoperative complications such as PONV or pain which they had experienced. Pain was scored on a four-point scale, PONV on a five-point scale (Table 1).

A priori statistical analysis suggested that 50 patients in each group would be needed to demonstrate a 20% difference in the number of patients who required analgesia (with 80% power at the 5% level). For categorical and continuous data a χ^2- test and *t*-test were used, respectively. A probability value of <0.05 was considered to be statistically significant. The study was not powered for outcomes other than analgesia.

3. Results

There were a total of 56 patients in the tramadol group and 54 in the placebo group. The two groups were similar both in terms of demographic data and intravenous anaesthetic requirements (Table 2). There were more patients with a history of PONV and/or motion sickness in the tramadol group (3 versus 1, NS). The patients in the tramadol group received a slightly lower percentage of isoflurane (NS). Perioperative complications are presented in Table 3. In the tramadol group a higher number of adverse events were seen; only bradycardia approached statisical significance ($P = 0.06$, Fisher's exact test).

Table 2
Demographic data values are mean (S.D.) where appropriate

	Treatment ($n = 56$)	Placebo ($n = 54$)
Age (year)	38.9 (11.2)	37.6 (13.9)
Weight (kg)	79.4 (12.1)	78.4 (13.6)
Sex ratio (male/female)	40/16	39/15
History of PONV/motion sickness (*n*)	3	1
Duration of anaesthesia (min)	26.7 (13.0)	27.9 (12.2)
Smokers (*n*)	14	15
Propofol dose (mg kg^{-1})	257 (44.2)	265 (47.5)
Fentanyl dose (μg kg^{-1})	99.6 (3.31)	98.1 (13.48)
Isoflurane concentration (%)	1.61 (0.39)	1.92 (0.18)

All differences are not significant.

Table 3
Perioperative complications

	Treatment	Placebo
Coughing	5	3
Hypercapnia	1	1
Hypotension	0	0
Bradycardia[a]	5	0
Desaturation	0	0
Overnight stay	2	1
Total	13	5

All differences are not significant.
[a] $P = 0.06$; Fisher's exact test.

Fewer patients in the treatment group received anti-emetics in recovery compared with the control group (4% versus 11%, NS)(difference 7%. 95% CI; −3 and 19%). Prochlorperazine 12.5 mg IM was the only anti-emetic used in recovery.

There was no statistical difference in analgesic requirements during recovery. In all, 77% of patients in the treatment group required no analgesia in recovery compared with 67% of control patients. (difference 10 and 95% confidence interval; −6 and 26%), NS ($P = 0.29$). In the placebo group six patients required additional pethidine, although this was not statistically significant. Following discharge from recovery to the day ward, analgesic requirements were very

Table 4
Nausea scores

Nausea score	Treatment ($n = 56$)	Placebo ($n = 54$)
0	47	47
1	5	4
2	3	2
3	1	1
Total nauseated	9 (16%)	7 (13%)
Average nausea scores, mean (S.D.)	0.25 (0.63)	0.20 (0.59)
Total vomited	3 (5%)	2 (4%)

Table 5
Pain scores

Pain score	Treatment($n = 56$)	Placebo($n = 54$)
0	20	17
1	26	20
2	8	13
3	2	4
4	0	0
Total in pain	36 (64%)	37 (69%)
Average pain score, mean (S.D.)	0.80 (0.74)	1.07 (0.92)

similar in the two groups, and most patients in each required no analgesia at all (treatment 75% versus control 74%, NS).

The questionnaire at discharge revealed small differences in nausea or vomiting between the groups (16% versus 13%, NS) (3% difference, CI; −11 and 17%) (Table 4). Reports of pain were also not statistically different (Table 5).

4. Discussion

Pain, nausea, and vomiting are the most common postoperative complications, which prevent the scheduled discharge of day-surgery patients. However, the use of potent analgesics is generally avoided whenever possible, especially long acting opiates such as morphine, which are associated with prolonged PONV and delayed ambulation.

Pre-emptive analgesia has received considerable attention during the last decade [6,8].

Following acute injury, changes take place in the nervous system both centrally and peripherally involving sensitization of nociceptors with corresponding hyperalgesia at the site of injury [8]. However, rapid analgesic intervention may prevent this so-called wind-up (upregulation) of the nociceptive system within the central nervous system [9]. Tramadol's action is dependent upon both opioid and non-opioid pathways [10] and should, in theory, exhibit pre-emptive analgesic effects. In order to test the hypothesis that pre-emptive analgesia might be associated with a better outcome, a placebo-controlled study was adopted, as this was anticipated to provide the best discrimination between treatment and control groups [11], while allowing placebo failure to be treated by administration of analgesics in the conventional manner.

The results of this study demonstrate that there was a small, nonsignificant reduction in analgesic requirements in the recovery unit in the treatment group (23% versus 33%, $P = 0.29$), but also no significant difference in pain scores.

There was a higher incidence of nausea in the treatment group (16% versus 13%) and slightly higher average nausea scores (0.25 versus 0.20), although none were statistically different. Paradoxically, fewer patients from the treatment group were given anti-emetic medication in the recovery ward as compared to the control group (4% versus 11%), though anti-emetic requirements and administration in the day ward were identical in both groups (2%). The incidences of PONV corresponded well with previously published data in similar patient populations [12]. We have shown a non-significant difference in the incidence of side effects between the two groups, particularly the occurrence of bradycardias in the treatment group. Bradycardia is not per-se a side effect of tramadol [13] though opiates in general are known to be associated with bradycardia especially if anaesthesia depth is profound.

In conclusion this study has shown that the use of tramadol as pre-emptive analgesia in day-case arthroscopy patients does not significantly reduce postoperative pain scores or requirements for analgesia. In addition, the higher incidence of perioperative bradycardia together with PONV suggests that its use in this group of patients is of questionable benefit. It is conceivable that using a larger study population would identify an improvement in pain scores.

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Preemptive analgesia with controlled-release oxycodone is successful in prevention of post-inguinal herniorrhaphy pain

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Abstract

In a double-blind randomized study, controlled-release (CR) oxycodone (OxyContin ®) administration was assessed against placebo to ascertain the extent of postinguinal herniorrhaphy pain control. Patients received a single dose of CR oxycodone (40 mg orally) or placebo 40 min before surgery.

When post-surgical pain was first reported, a visual analogue scale (VAS) was used to assess pain score. Postoperative pain-free time, dolestin (opiod) and dipyrone (antipyretic) consumption were assessed 24 h after the surgery. Postoperative pain-free time in the CR oxycodone group (Group I) was 655 ± 548 min versus 112 ± 71.5 min in the placebo group (Group II) ($P < 0.02$). Postoperative 24 h dolestin consumption was 8.3 ± 19.5 mg (Group I) versus 120.1 ± 89.2 mg ($P = 0.004$) (Group II). Postoperative 24 h dipyrone consumption in Group I was 0.58 ± 0.67 g versus 1.42 ± 1.0 g in Group II ($P = 0.004$). Accordingly, 41.7% of patients in Group I demonstrated a need for postoperative analgesic drugs was versus 100% of the patients in Group II ($P = 0.037$). *Conclusions:* Preemptive administration of a single 40 mg oral dose of CR oxycodone significantly reduced both postoperative pain and consumption of analgesic agents, without causing side effects, and may be useful in an ambulatory surgery setting.

Keywords: Preemptive analgesia; Postoperative pain; Oxycodone

1. Introduction

The present study assesses the effectiveness of controlled-release (CR) oxycodone controlled-release medication in providing postoperative pain control after unilateral inguinal herniorrhaphy versus lactose as placebo treatment.

Although uncontrolled pain is a known impediment to postoperative recovery, strategies to ensure patient comfort have yet to be extensively integrated into clinical practice. In the face of expanding numbers of operations, optimal postoperative management becomes increasingly important as a medico economic and public health concern [1,2].

Preemptive analgesia includes the introduction of an analgesic regimen prior to a surgical procedure with the goal of attenuating pain postoperatively or even preventing pain throughout the entire perioperative period [2]. Additionally, since preemptive analgesia reduces the need for post surgical analgesic, patients return to normal activities earlier [3]. Preemptive use of controlled-release medication attenuates postoperative pain by providing stable serum concentrations, thus avoiding the erratic serum drug level fluctuations seen in administration of immediate-release formulations [1].

A search of the literature has found a number of studies published concerning the effect of controlled-released opioids on postoperative pain [2,4]. In contrast to immediate release analgesics, controlled-released opioids are capable of maintaining relatively constant serum levels. One such new opioid preparation available in tablet form is controlled-release oxycodone, which was designed to provide controlled delivery of oxycodone over 12 h. Onset of pain relief is seen within 1 h of administration [5], patient recovery accelerates, and both the need for subsequent opioids injections and for nursing care are reduced [1], a significant economic advantage. The technique may be implemented in an ambulatory surgery setting as well as in a inpatient hospital setting [5].

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Table 1
Influence of preemptive administration of CR oxycodone on postoperative pain severity

Parameters	CR oxycodone group	Placebo group	*P*
Mean age (±S.D.)	55 ± 17	56 ± 14	>0.05
Postop pain-free time (M ± S.D.)	655 ± 548 min	112 ± 71.5 min	<0.02
Dosage of dolestin (M ± S.D.)	8.3 ± 19.5 mg	120.1 ± 89.2 mg	=0.004
Number and percentage of patients requiring post surgerical dolestin	1/1216.7%	12/12100.0%	=0.02
Dosage of dipyrone (M ± S.D.)	0.58 ± 0.67 g	1.42 ± 1.0 g	=0.004
Number and percentage of patients receiving post surgerical analgesics	5/1241.7%	12/12100.0%	=0.037

Some authors have reported that preoperative administration of CR oxycodone was useless in the control of postoperative pain [1,6–9] while in other studies, high efficacy of postoperative pain control was noted [5,10,11]. Most of these earlier studies however, have used a low (10 mg) preoperative dose of CR oxycodone in contrast to the present study which used a 40 mg dose.

2. Methods

The study was conducted in the Surgical Department of Sieff Hospital, Safed, Israel, between 1 February 2002 and 30 August 2002. The trial was randomized, double blind and placebo-controlled. Approval was received from the institutional review board and written informed consent was obtained from patients, aged 30–65 years. All patients were in Groups ASA 1–2 and were scheduled for elective unilateral inguinal herniorrhaphy under spinal anesthesia L3–4 using heavy bupivacaine 10 mg. A total of 24 male patients were screened. Patients using chronic analgesics were excluded.

Two patient groups, namely CR oxycodone and placebo groups, were age-adjusted. Average age in CR oxycodone and placebo groups (M ± S.D.) was similar, 55 ± 17 and 56 ± 14 years, respectively ($P > 0.05$). Twelve patients received 40 mg tablets of controlled-release CR oxycodone orally 40 min before surgery. At the same time 12 patients in the placebo group received lactose tablets.

Assessment of pain severity was performed using a visual analogue scale (VAS) of self-patient method (with 0: no pain to 10: the worst imaginable pain). Postoperatively, all patients received IM dolestin (opioids) or oral dipyrone. When the patient initially complained of pain after operation, he received IM 50 mg of dolestin if the pain was more than 4 by VAS. If the pain score by VAS rose above 4 again, the patient received IM dolestin 1 mg/kg but not more often than one injection every 4 h. When the pain score was less than 4 by VAS, 1 g of liquid dipyrone was administered orally.

For each patient we assessed:

(1) Pain-free time from spinal injection to onset of pain.
(2) Total dolestin (opioid) consumption during 24 h after surgery.
(3) Total dipyrone (antipyretic) consumption during 24 h after surgery.
(4) Side effects such nausea, vomiting, and pruritus as reported by both patients and nurses at any time. *Note*: Patients were interviewed during rounds. Attending nurses were interviewed at the end of their shift.

Selected parameters of postoperative pain intensity were compared between the CR oxycodone and placebo groups. Statistical processing of data was done by Kruskal–Wallis analysis, Npar test, Mann–Whitney *U*-Wilcoxon rank test, and Fisher's exact test.

3. Results

In the CR oxycodone group, postoperative pain-free time was longer versus the placebo group ($P < 0.02$) (Table 1). Only two of the 12 (16.7%) patients in the CR oxycodone group required IM injection of dolestin during the 24 h after surgery, whereas all 12 patients (100%) in the placebo group received 1.9 ± 0.4 doses of dolestin daily ($P = 0.02$) (Table 1). The total daily dose of dolestin in the CR oxycodone group was significantly lower than in the placebo group ($P = 0.004$). In addition, the total daily dose of dipyrone in the CR oxycodone group was much lower than in the placebo group ($P = 0.004$). In the CR oxycodone group five patients (41.7%–5/12) received analgesics (dipyrone or dolestin), whereas all patients in the placebo group did ($P = 0.037$) (Table 1).

No side effects such pruritus, nausea, vomiting, drowsiness, sedation or respiratory depression were noted in either group.

4. Discussion

Unfortunately, opioids such as morphine sulfate or meperidine hydrochloride can produce mental and respiratory depression. They may also cause circulatory impairment that can increase postoperative morbidity when given in doses sufficient to produce postoperative pain relief [12]. These side effects are less characteristic of immediate-release oral opioids.

Immediate-release oral opioids should be given every 4–6 h on patient's request in order to control postoperative pain. These preparations are generally effective in relieving

moderate to severe pain although they can fail in postoperative pain control, thus delaying recovery [1,5,13].

Preemptive analgesia with controlled-release opioids, recently introduced into clinical practice, differs markedly from the current practice of using "as-needed" opioids or nonsteroidal anti-inflammatory drugs (NSAIDs). Controlled-release morphine successfully controlled pain when given 2 h prior to abdominal hysterectomy [7]. The present study demonstrates the efficacy of CR oxycodone administration 40 min before herniorrhaphy.

Some authors have found that preoperative administration of controlled-release opioids or NSAIDs not only reduces postoperative need for analgesic drugs but also the cost of treatment [1,2,5,14]. Positive results of the use of controlled-release opioids were noted in different clinical conditions; for example, controlled-release morphine sulfate tablets in abdominal hysterectomy and cesarean section provided full analgesic effects, whereas side effects such as mild to moderate drowsiness were minimal [15].

Patients who undergo unilateral inguinal herniorrhaphy often experience intense postoperative pain. Pain appears to be inadequately treated in about a half of all surgical procedures [2,16]. Preoperative administration of CR oxycodone reduced postoperative pain intensity both at rest ($P = 0.07$) and during movement ($P > 0.05$). The need for postoperative administration of both dolestin ($P = 0.02$) and dipyrone ($P = 0.004$) was reduced, and the number of patients who needed analgesics was significantly reduced ($P = 0.037$). Thus, patients utilized fewer health-care resources both in terms of medication and in terms of nursing care. None of the patients in either group reported any side effects. This may be due to the fact that most side effects are experienced in the first 2 h after ingestion and during that time the patients were being operated.

5. Conclusion

A single 40 mg dose of CR oxycodone administered preemptively 40 min prior to unilateral inguinal herniorrhaphy significantly decreases postoperative pain and consumption of "as-needed" dolestin and dipyrone, without causing side effects, and may be useful in an ambulatory surgery setting.

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Office-based anaesthesia for vitreoretinal surgery

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Abstract

The objectives of this study were to consider the effectiveness of local anaesthesia (LA) for office-based vitreoretinal (VR) surgery, the requirement to supplement the anaesthetic blockade, the demographic pattern of the sample and the acceptance of LA by patients. This prospective observational audit involved 111 patients that had undergone 128 VR procedures. Assessment data included: patient's information, details of type of anaesthetic, and pain during surgery. A clinical audit was also carried out with telephone survey to establish the postoperative use of analgesics, the frequency of nausea, emesis, and insomnia. Results suggest that VR surgery can be carried out effectively and safely with LA, in an office-based surgery, provided that experienced surgeons exist. We noted a high degree of patient acceptance, a reasonable level of postoperative pain and a low frequency of nausea and vomits.

Keywords: Local anaesthesia; Intraconal; Extraconal; Sub-Tenon blockade; Vitreoretinal surgery; Office-based surgery; Complications

1. Introduction

Office-based ambulatory surgery includes the clinical, organisational and administrative ability to perform surgery in an office setting. In Spain and Italy, there is also a requirement to use local anaesthesia (LA), with analgesia or sedation [1]. Surgical procedures performed in the office tend to be minor. In recent years, LA has been adopted for vitreoretinal (VR) operations [2–4]. In this unit, LA has been introduced over the past 4 years as the single method to proceed with VR surgery. Office-based anaesthesia (OBA) has some components of practice that are unique such as the procedure and patient selection, the extended role of the anaesthesiologist, the anaesthetic management and the patient recovery and discharge [5,6]. An audit of LA for VR surgery was performed over a 16-month period. The aims were: (1) to verify the level of patient agreement with the procedure, (2) to show the suitability of LA for office VR surgery, (3) to assess the frequency of eye pain during the procedures and the effectiveness of sub-Tenon (ST) blockade and (4) to describe the postoperative complications associated with VR surgery under LA, namely, pain, emesis, nausea, and sleep disorders.

2. Methods

Patients were previously selected by the surgeon and anaesthesiologist in the office. Complete oral and written information was given about the process, informed consent was obtained, and relevant preoperative test according with the patient age and American Society of Anesthesiology (ASA) status were carried out. Absolute exclusion criteria were: patient rejection, non-compensated ASA III-IV status, deficient social conditions, severe cognitive impairment, epilepsy, brittle diabetic, drug/alcohol abuser, and patients who can not tolerate supine position.

The patient age, sex, previous surgery, ASA status, comorbid conditions, history of medication use, type of blockade: intraconal (IC), extraconal (EC) or both (I&E) and volume of local anaesthetic were noted. In all cases, a mixture of mepivacaine 2% and bupivacaine 0.5% with or without sodium bicarbonate was used. Hemodynamic variables (heart rate, systolic blood pressure, diastolic blood pressure, and pulsioxymetry) were recorded before the anaesthetic blockade, and during all the process. Intravenous Midazolam or Diazepam was administered for mild

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sedation before the blockade, in a weight basis dose, only to those patients who seemed anxious. All blocks were administered by two experienced anaesthesiologists using standard techniques. Each patient received oxygen throughout the procedure. Analgesia was considered adequate when the patient felt no pain by holding bulbar conjunctiva and lateral muscle insertion. Akinesia was considered perfect when no movement was observed in all directions.

The success of anaesthesia was graded by the surgeon and the anaesthesiologist as follows:

- *grade 1*: adequate analgesia throughout surgery without any supplementation;
- *grade 2*: adequate analgesia with supplemental ST injection;
- *grade 3*: inadequate analgesia despite ST injection;

Patients were encouraged to notify the surgeon about pain during surgery. Additional parabulbar ST infiltration to the superior quadrant was administered by the surgeon, to patients who felt pain at the beginning or during the procedure (Fig. 1). This injection (mepivacaine 2%, 2–4 ml) was not included in the mean volume, and was done with the sclerotomy sites temporarily closed, when required. Every procedure was performed by the same surgeon (who had 8 years of experience) and was ranked as: vitrectomy, scleral buckling surgery, cryosurgery, and other. Redo cases, anaesthetic complications and surgery time were also noted.

The nurses were trained to perform an standardized telephone interview by calling to patients six hours after the surgery in order to identify the main sources of dissatisfaction in the postoperative period i.e.,: pain, nausea, and emesis. For postoperative pain paracetamol with or without codeine was suggested. Using a short questionnaire we categorized postoperative pain as follows: no pain; managed with paracetamol, managed with codeine plus paracetamol or unmanageable using the prescribed drugs. Nausea and vomits were graded as no or yes. No prophylactic antiemetics were given. Sleep disturbances were considered 24 h later by the surgeon. Sleep disturbances were scored as follow: awake, sleep intermittent or sleep as usual. Patient acceptance to anaesthesia and surgery were graded by the surgeon 24 h and 1 week postoperatively, as follows: non compliant, compliant, good or excellent. Finally, patients were asked to give any general observations that might help to enhance their care.

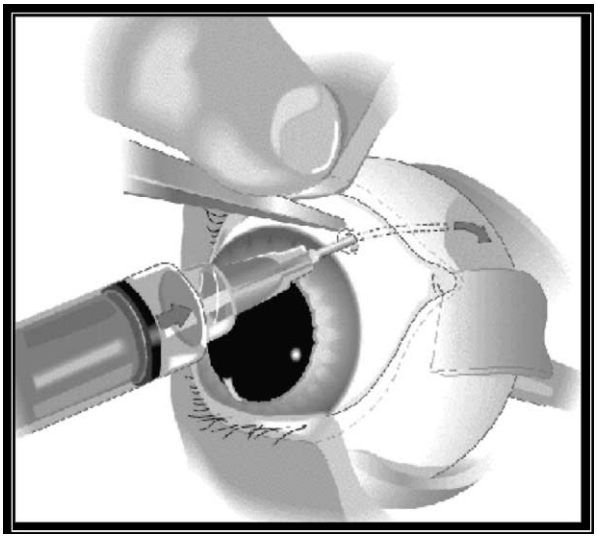

Fig. 1. Parabulbar Sub-Tenon blockade.

Categorical variables are presented as proportions with percentage and 95% confidence intervals (95% CI) and were analyzed with the chi-square (χ^2) test. The corresponding Mantel Haenszel odds ratios (OR) were estimated. Mean and standard deviation were used for surgery time and age and were analyzed by the use of the Student's *t*-test. Multiple logistic regression models were used to asses the association between independents variables (ST requirements, type of surgery, type of anaesthetic blockade, redo cases) and postoperative pain. Statistical tests with $P < 0.05$ were perfomed significant. Data were analyzed using SPSS 11.0 software for Windows.

3. Results

Data were collected prospectively on 111 consecutive patients undergoing 128 VR procedures suitable for OBA, between January 2002 and April 2003. 111 patients received LA for 128 procedures. Procedures included 75 vitrectomies, 45 buckling procedures, 7 cryotherapy and 1 classified as other. All 19 redo cases were performed with LA. Of the 111 patients who underwent VR surgery the mean age was 59 years (S.D. 13 years), and 55% were men. 32% were graded as ASA I, 54% ASA II, 13% ASA III and 1% ASA IV. The mean surgery time for all patients was 83 min (S.D. 29 min). Those procedures which needed supplemental ST blockade (25%) had a mean surgery time of 100 min (S.D. 32 min) versus those who didi not need a supplemental block, 77 min (S.D. 24 min) ($P = 0.000$). The mean volume for the main LA injection (ST not included) was 9.5 ml (S.D. 2.5 ml). Of the 128 LA blocks, 33% were IC, 11% EC and 56% I&E. Addtional sub-Tenon block at the beginning (STi) of surgery was required in 10% cases carried out with I&E block, 21% of IC block, and 36% of EC block ($P = 0.031$) Sub-Tenon blockade during surgery (STd) was needed in 19% of patients with I&E block, 29% with IC block and 43% with EC block ($P = 0.146$). Patients who needed ST blockade ($n = 26$) were younger (meanage = 54 years S.D 13.2 years) than patients ($n = 85$) who did not required it (meanage = 61 years S.D. 13.1 years) ($P = 0.02$). No patient had inadequate analgesia during the surgery after supplemental ST infiltration. Intraoperative complications included quemosis in 7 procedures, 2 cases complained of shoulder pain due to position on the table, in 3 cases urapidil hydrochloride was used to lower blood pressure and 1 case had a blood glucose level of 350 mg/dl, who was treated with an individualized

insulin dose. There were no ophthalmic problems related to anaesthesia in this study.

Patients who underwent cryosurgery ($n = 7$) and other ($n = 1$) were not included in the rest of the study due to the small number of cases. The telephone interview revealed, an overall postoperative nausea and emesis frequency of 8% and 3% respectively. The rate of nausea was 7% in vitrectomy, and 13% in buckling procedures. The rate of emesis was 3% in vitrectomy and 2% in buckling. The surgeon documented sleep disturbances in vitrectomy patients as 19% intermittent sleep and 81% sleep as usual. Sleep disturbances reported in buckling patients were 7% awake, 33% intermittent , and 60% sleep as usual. Patient acceptance of anaesthesia and surgery was compliant 9%, good 68%, and excellent 23% for vitrectomy procedures. Acceptance for buckling procedures was compliant 18%, good 69%, and excellent 13%.

Three predictors of analgesic requirements during and after VR surgery were recognized. (1) Buckling surgery had an odds ratio (OR) of 15 (95% CI = 4–54) for STi, also buckling had an OR of 8 (95% CI 3–20) for STd due to pain, compared to vitrectomy. (2) Buckling had an OR = 5 for needing of analgesia at home (95% CI 2.1–11.7) versus vitrectomy. (3) Those patients who needed STd surgery had an OR = 4.1 for needing analgesia at home (95% CI 1.5–11).

No association was found between the use of sodium bicarbonate or the volume of LA initially employed, and the need of STi or STd.

4. Discussion

The practice of OBA is an integral component of the daily practice of ophthalmic VR surgeons in Spain. The *Consejería de Sanidad de la Comunidad de Madrid* has regulations in place regarding office-based practices [7]. The results of the present study suggest that OBA is an effective and acceptable tool for patients during VR surgery performed by a skilled surgeon with the same surgical standards as in a traditional hospital. VR surgery, unlike cataract extraction, tends to be longer duration and more variable technique. LA has become preferred over general anaesthesia for VR surgery because of improvements in technique, instrumentation and surgical time. The advantages of LA include more rapid return to ambulation, the ability to perform an office-based procedure, patients are often able to commence posturing immediately if required to do so, avoidance of complication of general anaesthesia and surprisingly, quicker surgery. Rao et al. [8] reported that the reason for shorter duration might be that, LA is under time pressure and therefore the surgeon is more directed and purposeful. Different block failure rates have been reported for VR surgery [3,9]. The use of supplemental ST is very common for some VR procedures [2], and several studies have highlighted the efficacy and safety of ST parabulbar block in vitreoretinal surgery [10].

In this audit, buckling surgery, younger age and lengthy procedures were founded statistically correlated with need for supplemental ST block. No patient suffered pain during surgery after adding parabulbar ST infiltration. STi block was needed less often when the anaesthetic method was I&E blockade. All surgeries showed a high level of patient satisfaction. This finding is considered clinically significant by the authors. These outcomes are not easy to compare with other reports because of differences in block techniques, the adjunct of sedation during the procedures, anaesthetic mixtures and number of cases. This study did not address any aspects of well-being condition, a surrogate end point in anaesthetic quality assessment, as recommended by Hofer et al. [11].

The addition of systemic sedation in VR surgery, especially for the painful periods of cryotherapy, scleral buckling, and traction on the globe are recommended in some reports [12,13], whereas in other no sedatives were used [10,14]. The use of sedative drugs is restricted in this office to only those patients in whom gentle reassurance and persuasion fail to calm apprehension. Katz et al. [15] reported an increase in adverse medical events when sedatives and or opiates are used to decrease anxiety and pain during cataract surgery. ST blockade is a suitable alternative to transcutaneous block and conscious or deep sedation for VR surgery [10], since in the OBA setting the patients are transferred from the operating room table to a chair [4].

Any OBA practice must deal with the issues of postoperative nausea and vomiting (PONV) [16]. Nausea appeared in 8% of patients, and vomiting in 3% (two episodes in the same patient); no pre-emptive antiemetics were used. Avoiding opiates during surgery and LA may be the reasons for this low frequency of PONV [6,17]. Analgesic use in the postoperative period was significantly higher in buckling surgery than in the vitrectomy group. A positive correlation was founded between patients who needed ST infiltration and analgesic requirements at home; this outcome may be a predictor to identify patients who will experience more pain after VR surgery, and to take up the measures to avoid it. LA for ophthalmic procedures, as suggested by this study, is the most useful modus operandi in the office, since it may result in more thoughtful analgesia and postoperative pain control, especially when the surgical stimulus is deep and requires great amounts of parenteral medications, or when the purpose is to use fewer medications to diminish side effects and speed up recovery [18].

Rawal et al. [19] reported that sleep disturbances are very common in the postoperative period. The vitrectomy group had less sleeping disorders, but these differences were not statistically significant.

A current overview revealed that the safety of OBA is basically unknown, because no formal scientific study has yet been completed [18]. Concerns may be raised about the risks of OBA for VR surgery [20]. The anaesthesiologist must recognize that safe anaesthesia in office-based practice requires appropriate patient screening/selection, a safely

equipped office, knowledge of the surgical procedure and appropriate care of patient in postoperative recovery. In this small sample audit, there were no medical or ocular complications sufficient to prevent completion of the procedures.

In conclusion, LA appears a safe and effective practice, in selected patients, for various VR procedures performed in an office-based system. Level of patient acceptance seems high with this method. Buckling surgery, younger patients and lengthy surgery times may be considered predictor factors for additional anaesthetic or analgesic requirements during surgery or in the postoperative phase. Further studies should be performed to develop effective plans for the prevention and treatment of frequently seen postoperative side effects.

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A comparison of spinal anaesthesia and propofol-sevoflurane-anaesthesia for ambulatory knee arthroscopy

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Abstract

Background: The aim of this study was to compare spinal anaesthesia (SA) and general anaesthesia (GA) for outpatient knee arthroscopy in terms of recovery profiles and discharge times. *Methods*: Sixty ASA I–II patients were randomized to receive either SA ($N = 30$) with lidocaine 50 mg/ml, 1 mg/kg or standardized propofol-sevoflurane-fentanyl GA ($n = 30$). Postoperative pain, need for analgesics, recovery profiles, complications, discharge times and patient satisfaction were evaluated. Patients were asked to complete a questionnaire after 24 h and 1 week. *Results*: After GA, 27% of patients needed supplemental opioid analgesics in contrast to 3% after SA ($P < 0.01$). Also, after GA 21(71%) patients suffered knee pain during the postoperative week compared to 10 (33.3%) after SA ($P < 0.004$). Intensity of postoperative pain was low (VPS-values <2). Duration of knee pain tended to be longer in GA group: 2.97 days versus 1.37 days in SA group. There were no differences in discharge times. High degree of patient satisfaction was associated with both techniques without statistical difference. *Conclusion*: SA provided superior postoperative pain management and leads to reduced consumption of analgesics, especially strong opioids. Both techniques provide a high grade of patient satisfaction.

Keywords: Spinal anaesthesia; General anaesthesia; Postoperative pain; Discharge times; Patient satisfaction; Knee arthroscopy

1. Introduction

The shift in surgery from inpatient to outpatient practice has taken place due to its cost-effectiveness. Endoscopic knee surgery is commonly performed on an outpatient basis because the operation is short and a rapid recovery is anticipated. The anaesthesia method suitable for ambulatory surgery must fulfill criteria of consistent onset and offset times, permitting a rapid recovery and in addition maximizing safety by having low incidence of side effects such as pain, nausea and vomiting.

Spinal anaesthesia (SA) is safe, has consistent onset and offset times and possesses favourable effects on pain [1]. SA is associated with a lower incidence of postoperative nausea and vomiting than general anaesthesia [2]. The major side effects of general anaesthesia (GA): difficult intubation, aspiration, and malignant hyperthermia, can be avoided. However, one must agree that traditional methods of spinal anaesthesia have proven problematic in ambulatory surgery. Though widespread availability of small-gauge pencil-point needles has largely alleviated the concerns of spinal headache, spinal anaesthesia for ambulatory surgery has fallen into disfavour because of concerns of transient neurologic symptoms (TNS) after intrathecal lidocaine [3] and, especially, concerns about delayed recovery and discharge [4,5].

The purpose of this prospective, randomized study was to determine the operating room efficiency, recovery profile, side effects, pain and patient satisfaction of lidocaine 1 mg/kg spinal anaesthesia compared with propofol-sevoflurane-fentanyl general anaesthesia in outpatients undergoing knee arthroscopy.

2. Methods

Approval was obtained from the institutional ethics committee to enroll 60 ASA I –II patients between the ages of 16 and 60 undergoing outpatient knee arthroscopy. Informed consent was obtained. Exclusion criteria included: morbid

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obesity (BMI > 30), chronic pain state, substance abuse, neurological disease, coagulopathy and infection at the spinal injection site.

The patients were randomly assigned to receive either spinal or general anaesthesia. As premedication all patients received 2 g of paracetamol p.o. Midazolam 7.5 mg was given as needed. An intravenous line was started and Na 0.9% solution was infused at a rate of 10 ml/kg/h. Intraoperatively EKG, SpO2, systolic, mean and diastolic blood pressure were recorded. In general anaesthesia group (GA) end-tidal CO_2 and end-tidal sevoflurane were recorded.

In the SA group, the patients were administered 1 mg of midazolam i.v. for sedation. The lumbar puncture was performed with the patient in the lateral recumbent position on the side to be operated. Lumbar punctures were made with Quincke-type 27G needle in the midline approach with the needle bevel parallel to the dural fibers. Upon free flow of cerebrospinal fluid (CSF), CSF was aspirated for dilution of hyperbaric lidocaine 50 mg/ml to a concentration of 20 mg/ml, and a dose of 1 mg/kg of lidocain was administered. SA patients received no additional intraoperative sedation or analgesia.

In the GA group, the patients were given fentanyl 1 ug/kg, 1 mg of midazolam iv and propofol 2 mg/kg for induction and mivacurium 0.1 mg/kg for intubation. For maintenance of GA the patients were normoventilated with oxygen–air–sevoflurane mixture. Sevoflurane was used as 1 MAC fraction. Additional boluses of propofol 0.5 mg/kg and fentanyl at the discretion of the anaesthetist were administered. No local anaesthetic or opioid was used intra-articularly in either group.

Intraoperative time intervals recorded were: the time of anaesthesia induction (=time zero), duration of the surgical procedure, and total time in the operation room: postoperative time intervals recorded were: ability to take oral fluids, time to walk, time to eat, time to void and the time to home readiness. Patients were checked at 15 min intervals for home readiness. The criteria used were similar to our standard clinical practice: (1) vital signs within 20% of preoperative, (2) fully awake and oriented, (3) able to take oral fluids, (4) able to walk freely without aid, (5) minimal nausea, (6) minimal to moderate pain, (7) able to void, (8) no surgical problem and (9) adult escort person available.

A standard postoperative pain management was applied: primary choice was ibuprofen 600 mg × 1–3. If there were contraindications for NSAID a combination of paracetamol 500 mg and codein 30 mg was given. The same combination was used as additional medication in mild pain. Additional analgesia was provided with fentanyl 0.05 mg i.v. × 1–4. Pain was recorded on a verbal pain scale of 0 (none) to 10 (worst imaginable VPS). All medications were recorded. At the time of discharge the patients were asked about their postoperative pain, nausea, dizziness, vertigo, headache, backache and pruritus.

The patients were given a questionnaire where they were asked whether they had headache, backache, pain in the knee or difficulties with daily activities (micturition, eating, walking, sleeping) during the first 24 h after operation or during the postoperative week. Positive responses were further clarified as to the degree of the complaint; in the case of headaches, whether the headache was positional in nature and, in the case of backache, whether there was associated radiation of pain. Degree of pain was assessed with a verbal pain scale The patients were asked to rate their anaesthesia as poor, satisfied or good and in case of coming surgery on the other knee, would one want the same anaesthesia. All 60 patients returned the questionnaire.

A power analysis was initially conducted for recovery area stay. The sample size was estimated using an effect size of 15 min, a standard deviation of staying in recovery area of 20 min, and an alpha error of 0.05, and beta error of 0.2 (one-tail). The minimum number of patients required per group was 30**.**

Statistical analysis was conducted using SPSS-program. The values are given as mean and standard deviation. Nonparametric data such as VPS, incidence of headache, backache et cetera were analysed by Mann–Whitney *U*, chi-square or Fisher's exact test as appropriate. Continuous data were analysed using analysis of variance. Results were considered significant at a *P* value of 0.05.

3. Results

The demographic data were similar with respect to sex, age, height and body mass index between the two groups (Table 1). An exception was the somewhat higher mean weight in the GA group than in the SA group (76.4 kg versus 71.2 kg, $P < 0.049$). All spinal anaesthesias were successful. In the GA group, the total amount of propofol used was 188.0 mg (±33.7), equalling 2.3 mg/kg and total fentanyl dose 152.0 ug (±24.6), corresponding to 1.83 ug/kg per patient.

3.1. Pain

During the first 24 h after operation the intensity of pain was consistently low, below 2 on the VPS. During the first 24 h at home, there were no significant statistical differences between the groups in incidence of knee pain, headache, backache or sore throat.(Table 2).

Table 1
Demographic characteristics: age, sex, height, weight and BMI in spinal anaesthesia and general anaesthesia groups

	SA ($n = 30$)	GA ($n = 30$)	*P*
Age (years)	42.9 (11.9)	45.8 (7.2)	NS
Sex (male/female)	13/17	10/20	NS
Height (cm)	171.0 (8.2)	172.9 (10.3)	NS
Weight (kg)	71.2 (9.9)	76.5 (10.3)	0.049
BMI (kg/m^2)	24.3 (2.9)	25.5 (2.5)	0.1

Values are given as mean and S.D.

Table 2
Pain profile at home during the first 24 h in spinal anaesthesia (SA) and general anaesthesia (GA) groups

	SA ($n = 30$)	GA ($n = 30$)	P
Knee pain	18 (60%)	24 (80%)	NS
Headache	8 (26.7%)	3 (10%)	NS
Backache	10 (30%)	4 (13%)	NS
Sore throat	0	2 (6.7%)	NS

Results as number (percentage).

During the first postoperative week, significantly fewer patients experienced knee pain after SA than after GA ($P < 0.004$). Table 3. Pain was consistently mild, VPS <2. Knee pain tended to last longer after GA than SA: 3.0 (2.7) days versus 1.4 (2.3). Incidences of backache and headache were not statistically different. The headache was not positional and the backache did not radiate.

3.2. Pain medication

In GA group 28/30 patients had peroral postoperative analgesia. Ibuprofen was used in each case, mean dose was 840 mg per patient. In SA group, all patients had ibuprofen after operation, mean dose being 660 mg per patient.

After GA 11 patients (37%) needed additional pain medication and had paracetamol 500 mg with codein 30 mg. Fourteen GA patients (45%) needed one or several doses of fentanyl, mean dose 102 ug (range 50–510 ug). After SA 9 (31%) patients needed paracetamol with codein and one (3%) 50 ug of fentanyl. The need in postoperative fentanyl consumption was significantly lower in the SA group ($P < 0.01$).

3.3. Complications

Two patients were not discharged until the following day. One patient in the SA group experienced vomiting and vertigo and one patient in the GA group experienced severe pain in the knee.

In the SA group, three patients (10%) complained of mild nausea and one of moderate nausea (3.3%). After GA mild nausea reported one patient (3.3%) and moderate nausea two (6.6%). The incidence of mild to moderate vertigo was 1/30 (3.3%) in the SA group and 4/30 (13.3%) in the GA group. The differences were not statistically significant. Two patients after SA reported mild difficulty with micturition on the first postoperative day at home (6.7%). In the GA group two patients complained of drowsiness (6.7%).

Table 3
Pain profile during the first postoperative week

	SA ($n = 30$)	GA ($n = 30$)	P
Knee pain	10 (33%)	21 (70%)	0.004
Headache	6 (20%)	2 (6.7%)	NS
Backache	7 (23%)	4 (13.3%)	NS
Sore throat	0	2 (6.7%)	NS

The number (percentage) of patients reporting pain in spinal anaesthesia (SA) and general anaesthesia (GA) groups.

Table 4
Operation room and recovery times (in min)

	SA ($n = 30$)	GA ($n = 30$)	P
Duration of operation	27.0 (12.1)	31.7 (16.4)	NS
95% confidence interval	22.0–31.7	24.7–36.2	
Duration of induction	18.4 (4.6)	20.1 (5.7)	NS
Operation room time	62.0 (17.5)	64.3 (15.9)	NS
Total recovery room time	173.3(41.6)	175.6 (43.8)	NS
Time from induction of anaesthesia to			
Able to eat	153.5 (34.0)	154.6 (41.2)	NS
95% confidence interval	138.6–168.0	137.0–164.7	
Free walking	159.0 (36.4)	153.7 (36.8)	NS
95% confidence interval	143.0–170.5	139.7–167.7	
Urination	208.6 (7.9)	214.3 (9.8)	NS
95% confidence interval	201.1–236.7	206.6–248.1	
Home readiness	220.5 (46.0)	227.4 (54.6)	NS
95% confidence interval	192.3–224.9	194.1–234.5	

Values are given as mean (S.D.) and 95% confidence interval for mean.

3.4. Recovery times

Recovery time intervals are reported in Table 4. There were no statistical differences.

3.5. Patient satisfaction

One week after operation all patients would have a similar operation on ambulatory basis. Four of 30 (13%) after SA would prefer another method of anaesthesia whereas one patient (3%) after propofol-sevoflurane-fentanyl anaesthesia would prefer another method. The difference is not statistically significant. Two of the four SA patients who would prefer another anaesthesia deemed the postoperative observation period for too short. One of the two patients discharged not until the next day also disfavoured SA because of vomiting and vertigo. After GA four patients deemed the postoperative observation period for too short but only one of them would favour another anaesthesia.

4. Discussion

In this study, knee arthroscopy performed under spinal anaesthesia was associated with decreased pain immediately after operation and during the postoperative week.

Although more patietns in the SA group tended to prefer another anaesthesia technique, patient satisfaction was good in both groups without statistical difference. Professionality of staff and early discharge were mentioned on commentary sheets as important components of satisfaction in both groups. If complaints were given, it was because of inadequate preoperative information (three patients).

In previous reports comparing spinal anaesthesia with general anaesthesia similar results concerning the postoperative pain have been reported. In the study by Wong et al. [1] patients after GA had more pain in the postoperative recovery room than the patients receiving spinal anaesthesia (61% versus 15%, $P < 0.01$) and a higher incidence of analgesic use (59% versus 7.5%, $P < 0.01$) corresponding equally with our results. In the report by Martikainen et al. [2] the level of postoperative pain was low, below VAS four in all spinal anaesthesias and 86.7% of general anaesthetic patients. This is also in agreement with our findings. Better early pain relief after spinal anaesthesia is the result of residual analgesia in the recovery room.

In contrast to the favourable outcome regarding the postoperative knee pain, head- and backache dominated after spinal anaesthesia. The ethiology of backache is unknown, but may be due to direct trauma of the interspinous ligaments by the spinal needle. In previous study of Wong et al. [1] reported that incidence of backache was 35% after SA compared with 13.6% after GA. This is in good agreement with our 30 and 13% during the first 24 h after operation. Brooks et al. [6] noted no difference in the incidence of backache whether an introducer needle was used or not. In contrast, Morris-Viñoles et al. [7] studied in large randomized prospective study effect of 27G and 29G Sprotte needles to head- and backache. Lumbar ache was reported in 26% of the patients in the 27G group and 18.5% in the 29G group. However, the rates decreased to 4.5 and 0.5% on the seventh day. In our study, difference in incidence of backache was not statistically significant. It is important to note that this study is not powered to address differences in any side-effects. An additional study powered to detect such differences would be needed to compare the techniques for those outcomes.

In agreement with the report of Martikainen et al. [2] 20% of our patients after spinal anaesthesia had headache after 1 week compared with 7% after general anaesthesia. This might be a sign of postspinal headache although the patients reported no positional alteration in headache intensity.

Anaesthesia induction time, operation room time, recovery room time and discharge times were similar in both groups. Martikainen et al. [8] reported in their earlier study significantly longer discharge time after lidocaine spinal anaesthesia compared with propofol-desflurane or propofol-isoflurane. However, no significant difference in recovery unit time was found between lidocaine spinal anaesthesia and propofol-sevoflurane anaesthesia [2]. Applied criteria for home readiness may be the main cause for differing discharge times. Ben-David et al. [9] compared minidose–lidocaine-fentanyl spinal anaesthesia with local anaesthesia and found no difference in discharge times. Their criteria for discharge differed from our criteria in three points: able to stand up and remain standing for >1 min, having-and tolerated per os fluids and voiding was not required before discharge. Our patients walked, tolerated food and voided. In particular, voiding prolonged discharge times in this study.

In conclusion, lidocaine spinal anaesthesia provides superior postoperative analgesia and decreased consumption of analgesics, especially opioids, after ambulatory knee arthroscopy compared with propofol-sevoflurane-fentanyl anaesthesia. Although there appear to be different advantages and disadvantages, both techniques provide a high degree of patient satisfaction.

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Prospective comparison of ambulatory with inpatient laparoscopic cholecystectomy: outcome, patient preference and satisfaction

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Abstract

This prospective study compares inpatient with ambulatory laparoscopic cholecystectomy with respect to outcome, patient preference and satisfaction. In total, 51 inpatients and 42 ambulatory cases were included. Mean operating and total anaesthesia times were significantly shorter for ambulatory patients ($P = 0.010$ and <0.001, respectively). Post-operative pain scores at 24 h were significantly lower for ambulatory patients ($P = 0.005$) but there was no difference after 48 h. Morbidity included three conversions (one ambulatory and two inpatients), one laparotomy for post-operative bleeding and one percutaneous drainage of a haematoma. There was no significant difference in return to home or work activity between the two groups. Measures of patient satisfaction relating to the admission procedure, amount of information received and hospital environment were significantly higher for ambulatory patients ($P < 0.001$, <0.001 and <0.001, respectively). The majority of patients (66%) expressed a preference for an ambulatory procedure. In addition to the demonstrated clinical benefits, ambulatory laparoscopic cholecystectomy is preferred by the majority of patients and is associated with significantly higher levels of overall satisfaction.

Keywords: Ambulatory laparoscopic cholecystectomy; Outcome; Patient preference; Satisfaction

1. Introduction

Laparoscopic cholecystectomy (LC) has become the treatment of choice for patients with symptomatic cholelithiasis [1]. The advantages of the approach include reduced post-operative pain, more rapid recovery time, shorter duration of hospital stay, more rapid return to 'normal' activities including work and improved cosmesis when compared with the open operation [2,3]. During the early phase of its introduction, LC was associated with specific complications such as common bile duct injury and bile leakage [4,5]. As LC has become more widely established the incidence of serious complications has reduced and the operation has become sufficiently safe to be performed as an ambulatory procedure [6–18].

We have performed ambulatory LC (ALC) in our dedicated day surgery unit since 1997 and currently over 50% of elective cholecystectomies are performed as day cases. This approach is associated with high levels of overall patient satisfaction [9,12,13,17]. Since patient preferences are becoming an increasingly important factor in planning elective surgery, we performed a 6 month prospective study to determine whether there was a difference in outcome and patient satisfaction following ALC compared with inpatient LC (ILC) performed in the same institution.

2. Methods

All patients undergoing elective LC over a 6 month period who gave written informed consent to take part in the study were included. Patients with a history of cholecystitis, cholangitis, pancreatitis or a common bile duct calculus were not excluded provided appropriate investigations and intervention had been performed preoperatively. Patients

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who met with established criteria were offered day surgery: American Society of Anaesthesiology (ASA) class I–II, body mass index $<32\,kg/m^2$, having a responsible adult accompany them home afterwards and living within 50 miles of the hospital. Those who did not meet these criteria or who refused day surgery underwent a routine ILC. The operation was performed either in our dedicated day surgery unit or in the Hull Royal Infirmary main theatre complex under the care of one of three consultant surgeons with a subspecialist interest in minimal access surgery. A standard four port approach (incorporating two 10 mm and two 5 mm incisions) with local anaesthetic infiltration of subcutaneous tissues (with 0.5% bupivicaine) was used. Both intra- and post-operative analgesia and antiemetic medication were administered as necessary to facilitate recovery [19,20].

Data was collected prospectively using a proforma filled in by the operating surgeon and analysed on an intention to treat basis using SPSS for Windows release version 11.5.0 (Chicago, IL). Post-operative pain and nausea scores were recorded by the recovery room staff. Criteria for admission for day surgery patients included: conversion to open cholecystectomy, post-operative bleeding, excessive pain, nausea or vomiting, failure to void urine or be fully ambulatory after the operation. All patients underwent a telephone interview at 24 and 48 h, and at 6 weeks postoperatively. Inpatients were similarly interviewed on the ward or by telephone to obtain this data. During the 6 week interview, information regarding readmission to hospital, attendance at the general practitioner or accident and emergency department and return to normal activities was obtained. Patients completed a questionnaire detailing satisfaction with the hospital atmosphere, admission procedure, the quality of pre- and post-operative information received and whether they would have preferred a day case or inpatient operation.

3. Results

Of the 93 patients studied, 51 had conventional ILC and 42 underwent ALC. The median age (range) of the ALC group was significantly lower than for ILC (44 (27–69) year versus 61 (20–86) year, $P < 0.001$). The mean (S.D.) body mass index was also significantly lower for ALC compared with ILC patients (25 (3) kg/m^2 versus 28 (6) kg/m^2, $P = 0.008$). The male:female ratio was 10:32 for ALC versus 16:35 for ILC ($P = 0.419$). There were similar numbers of ASA II patients in both groups (12 ALC versus 16 for ILC, $P = 0.310$).

Outcome measures between the two groups were compared and are shown in Table 1. Mean (S.D.) operation time and mean (S.D.) total anaesthesia time were significantly lower among day cases (35 (12) and 48 (15) min) compared with inpatients ((42 (15) and 68 (18) min), $P = 0.010$ and <0.001, respectively). Conversion to open cholecystectomy was necessary in one ALC patient (2%) and two inpatients (4%, $P = 0.573$). The median (range) duration of hospital stay for the ALC group was 8.5 (6–504) h versus 26 (16–504) h for inpatients ($P < 0.001$). One patient in each group had a prolonged length of stay of 21 days (504 h). A 75-year-old male inpatient underwent an exploratory laparotomy for post-operative bleeding and eventually made an uneventful recovery. A 64-year-old female ALC patient underwent percutaneous drainage of a haematoma and had a similar outcome.

Table 1
Clinical outcomes of inpatient versus ambulatory laparoscopic cholecystectomy

	ILC ($n = 51$)	ALC ($n = 42$)	P-value
Operation time (min)	42 (15)*	35 (12)*	$0.010^{\ddagger}$
Anaesthesia time (min)	68 (18)*	48 (15)*	$<0.001^{\ddagger}$
Conversion to open operation	2 (4)	1 (2)	$0.573^{\dagger}$
Pain score after 24 h	5 (0–9)**	3 (0–10)**	$0.005^{\$}$
Pain score after 48 h	2 (0–7)**	2 (0–9)**	$0.117^{\$}$
Nausea & vomiting score	0 (0–2)**	0 (0–5)**	$0.920^{\$}$
Duration in hospital (h)	26 (16–504)**	8.5 (6–504)**	$<0.001^{\$}$
Attendance to general practitioner or casualty during recovery	9 (18)	8 (19)	$0.862^{\dagger}$
Return to home activities days	18 (2–52)**	14 (2–35)**	$0.497^{\$}$
Return to work days	25 (7–52)**	25 (10–70)**	$0.823^{\$}$

Values are expressed as absolute numbers (%), mean (S.D.)* or median (range). (**) Statistical analysis was performed using Mann–Whitney U-test, ($^{\$}$) Chi-square or (†) Fisher's Exact test or (‡) independent samples t-test where appropriate.

Median pain scores after 24 h were found to be significantly lower in patients who had undergone ALC compared with ILC (3 (0–10) versus 5 (0–9), $P = 0.005$). However, there was no statistically significant difference after 48 h (2(0–9) for ALC versus 2(0–7) for ILC, $P = 0.117$). There were no significant differences in median post-operative nausea or vomiting scores between the two groups (0 (0–5) versus 0 (0–2), $P = 0.920$). Eight patients (19%) who underwent ALC required overnight admission. Of these, one patient had required conversion to open cholecystectomy to control bleeding. A further five patients had required insertion of an intraperitoneal drain during surgery due to generalised oozing of blood and were admitted as a precaution. Two other patients required admission for nausea control and cardiac monitoring of new onset ectopic beats, respectively. Eighteen patients (seven ALC and 11 from the ILC group) had intra-abdominal drains inserted during LC due to oozing of blood. Drains from two of the ALC cases were removed after 4 h and the patients were discharged. The remaining five patients were admitted for observation and discharged the following day after removal of the drain and a satisfactory haemoglobin result.

Seventeen patients (18%) attended their general practitioner or the casualty department during the recovery period complaining of pain, 'trapped wind' or nausea. They com-

Table 2
Patient preference and satisfaction following inpatient compared with ambulatory laparoscopic cholecystectomy

	ILC ($n = 51$)	ALC ($n = 42$)	P-value
Prefer day surgery	24 (47)	37 (88)	<0.001†
Prefer inpatient admission	27 (53)	5 (12)	<0.001†
Reason given for preference			
Safety	22	2	
Pain control	2	1	
Better sleep	1	0	
Away from children	2	0	
No reason expressed	0	2	
Admission procedure score	7 (5–9)*	9 (6–10)*	<0.001$
Environment score	7 (4–9)*	9 (5–10)*	<0.001$
Information given score	8 (6–9)*	9 (4–10)*	<0.001$

Values are expressed as absolute numbers (%) or median (range). (*) Statistical analysis was performed using (†) Chi-square or ($) Mann–Whitney U-test where appropriate.

prised eight ALC cases and nine from the ILC group ($P = 0.862$). Two ALC patients and one ILC case were readmitted for overnight hospital stay on the 4th post-operative day with severe pain, which settled with conservative management. There was no significant difference in return to home activities or work between the two groups (Table 1).

Overall, 61 (66%) patients expressed a preference for a day surgery approach. Among the 42 ALC patients, 37 (88%) claimed to prefer a day case procedure versus 24 from 51 (47%) inpatients ($P < 0.001$). Of the 27 (53%) inpatients who preferred an overnight stay, 22 gave safety as their main reason. Other reasons included better pain control, better sleep quality and being able to recover free from the responsibilities of children at home (Table 2). Of the five (12%) ALC patients who expressed a preference for an overnight stay, two volunteered safety and one gave pain control as reasons for their preference. Questionnaire scores related to satisfaction with treatment, i.e. the quality of the admission procedure, hospital environment and information supplied were significantly higher for the ALC group compared with the inpatients (Table 2).

4. Discussion

There is increasing evidence supporting the role of LC in the ambulatory setting [6–18]. In addition to the confirming the benefits of LC over open surgery, we have provided further support for the procedure in terms of patient preference and satisfaction. In this study, we have demonstrated the anticipated outcomes after ambulatory LC observed elsewhere. These include a low conversion rate of 5% or less, a same-day discharge rate of over 80% and low readmission rates following discharge [8–16]. There were no deaths, bile duct injuries, bile leaks or retained ductal calculi observed during this investigation. Our operating times are lower than many other reports [12,15,16] even though over a half of our ALC were performed by supervised higher surgical trainees [21]. The reduced operating time compared with other studies may reflect our practice of performing selective cholangiography and endoscopic intervention prior to attendance for elective LC. Keeping the operating time as low as possible is associated with a lower incidence of admission following ALC [15].

Following surgery, pain scores were significantly lower with ambulatory LC after 24 h but the difference was not sustained after 48 h. This may reflect the larger body habitus and differences in analgesia requirements of the inpatients or could be related to the multimodal approach to analgesia and antiemesis adopted by the day surgery unit that has previously been shown to be of benefit [19,20]. Others have reported similar outcomes without adherence to a strict anaesthetic protocol [18]. It is more likely that the higher nurse to patient ratio adopted by the day surgery unit provides more effective support for pain and emesis control.

Interestingly, none of the patients who were admitted directly from the day surgery unit required pain control. However, three patients were readmitted with pain on the 4th post-operative day. This pain settled with an appropriate adjustment in analgesia. The duration of hospital stay among ambulatory patients was similar to other studies [8–10]. Even among the inpatients, who were significantly older and with a higher body mass index, the median duration of stay was only 26 h. The relatively short and uncomplicated stay for this group suggests that many of them might have been candidates for ambulatory surgery. In the future, we could consider broadening our selection criteria for consideration of ALC.

We had several admissions from the day surgery unit following insertion of a drain during the operation. Although this is not our routine practice, similar numbers of drains were used in both groups. They are usually removed after 4 h if the condition of the patient and drainage was satisfactory or withdrawn the following morning in those staying overnight. The day surgery patients with drains were admitted mainly as a precaution but none of them suffered serious sequelae. With hindsight, these patients may have been suitable for discharge directly from the day surgery unit, albeit with a longer duration of stay. Our admission rates following ambulatory LC were in the region of 20% which is in concordance with other series [13–15], however, they could probably have been lower if some of the drains had been removed earlier.

Ambulatory patients scored significantly higher than inpatients for satisfaction in all three components of the questionnaire. They preferred the admission procedure, day surgery unit environment and the amount of information received prior to surgery. In the study by Lillemoe et al. [12], over 75% of patients reported their day surgery operation as ‘good’ and Mjaland found 95% of patients described their experience as ‘excellent’ [9]. Others have found that although 84.5% of patients were ‘satisfied’ with the procedure, there were concerns expressed about the quality of informa-

tion received [13]. Our dedicated day case unit is separate from the main hospital and is run by skilled and well motivated staff with established protocols for patient admission, information, discharge and follow up [21]. All of the patients are provided with written and verbal instructions about the procedure beforehand. It has been demonstrated that such material decreases patient anxiety and contributes to a feeling of well being [22]. We believe that when performed in a suitable environment, ambulatory LC can be done safely and will be acceptable to patients. On the other hand, the lack of a dedicated unit has been shown to deter patient acceptance of day case operations [18].

A significantly higher proportion of inpatients said they would prefer an inpatient operation. The majority of patients who expressed a preference for an inpatient procedure cited safety as their reason. Although there is likely to be a substantial selection bias in these questionnaire responses, those patients who express a preference for in hospital care on the basis of safety could represent a group in whom pre-operative education may help to modify their preference towards day case surgery.

We found no significant difference between the two groups with regard to motivation to return to ‘normal’ activities. Patients in either group resumed home activities weeks and work within 3 or 4 weeks. This is similar to the outcome reported by McLaughlan and Macintyre for all LC patients [23] but not as good as is reported in other series [17].

This study has demonstrated that when a dedicated day surgery unit is utilised, there are significant benefits to be gained in terms of outcome and patient satisfaction when performing LC in the ambulatory setting. We recommend that where appropriate expertise and resources exist, this approach should be adopted routinely since the majority of patients prefer it.

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Influence of preoperative oral ibuprofen on postoperative pain and normal activities in children after ambulatory genito-urinary surgery

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Abstract

Introduction: To investigate the possible advantage of administration of preoperative oral ibuprofen in children on the experience of postoperative pain and resumption of normal activities such as normal sleep and play activity.

Material and methods: A prospective, randomized, double blind study in 54 children (0–14 years) who underwent an ambulatory urological operation was performed. The children of the experimental group received 1 h prior to surgery, 10 mg/kg oral ibuprofen together with their usual premedication, whereas the children of the control group received only the usual premedication. Anesthesia was conducted with sevoflurane inhalation and either a locoregional caudal block (children <30 kg) or local analgesia (children >30 kg). Immediate postoperative pain was assessed using the Faces Pain Scale and the Children's Hospital of Eastern Ontario Pain Scale (CHEOPS behavioral scale). Vomiting and nausea were also assessed. On the first and second postoperative day, the same variables were evaluated, as well as quality of sleep, play and need for pain medication.

Results: After performing subanalysis, it was the older children (10–14 year) from the experimental group who experienced more pain. No significant differences were found regarding vomiting and nausea in the hospital or at home ($P > 0.05$). The assessments of the parents, children as well as the investigators' were concordant throughout the study.

Conclusions: Older children (10–14 years) who underwent ambulatory genito-urinary surgery under local anesthesia with sedation required more analgesia than was provided by this regimen. The older children who received preoperative oral ibuprofen (10 mg/kg) demonstrated significantly more pain early postoperative and on the first day at home. This study did not show a difference in postoperative pain, nausea and vomiting, or sleep and play quality up to 2 days after surgery that could be attributed to preoperative oral ibuprofen; however, the number of patients studied may have been too few to detect a difference. The children's and parents' assessments of pain using the face scale and the investigators' assessments using the CHEOPS scale were comparable.

Keywords: Ibuprofen; Pre-emptive analgesia; Pain assessment in children; Postoperative pain; Ambulatory genito-urinary surgery

1. Introduction

Surgery causes both pain and inflammation. In pediatric surgery, more and more elective operations are being performed on an ambulatory basis. Ambulatory pediatric surgery can only be successful if pain can be well managed and if the children are able to resume daily activities fairly quickly [1]. Furthermore, the pain experienced by the child in hospital after surgery predicts the behavioural problems and pain at home after discharge.

Recently, more attention is focused on pre-emptive analgesia. In adult patients, this phenomenon has been observed, but not in children [2,3]. It has been suggested that pre-emptive administration of analgesia might reduce postoperative pain to a greater extent than postoperative administration [3]. For children aged 5–12 years, after different types of surgery, ibuprofen has been shown to be effective for postoperative pain relief administered either rectally or orally as a liquid

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[4]. It provides analgesia, whilst it does not have respiratory depressant or sedative effects [4].

Therefore, this study assessed the possible positive effects of administering preoperative ibuprofen in children undergoing urological ambulatory surgery, by analyzing their postoperative pain and discomfort, nausea and vomiting, and resumption of daily activities.

2. Materials and methods

We conducted a randomized, prospective, double blind study at the outpatient surgery unit of the University Hospital Gasthuisberg Leuven in Belgium. The protocol and consent forms were approved by the institutional Ethics Committee. Informed consent was obtained from the parents and if possible by the children.

Inclusion criteria for this study were healthy boys, age between 0 and 14 years, Dutch speaking, scheduled to undergo genito-urinary surgery (circumcision, hydrocele, cryptochidism, hypospadias repair, antegrade sclerotherapy for varicocele). The boys were divided into two groups on a random basis: the experimental group (n = 28) and the control group (n = 26). The children in the experimental group were given preoperative ibuprofen (10 mg/kg) and the normal premedication alprazolam (>8 year) 0.5–1.0 mg or midazolam (<8 year) 0.25–0.5 mg/kg. The children in the control group received in addition to the usual premedication a placebo liquid. The examinor and dedicated postoperative observor did receive the key of the randomization group after collecting the entire data. The measurements in the experimental group as well as in the control group were compared with each other at the defined points in time.

Induction of anesthesia was performed by inhalation of sevoflurane. The patients received an intravenous line and a laryngeal mask was placed. If the patients were under 30 kg a locoregional caudal block was performed. The patients were turned in a lateral position and 0.5 mL/kg bodyweight of 0.25% levobupivacaine for procedures at the penis and 1 mL/kg bodyweight of 0.25% for procedures in the groin or the scrotum was injected in the sacral canal. If the patients weighed more than 30 kg, local anesthesia was given by the pediatric urologist during the procedure using 10 mL 0.25% levobupivacaine. Within the first 2 h of recovery, all children received paracetamol 20 mg/kg either orally, intravenously or rectally and oral ibuprofen 10 mg/kg.

Pain assessment in children relies on a combination of observed and behavioral changes that accompany painful stimuli and self-report by the patient [5]. To measure pain, we used the Faces Pain Scale (see Fig. 1). This is a self-report scale that can be used by children as well as by adults. A child's self-report is to be considered the 'gold standard' for pain assessment despite limitations [6]. In addition, pain is a highly individualized and subjective event and in infants it is complicated by their inadequacy to communicate pain and the variability of the infant's physiological and behavioral

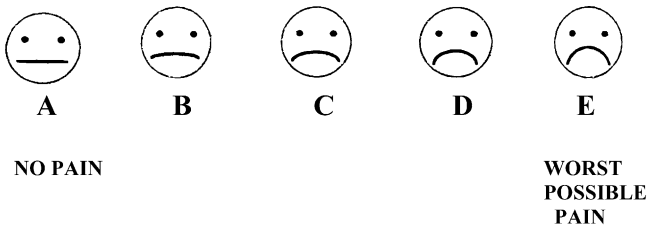

Fig. 1. Faces Pain Scale as used by the children and the parents.

responses [5–7]. We also included a second measurement tool, the Children's Hospital of Eastern Ontario's Pain Scale (CHEOPS behavioral scale). This scale identifies six groups of behavior patterns among 1–5-year-old children experiencing postoperative pain. They were: cry, facial expression, verbalizing, movements of torso and legs, and touching of the wound [8–11].

The data-collection was divided in two phases. The first phase was the measurements of pain in the hospital. During the first and second postoperative hour, the investigator asked the parents and their children to assess pain using the Faces Pain Scale, and vomiting and nausea as a dichotomous variable. Of the children who were too young to assess their pain themselves, only assessments of the parents were collected. The investigator used a behavioral descriptor scale: the CHEOPS scale to assess the children's pain behavior. This measurement was performed as a control measure of the data provided by the parents and children.

The second phase of the study was the follow-up on the first and second day home. On the first and second postoperative day, the parents were contacted by phone. Together with the investigator, they went over a questionnaire that asked for assessment of pain of the child by the parents and the children, vomiting and nausea, use of analgesia, quality of sleep and play of that same day. The quality of play and sleep was assessed using an ordinal scale with five possibilities, ranging from very good (=0) to very bad (=4).

This telephone contact was always at night between 6:30 p.m. and 8:30 p.m.

A probability level of 0.05 was used to determine statistical significance. Non-parametric calculations were performed with the Mann–Whitney U-test. Parametric calculations were performed with Student's t-test. The chi-squared test was used where applicable. All analyses were two-tailed and were performed using the SPSS software. t-Test was conducted to compare ages in the experimental and the control groups. The Mann–Whitney test was used to compare the difference in postoperative pain intensity between the experimental and the control group. No power analysis was done.

3. Results

In the duration of 4 months of this study (half of November 2000 to the end of February 2001), 61 boys underwent such an operation of whom 54 completed the study. The seven

children who were excluded had either incomplete data due to loss of contact at the first and/or second postoperative day (2/7) or insufficient analgesia from the locoregional caudal block (>30% increase of heart rate within the first 2 min after surgical incision). The distribution of age was: 22 children (41%) were 0–4 years old, 13 children (24%) were 5–9 years old and 19 children (35%) were 10–14 years old. The mean age in the treatment groups did not differ significantly (t = l.25; d.f. = 52; P = 0.218).

3.1. Postoperative pain

3.1.1. First hour postoperative

There was no significant difference in pain-intensity between the experimental group and the control group overall. However, after sub-analysis of the group of children between 10 and 14 years of age, there was a significant difference between the experimental group and the control group. This was seen in both the assessments of the parents (P = 0.03; z = −2.16) and the children (P = 0.024; z = −2.53) using the Faces Scale, as well as in the assessment of the investigator with the CHEOPS scale (P = 0.04; z = −1.985).

3.1.2. Second hour postoperative

On the second postoperative hour, there were significant differences between the experimental group and the control group. Significantly more children in de experimental group complained of pain (parents: P = 0.03; z = −2.14; children: P = 0.015; z = −2.47; investigator: P = 0.014; z = −2.47) (see Fig. 2). After sub-analysis, in the group of children of 10–14 years of age, the experimental group scored significantly higher on the pain scale (parents: P = 0.03; z = −2.95; children: P = 0.03; z = −2.95) and behavioral scale (P = 0.01; z = −2.57) than the control group.

3.1.3. First day at home

On the first postoperative day, the children of the experimental group scored more pain than the control group (P = 0.018; z = −2.37). Again, in the age group of 10–14 years this difference was significant (P = 0.001; z = −3.347). In the age groups of 0–4 and 5–9, no significant difference was found between the EC and the control group. Of all the children, 53% did not have any pain. Seventy percent of the children who were pain free belonged to the control group.

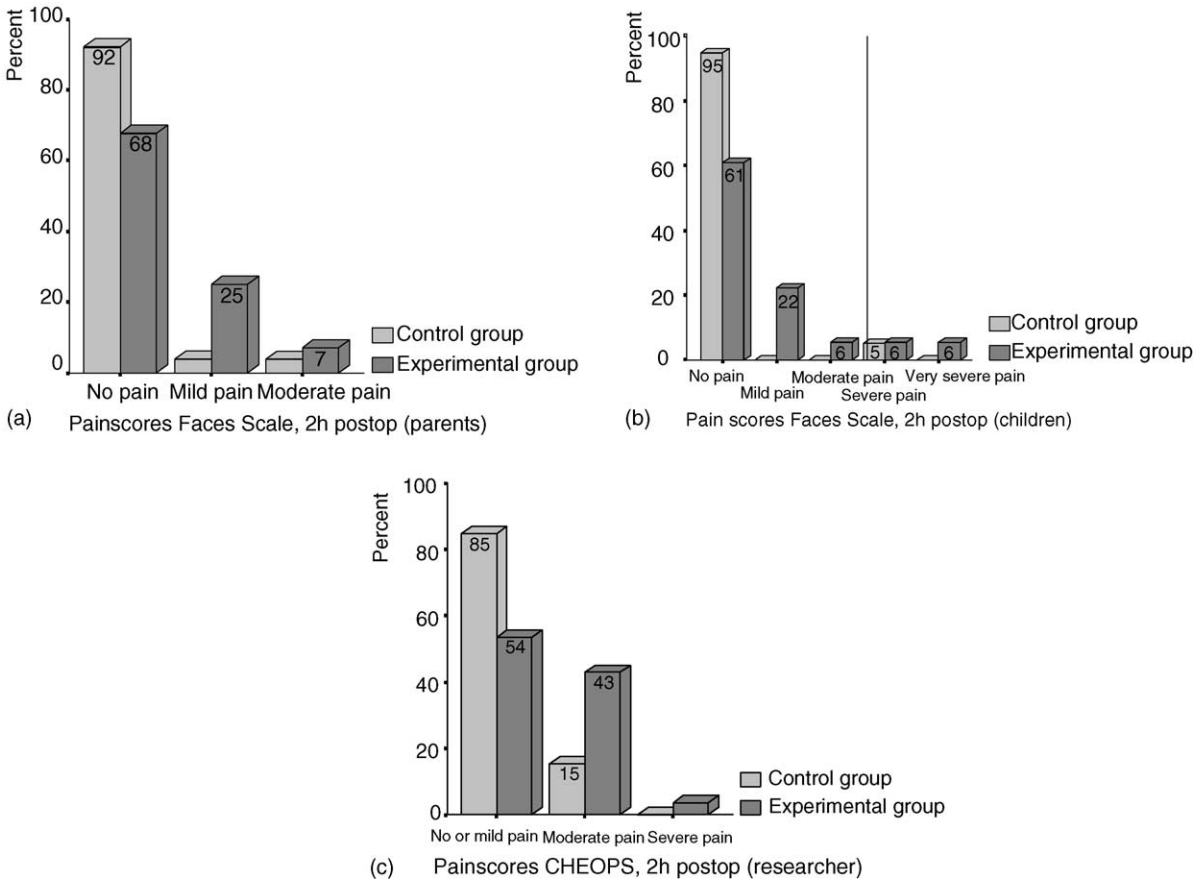

Fig. 2. Histograms of the results of pain assessments, respectively, by the parents, the children and the researcher in the entire group of children on the second postoperative hour.

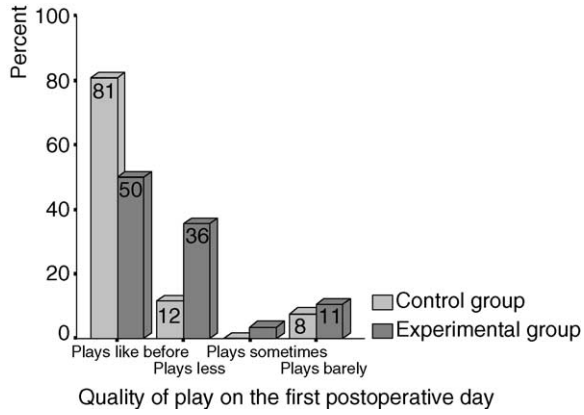

Fig. 3. Histogram of the quality of play on the first postoperative day.

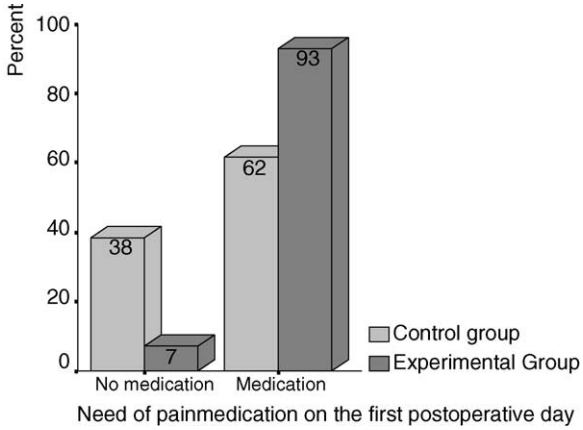

Fig. 4. Use of painmedication at home on the first postoperative day.

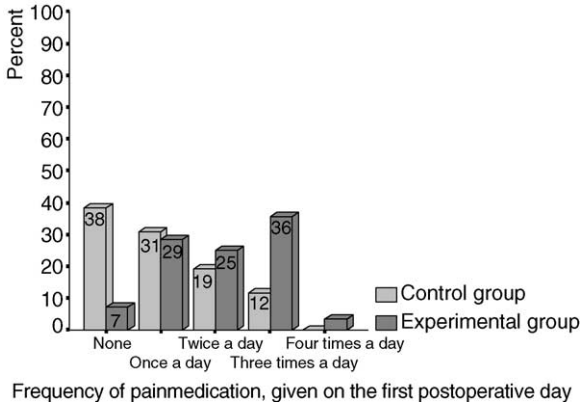

Fig. 5. Frequency of painmedication at home on the first postoperative day.

3.1.4. Second day at home

On the second postoperative day, no more significant differences in the assessments of the experimental group and control group were found.

3.2. Quality of sleep and play

On the first and second day after the procedure, there was no significant difference between the sleep quality of the experimental group and the control group (respectively, P = 0.49 and 0.86).

On the first postoperative day, a significant difference has been found concerning quality of play. The Mann–Whitney test shows that the children in the experimental group had significant worse quality of play than the control group (P = 0.02; $z = -2.193$) (see Fig. 3).

There was no significant difference anymore on the second postoperative day.

There was a significant relation between pain-intensity and the negative quality of sleep and play.

3.3. Pain medication

In the *postanesthesia care unit*, more children age 10–14 years in the experimental group received pain medication than the control group (P = 0.04; χ^2 = 3.99) and more frequently (P = 0.03; $z = -2.08$).

On *the first day at home*, significantly more children in the experimental group received oral ibuprofen as pain medication than the control group (P = 0.006; χ^2 = 7.651) and also more frequently (P = 0.002; $z = -3.083$) (see Figs. 4 and 5).

After sub-analysis, we found that in the group of children from 0 to 4 years as well as in the group of 10–14 years old, the experimental group received significantly more frequently pain medication (oral ibuprofen) than the control group (respectively, P = 0.05; $z = -1.936$ and P = 0.01; $z = -2.51$).

On the *second postoperative day*, no more significant differences between the two groups were found.

In order to test whether the scores of the children, parents and investigator were similar and comparable, correlations were performed. Between the scores of the parents and the children, a positive significant correlation was found (ρ = 0.82; P = 0.0001). Also, the assessments of the investigator and the children as well as the parents were positively correlated, respectively, ρ = 0.48; P = 0.0001 and ρ = 0.54; P = 0.0001.

4. Discussion

The children in the experimental group required pain medication more frequently than the control group. These unexpected results were found from the second postoperative hour on. In order to differentiate this observation, the patients were divided into three subgroups according to age. From analysis of the results of these three groups, the children of 10–14 years were found to experience more pain. A possible explanation would be that older children are able to score their perception of pain different than smaller children. Clinical studies have illustrated that age is a predictor for postoperative pain [12,13]. These studies have shown that children in their puberty (10–14 years) who are submitted to an ambu-

latory surgical procedure complain more quickly of severe pain than younger children (0–9 years).

Another explanation could be according to the study of Jamali and Kunz-Dober [14]. They found evidence that pain or trauma, caused by the surgical procedure, results in pathophysiological changes that can lead to less effectiveness of the oral pain medication, with lower and delayed peak drug blood levels. Whether the administration of ibuprofen together with other medications can cause loss of therapeutical activity needs to be further investigated.

The type of anesthesia also might have had an influence on postoperative pain. In this study, a difference in pain experience from the patient groups may be explained by the type of local or locoregional anesthesia. The children under 30 kg of bodyweight received a caudal block by the anesthesiologist. This type of anesthesia is locoregional and therefore more active centrally and complete. The children heavier than 30 kg received local anesthesia by the urologist during the procedure. With the administration of only a local anesthetic, there is more chance that a part of the surgical area is not adequately anaesthetized. Local anesthetics were used in older children and it is necessary to consider this as a possible explanation when interpreting the increased pain seen in the 10–14 year age group. This issue was not anticipated when we started the study.

Another problem for drawing any conclusion from this study is that there no power analysis was done, to sure that enough subjects were included. It was anticipated to find a significant difference between the experimental and the control group because the study was performed by a dedicated observer. However, this was not correct.

The assessments of pain, discomfort, sleep and play quality made by the parents, the children themselves as well as those of the investigator were concordant and were considered therefore as a good tool to assess the influence of medication in the short-term postoperative period. In addition, the investigator as well as the parents and the children were measuring the same phenomenon and therefore we can conclude that the method of measurement was correct. The quality of play and sleep correlated negatively to the intensity of the children's pain.

In conclusion, older children (10–14 years) who undergo ambulatory genito-urinary surgery with local anesthesia required more postoperative analgesia than was provided by this regimen. The older children who received preoperative oral ibuprofen (10 mg/kg) demonstrated significantly more pain early postoperative and on the first day at home. This study did not show a difference in postoperative pain, nausea and vomiting, or sleep and play quality up to 2 days after surgery that could be attributed to preoperative oral ibuprofen; however, this may be related to the few patients studied. The children's and parents' assessments of pain using the face scale and the investigators' assessments using the CHEOPS scale were comparable.

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Review

"Best practice" in day surgery units: a review of the evidence

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Abstract

We summarise the available evidence in three published systematic reviews examining: (i) pre-admission procedures; (ii) admission procedures and (iii) staffing policies in day surgery. Overall, there was a paucity of high level evidence. We found that: (i) a pre-admission intervention can improve patient and surgery outcomes, although the most effective type of intervention should be further investigated; (ii) distraction can reduce patient pre-operative anxiety and (iii) there is no high quality evidence relating skill mix, staffing levels and desired health outcomes in day surgery units. We make a range of recommendations based on lesser evidence, particularly concerned with admission procedures, and suggest areas of future research.

Keywords: Day surgery; Evidence based practice; Pre-operative care; Intra-operative care; Staffing levels; Skill mix; Nursing

Contents

1. Introduction

Day or ambulatory surgery is performed without overnight admission of the patient prior to or following the intervention. A wide variety of procedures are performed as day surgery including, but not limited to, ear, nose and throat surgery, gynaecological and orthopaedic procedures, and gastrointestinal and plastic surgery. Patients undergoing day surgery in Australia may attend day surgery centres, either stand alone or associated with a hospital, a ward in a hospital dedicated to day surgery cases, or a smaller specialised centre such as an

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endoscopy clinic. All of these institutions can provide high standards of care.

Since the 1970s, there has been a dramatic increase in the number of procedures that are carried out as day surgery, so much so that across developed countries it is estimated that day surgery now accounts for between 50 and 80% of all surgical procedures [1–3].

Day surgery offers many advantages to traditional inpatient services: a faster throughput of patients and a fixed time for surgery, reduced demand for night and weekend nursing staff, reduced waiting lists, savings in hospital costs, a shorter wait for children and older people, minimal disruption of normal routine, and reduced costs for the family of the patient [4,5]. However, there are also disadvantages to day surgery such as: nausea, vomiting and other complications if patients are discharged too soon after anaesthesia, inadequate pain control, insufficient rest at home and an extra burden being placed on family members and community services. These possible complications make it especially important that all aspects of day surgery are carried out as meticulously as possible. Such aspects include pre-operative care, care during surgery, and post-operative care including monitoring and assessment, discharge, and follow up via phone post-discharge. All of these elements are considered crucial for the delivery of high quality care and the achievement of positive surgical outcomes for the client.

Additionally, the rapid expansion of day surgery has required novel thinking related to the appropriate mix of staff (i.e. the mix of skill, competence and qualifications of staff). In response to advances in surgical and procedural techniques, increased expectation of patients and societal demands for cost containment new roles suited to day surgery have emerged, such as operating room assistants and anaesthetic technicians [6,7]. Although there may be the misconception that day surgeries only deal with minor surgery, the reality is that more complex surgery is commonly performed [8] and therefore staffing levels and mix must be able to meet these demands.

In Australia, there are guidelines available for accreditation of day surgery units but there are no evidence based best practice guidelines for pre-admission and admission care provided to patients in a day surgery unit. Nor are there any best practice guidelines for adequate and appropriate staffing levels for day surgery units. To redress this imbalance and provide material suitable for best practice guidelines, we undertook systematic reviews on each of these topics, and the results from these three systematic reviews are summarised here.

2. Methods

The systematic reviews were performed by a team of investigators from La Trobe University, the Joanna Briggs Institute and the Day Surgery Special Interest Group of Victoria. A review consultant with expertise in conducting systematic reviews was appointed for each of the three reviews and an expert panel was established for each review to give advice and guidance to the research team. The membership of the expert panel included nursing, medical and relevant stakeholders such as management personnel. The panel met monthly to review progress. The final meeting of each panel focused on the development of best practice guidelines arising from the systematic review.

Three systematic review protocols were developed:

- The pre-admission care of patients undergoing day surgery.
- The care of patients whilst in the day surgery unit.
- Appropriate staffing models to achieve desirable health outcomes in day surgery units.

The systematic reviews were conducted using an approach based on the Cochrane Collaboration and further developed by the Joanna Briggs Institute (e.g. [9]). The classification system of the Australian National Health and Medical Research Council [10] was used to assess the different levels of evidence (Table 1).

Table 1
The designation of the levels of evidence according to NHMRC guidelines [10].

Level	Source of evidence
I	Evidence obtained from a systematic review of all relevant RCTs
II	Evidence obtained from at least one properly designed RCT
III (1)	Evidence obtained from well-designed controlled trials without randomization
III (2)	Evidence obtained from well-designed cohort or case-control analytical studies preferably from more than one centre or research group
III (3)	Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments
IV	Opinion of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees

3. Results

Overall, there was a paucity of relevant research, the majority of which was low quality, in each of the fields in which systematic reviews were undertaken (Table 2). No systematic reviews have been previously conducted on these topics, as shown by the absence of Level I evidence. In many cases guidelines were included as expert opinion (the lowest level of evidence, Level IV) in areas lacking primary research, or to support the findings of qualitative studies. A large number of extracted studies that did not meet the inclusion criteria were excluded from the systematic review. The results for each systematic review are presented separately below.

Table 2
Summary of the literature reviewed in three systematic reviews of day surgery

Review Title	#Studies included	Level of evidence				#Studies excluded
		I	II	III	IV	
(i) The pre-admission care of patients undergoing day surgery...	6	0	1	2	3	50
(ii) The care of patients whilst in the day surgery unit...	19	0	1	2	16	91
(iii) Appropriate staffing models to achieve desirable health outcomes...	6	0	0	0	6	49

3.1. The pre-admission care of patients undergoing day surgery

The review uncovered one randomised-controlled trial (RCT) and five other studies of lower level evidence (three descriptive studies, one case control study and one cohort study) [11].

Most of the available research focused on what sort of information could be provided to patients before admission to day surgery. A few studies tested the effectiveness of interventions, with effectiveness variously measured as patient satisfaction, reduced cancellation rates, and the reduction in anxiety levels of patients and families. Two effective interventions were the use of pre-operative telephone screening or questionnaires [12], and a pre-admission appointment a few days prior to admission [13]. Both of these interventions were used to prepare both adults and children for their upcoming operation, and to create an opportunity for nurses to screen those who may be in a position where surgery should be postponed. In comparison, a home visit programme following up from a previous telephone call was no more effective than the telephones call itself in reducing cancellation rates [14].

Although there is little research into the suitability of pre-admission screening criteria, guidelines by the Association of Anaesthetists of Great Britain and Ireland indicate that the patient's willingness to have day surgery, availability of adult care in the home, telephone access and general home situation should all be considered prior to admission. They also indicate that the patient should have the ability to understand the procedure, be in good physical health and be of reasonable weight.

3.2. The care of patients whilst in the day surgery unit

The evidence base regarding admission and patient care whilst in day surgery is based on relatively little primary research [9]. This systematic review uncovered one RCT that could be included as part of the review [15]. This RCT focused on the effectiveness of a relaxation session in distracting patients and reducing patient anxiety and intra-operative anaesthetic requirements. There were 15 other studies (11 descriptive studies, one case control study, one qualitative study, one grounded theory study and one hermeneutic phenomenological study) included in the review. Guidelines produced by the Association of Anaesthetists of Great Britain and Ireland, the Audit Commission of England and Wales and the Royal College of Anaesthetists and the Royal College of Ophthalmologists were included as expert opinion in areas were there was found to be no primary research or to support the findings of qualitative studies.

The use of distraction (music and short stories delivered by personal stereo systems) to reduce pre-operative anxiety and intra-operative anaesthetic requirements was supported by high level (Level II) evidence [15]. In terms of local and general anaesthesia, strict adherence to traditional fasting prior to surgery is no longer considered necessary [9]. A majority of anaesthetists would allow a patient undergoing general anaesthesia to consume clear liquids up to 2 h before surgery, a light breakfast 6 h before surgery and solid food up to 8 h before surgery [16]. This finding is also supported by expert opinion for local anaesthesia [17].

In terms of patient discharge, the evidence indicates that tympanic temperature is not a suitable discharge criterion [18]. However, the post-anaesthetic discharge scoring system (PADSS) is a useful criterion, and provided close correlation with results using existing clinical discharge criteria [19].

Although, the vast majority of evidence examining other aspects of patient care in day surgery units was based on the lowest level of evidence (Level IV), patient dissatisfaction in several of these areas was clearly identified. For example, patient satisfaction in the area of admission care was found to be inadequate. Additionally, information prior to surgery did not meet patient needs in terms of preparing them for what to expect from the operation itself, admission care and discharge. Waiting times were seen as unnecessarily long. Patients found that nursing staff dismissed their fears of surgery and anaesthesia rather than adequately dealing with concerns and providing reassurance [9].

3.3. Appropriate staffing models to achieve desirable health outcomes in day surgery units

The systematic review of evidence on this topic revealed an absence of well-designed studies examining effective staffing models [20]. There is little evidence, other than that drawn from expert opinion, to suggest optimal staffing levels in day surgery. The available evidence is largely drawn from expert opinion in general surgical theatres, not day surgery facilities. A number of guidelines examine staffing needs in day surgery and make recommendations on the levels of staffing and skill mix. These guidelines are mainly related to the traditions and/or common practice of the originating country [21,22].

There is no high quality evidence on the effectiveness of Registered Nurses as surgeon's assistants in day surgery units or the role of first and second level nurses and theatre technicians. There is no evidence to indicate the impact of these changes in skill mix on quality and outcomes. Expert opinion suggests minimum staffing levels and identifies specific activities that should be seen as legitimate use of staff time.

4. Discussion

The results of each systematic review will be discussed on their own before a short summary of the available evidence for best practice in day surgery and suggestions for future research.

There are two types of pre-admission care that are considered best practice and have been shown to be useful in improving the pre-admission process for both patients and the day surgery unit. Pre-operative telephone screening or questionnaires, or a pre-admission clinic are considered best practice in preparing both adults and children patients for day surgery. Telephone calls are particularly useful in reducing patient cancellations and non-compliance with pre-admission procedures, and create an opportunity for nurses to screen those whose surgery should be postponed [12]. The evidence indicates that there is no reduction in cancellation rates from following up a telephone call with a home visit. The additional cost of a home visit is not warranted [14]. The value of pre-admission clinics is mainly seen in better patient outcomes, although there were no comparative trials of pre-admission clinics, surveys of patients using a pre-admission clinic demonstrated a high level of patient satisfaction [13,23]. Patient anxiety and state of mind were improved, understanding of the admission process, the importance of fasting before surgery and satisfaction with aftercare instructions were all found to have also increased with the provision of pre-admission clinics.

Although desirable, it is not possible to compare the effectiveness of pre-admission clinics and pre-operative telephone calls in providing positive outcomes for both patient and day surgery unit, as no comparative study has yet been undertaken. Although the evidence presented here is the best available, particularly for examination of the pre-admission clinic and screening criteria, it is not particularly high level evidence (Level III (2) and Level IV, respectively). There are no studies that have looked into the use of other educational tools to prepare patients for admission to day surgery. While there was a suggestion that patients would like to receive video and booklet style information, there were no studies that specifically researched this area.

The second systematic review revealed several interesting factors relating to the care of patients in the day surgery setting. Distraction, via music or short stories, was shown to reduce patient pre-operative anxiety across a range of anxiety indicators at a high level of evidence (Level II, [15]). A reduction in anaesthetic dose and settling time was another benefit of the distraction. This evidence is superior to a lower quality study that showed no effect of distraction on anxiety, using less sophisticated measures of anxiety [24]. We feel that these results confirm the efficiency of a range of distractive measures that are used in the day surgery setting, and suggest that the best practice in day surgery waiting areas is to provide access to such material (e.g. music, television and magazines) where possible.

In terms of anaesthesia, descriptive studies and expert opinion indicate that traditional fasting regimes prior to surgery are no longer necessary for patients undergoing procedures involving local or general anaesthetic. The recommendations of reduced fasting times compared with traditional regimes were first formalised in 1999, at least for general anaesthetic in the United States [25], and have been adopted by the majority of practitioners there in a relatively short space of time [16]. Despite the low level of evidence base, it is apparent that best practice allows for clear liquids 2–3 h before an ambulatory surgery procedure and a light breakfast up to 6 h before surgery. In cases of ophthalmic surgery, where patients are often elderly, anaesthetists claim to be more concerned about the undesirable effects of thirst, nausea and hypoglycaemia that may occur in the absence of oral intake.

Although uptake of the anaesthesia guidelines by practitioners has been rapid, it is apparent that many institutions still have outdated guidelines in place [9]. These need to be changed to reflect changes to practice, and new findings in relation to oral intake and anaesthesia.

The finding that PADSS is a reliable discharge tool indicates that it could be used instead of existing clinical discharge criteria. The PADSS does not require patients to tolerate fluids orally or to have voided prior to discharge. The implications are that under PADSS, patients would be discharged earlier, resulting in an improvement of cost effectiveness with no change in patient outcomes.

The final major finding from the second systematic review was that patients expressed a high level of dissatisfaction with a range of aspects of the day surgery experience. Patients felt that information provided prior to surgery was inadequate and failed to meet their needs in terms of preparing them for what to expect. Information relating to their specific operation, and day surgery in general should be provided—especially in regards to pain and discomfort that might be experienced as patients cope better when prepared for a situation. As information about discharge was a particular area of concern, written information on maintaining personal hygiene, pain relief and pain management and emergency contacts should be provided, so that patients feel confident about caring for themselves at home. Surgery with the least complications should be scheduled for later in the day and better screening and planning should be implemented to ensure that patients do not require overnight admission following a failure to organise transportation home or someone to assist in caring for them.

The third systematic review on appropriate staffing models provided the least amount of evidence. It reviewed the growing body of literature on staffing models in day surgery and documented the establishment of specific roles to improve the pre-admission, admission and discharge processes. There is a distinct lack of quantitative evidence to show whether these staffing models generate best practice. There is no high quality evidence to establish the relationship between skill mix, staffing levels and the achievement of desired health outcomes in day surgery units. It is apparent that practices related to calculating and providing appropriate staffing in day surgery units to ensure best practice have yet to be evaluated in terms of their effect on costs and outcomes.

The lack of studies addressing the complexity of staffing issues in the day surgery unit results in decisions being made based on the number of patients through, rather than complexity of case. An over-reliance on tradition and the maintenance of professional boundaries appears to characterise current approaches to skill mix and staffing levels in day surgery units [20].

5. Summary

Day surgery is an area of expertise still in its relative infancy, having only become prevalent in the last thirty years. It is therefore perhaps not surprising that three systematic reviews of day surgery have revealed many gaps in our current evidence base of ambulatory surgery. The present study proposes four key issues that should be priorities for further research.

1. Many day surgery centres have implemented a system of undertaking pre-admission assessments/interviews in clinics and or via telephone. The most effective form of pre-operative intervention, which maximises patient and day surgery outcomes is unknown and should be further investigated.
2. Early discharge of patients is one of the cost saving advantages of day surgery, but it can also be a cause of complications and deleterious outcomes. Further research into discharge criteria, especially PADSS, which is in common usage, should be undertaken.
3. Areas of admission care that have not been researched, or have only been researched poorly: e.g. intra-operative care itself, management of the operative environment, management of post-operative nausea and vomiting, infection rates, readmission, healing, perceived independence and cancellation rates require further investigation.
4. The rapid expansion of day surgery has impacted upon the decisions related to the appropriate mix of staff including the mix of skill, competence and qualifications of staff. The need to generate substantive evidence on which to base staffing models in day surgery units requires high quality research to generate a sound evidence base.

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Nurses versus clinicians—who's best at pre-operative assessment?

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Abstract

Previous studies have emphasised the lack of relevant medical history information available for patients attending for surgery. The records of 57, consecutive patients attending the nurse-led Pre-Admission Clinic (PAC) at the Oral Surgery Day Case Unit at Newcastle Dental Hospital were reviewed to determine whether nurses or clinicians were best at identifying potential medical problems. For 22 patients, nurse-led PAC interview revealed additional information not recorded by clinicians, most frequently cardiovascular disorders (9), arthritis (5) and drug allergies (2). Pancreatitis, epilepsy, recurrent epistaxis and a history of a fractured mandible were other conditions only identified following nurse consultation. Medical history taking by nurses at PAC thus provides an important screening function prior to successful ambulatory surgery.

Keywords: Day surgery; Pre-Admission Clinic; Nurse-led

1. Introduction

A nurse-led Pre-Admission Clinic (PAC) was introduced in the Oral Surgery Day Unit at Newcastle Dental Hospital in 1996 in order to help reduce patient failures and cancelled operations on the day of admission. Following initial consultation, patients requiring day surgery are referred to PAC for pre-operative assessment 2–3 weeks prior to operation.

Using an established code of practice and anaesthetic guidelines, PAC has improved both patient assessment and education prior to oral day surgery [1,2]. In many hospitals pre-operative assessment has been largely taken over by trained nurses, who have been shown to perform as effectively as pre-registration house officers [3].

Previous studies of PACs have emphasised the lack of relevant information in both general practitioner referral letters and surgical out-patient histories when patients are referred for assessment before surgery [4].

Review of patients' medical histories is an integral part of our PAC process [1], and we have gained the impression that patients often reveal more details of their medical histories during nurse-led PAC consultations than when first interviewed by clinicians at out-patients. A standardised questionnaire is used by the PAC nurse to carry out a comprehensive medical review. It includes 32 specific 'YES/NO' general health questions together with space to record relevant details and any additional information (Table 1).

Most clinicians concentrate on the presenting complaint and tend to seek additional information about patients' general health in an unstructured manner, often recording their findings in a relatively unorganised fashion in the medical records.

We decided to review the clinical records of a series of consecutive patients attending for day case oral surgery, to compare the medical histories obtained by clinicians with those recorded by the nursing staff, with a view to determining which group was better at identifying medical problems.

2. Results

Fifty-seven consecutive hospital records were obtained for patients attending nurse-led PAC during a 3-month period

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Table 1
PAC general health proforma

		Yes √	No √	Details
1.	Do you suffer from or have you had any serious illnesses?			
2.	Have you had an operation before?			
3.	Did you have any problems with the anaesthetic?			
4.	Has any member of your family had problems with an anaesthetic?			
5.	Have you any allergies (eg drugs or elastoplast)?			
6.	Are you on any regular medication?			
	FOR FEMALE PATIENTS ONLY:			
7.	Is it possible that you may be pregnant? Date of your last period:			
8.	Are you taking the contraceptive pill?			
	Do you suffer from or have you ever had any of the following?			
9.	Chest pain on exertion or at night?			
10.	A heart attack or heart murmur?			
11.	A stroke or mini stroke?			
12.	Swollen ankles?			
13.	High Blood Pressure?			
14.	Breathlessness? Asthma □ Bronchitis □			
15.	Do you have blackouts or faint easily?			
16.	Have you ever had a fit or a convulsion?			
17.	Do you have any blood disorders?			
18.	Do you bleed badly or bruise without cause?			
19.	A history of thyroid disease or treatment?			
20.	Kidney or urine problems?			
21.	Jaundice?			
22.	Diabetes?			
23.	Bowel problems?			
24.	Heartburn or indigestion?			
25.	Gastric/stomach ulcers?			
26.	Any type of hernia?			
27.	Problems with mobility?			
28.	Muscle Disease?			
29.	Back problems or neck problems?			
30.	Arthritis?			
31.	Do you drink alcohol? How much?			
32.	Do you smoke? How many per day?			
	Additional Information			

between September and December 2002. All patients were initially seen in consultation clinics within the Oral & Maxillofacial Surgery department at Newcastle Dental Hospital for diagnosis and treatment planning. Twenty-five male and 35 female patients with an age range of 5– 67 years were included in the study. Fig. 1 illustrates their age distribution.

Table 2 summarises the surgical procedures undertaken in this group of patients; the majority attended for surgical removal of teeth (most commonly impacted third molars), whilst others underwent detailed examination or required biopsy or excision of various oro-facial lesions. All procedures were carried out under general anaesthesia.

In 22 patients (39%), the nursing staff in the PAC identified additional medical information which had not been recorded

Table 2
Surgical procedures

Operation	No. of patients	Percentage
Surgical removal of teeth	43	75
EUA oropharynx and biopsy	9	16
Excision facial skin lesions	5	9

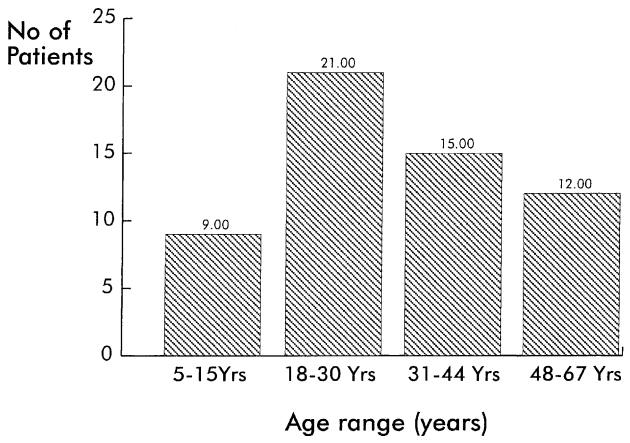

Fig. 1. Patient age distribution.

by clinicians, most commonly relating to cardiovascular disorders (nine patients) or arthritis (five patients) together with two cases of undisclosed drug allergy (Table 3).

The majority of patients were seen in the clinic by consultant oral and maxillofacial surgeons, but a proportion were 'clerked' by experienced 'middle-grade' clinicians (specialist registrar or clinical lecturer) with a smaller number assessed by house officers (Table 4).

Of the 22 patients from whom additional medical details were obtained at PAC, most had been seen initially by 'middle grade' clinicians (Table 5).

Table 3
'Additional' medical information obtained at nurse-led PAC

Medical problem	No. of patients
Cardio vascular disease	
Hypertension	4
Ischaemic heart disease	3
Heart failure	1
Anaemia	1
Skeleto-motor disorders	
Arthritis	5
Drug allergies	2
Head and neck problems	
Recurrent epistaxis	1
History of fractured mandible	1
Others	
Recurrent pancreatitis	1
Epilepsy	1
Obesity	1
Anxiety disorder	1

Table 4
Who saw the patient initially?

Grade of clinician	No. of patients	Percentage
Consultant Oral & Maxillofacial Surgeon	33	58
Registrar/Lecturer in Oral & Maxillofacial Surgery	16	28
SHO/House Officer	8	14

Table 5
Who 'missed' the medical data?

Grade of clinician	No. of patients	Percentage
Registrar/Lecturer in Oral & Maxillofacial Surgery	16	73
Consultant Oral & Maxillofacial Surgeon	6	27
SHO/House Officer	0	0

3. Discussion

Nurse-led PAC has proved popular with patients and staff within our day unit and is clearly effective in medical screening of patients [2]. It is interesting to note both the number and range of additional medical details obtained at PAC (Table 3), but it remains unclear why patients volunteer more information during nurse consultation.

It is noteworthy that four cases of hypertension were identified at PAC. High blood pressure has been reported to occur in 13% of patients in a dental hospital setting [5,6], and is clearly a significant pre-operative finding. All patients attending PAC are screened for hypertension by measurement of their blood pressure on three separate occasions. If necessary, patients are referred back to their general medical practitioner for further measurement – in a more familiar environment – and for treatment.

Other potentially important conditions not noted by the clinicians included histories of chest pain and drug allergy. We found it particularly surprising that in two patients, maxillofacial staff had apparently overlooked recurrent epistaxis and a previous mandibular fracture!

Not all the patients who revealed a history of medical problems required intervention, nor was all the additional information obtained at PAC necessarily of operative or anaesthetic relevance, but it is interesting to speculate why patients provide more information to nursing staff. A number of factors may contribute to the apparent increased reliability of PAC:

1. *Time available*: PAC appointments are booked at 30 min intervals. Whilst an interview with a generally fit patient may take significantly less time, this is nonetheless considerably longer than most clinic appointments, which generally last only 5–10 min. This lack of time pressure probably encourages a more relaxed and discursive approach to interview.
2. *Structured questionnaire*: This is designed to collect all potentially relevant information, and specifically, to identify conditions that the anaesthetist should be informed about prior to surgery. It may be that by combining general questioning with specific systems review PAC acquires additional patient information, although this may be less appropriate for patients with complex medical backgrounds.
3. *Purpose of visit*: PAC appointments are designed with the specific purpose of ensuring patients' fitness for general

anaesthesia. In contrast, maxillofacial clinicians are concerned primarily with clarification of the presenting complaint and treatment planning.

4. *Patient–staff relationships*: It is probably the case that patients feel more at ease conversing with a nurse rather than the clinician planning their surgical treatment. This may be helped by nurse communication skills, more general discussion of health issues (as opposed to focusing on specific problems) and patients feeling more relaxed about both answering and asking medical questions.
5. *Organisation of PAC appointment*: By the time patients reach PAC they have usually had time to think about their initial meeting with the clinician. It is well recognised that many patients are unable to recall a significant part of their discussion with a clinician (perhaps because of anxieties over hearing a potentially adverse diagnosis) and the opportunity for reflection before attending PAC may encourage them to talk more freely.

It is interesting that whilst the majority of patients (33) were initially seen by consultant oral & maxillofacial surgeons, it was within the 16 patients 'clerked' by 'middle-grade' clinicians that most additional medical data was discovered at PAC. The most junior clinicians saw fewer patients (8) but appeared to miss no medical details (Tables 4 and 5).

Specialist registrar and clinical lecturer staff are likely to have more knowledge than house officers and are usually more familiar with clinical problem solving and treatment planning. This means they usually work at a faster pace and see more patients. Perhaps the relative lack of experience of these 'middle-grade' clinicians, compared with consultant staff, may account for the unusually high number of medical details missed in their patients (Table 5).

4. Conclusions

Nurses and clinicians working together and utilising their complementary skills are essential features of modern ambulatory surgery. We believe this study clearly demonstrates that PAC provides a reliable and efficient means of pre-operative assessment. Not only does it improve theatre utilisation (by minimising non-attendance of patients) but it also helps to ensure that significant details of patients' histories are not overlooked. In this way, nurse-led PAC undoubtedly contributes to greater patient safety during anaesthesia and surgery.

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Umbilical pilonidal sinus Ambulatory surgical technique

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Abstract

Hypothesis: Umbilical pilonidal sinus, although uncommon, can become complicated by inflammation, cellulitis and suppuration. Usually it tends to recur after conservative treatment. Various surgical procedures have been suggested for its treatment, but most of them were based on experience with few cases.

Our aim is to describe a modified surgical technique at the day-hospital for the treatment and prevention of recurrent disease.

Design: Retrospective case series.

Settings: Unit of ambulatory surgery, regional day-hospital.

Patients and surgical technique: Twelve consecutive cases of umbilical pilonidal sinus were treated at our hospital by subcutaneous excision of the involved tissue and the deep portion of the umbilicus. The operation was performed under general anesthesia. All the patients were discharged at 5–6 h after surgery.

Results: Minor complications were encountered in two cases: seroma and hyperaemia of the skin treated conservatively at out patient clinic. No recurrent disease was found in two years of follow up. All the patients were satisfied with the cosmetic results of the procedure. This technique was cost effective since it was carried out as an ambulatory procedure.

Conclusions: A simple surgical technique for the treatment of umbilical pilonidal sinus is proposed. Besides its satisfactory results in eradicating the disease it is cost effective.

Keywords: Umbilicus; Pilonidal sinus; Surgery

1. Introduction

Pilonidal sinus is an acquired disease caused by hair penetrating the skin, a foreign body reaction and the development of a sinus lined by granulation tissue.

Although the sacrococcygeal area (or internatal cleft) is the commonest site for pilonidal sinus, it has been described in unusual sites such as: the umbilicus, interdigital clefts in barbers, healed mid-thigh amputation stumps, the axilla, the presternal area, the clitoris and mons pubis, the shaft of the penis, the ear lobe, the sole of the foot, the nipple, the posterolateral abdominal wall, the brow and the upper eyelid [1–8].

The umbilical pit is a natural receptacle where hairs can lodge, especially, in young obese hirsute adults with poor personal hygiene. It is more common in male subjects [9,11]. The resulting inflammation of the sinus may extend beyond the subcutaneous fat to the peritoneum [10,12].

Conservative, non-surgical, treatment of umbilical pilonidal sinus consists of removal of the hair tufts, shaving the area around the umbilicus and careful cleaning of the umbilicus. Since the conservative treatment depends mainly on the patient's cooperation, it usually fails and surgical excision of the umbilicus becomes unavoidable. Elliptical excision of the umbilicus and the involved subcutaneous tissue, with or

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without reconstruction of the umbilicus, is an acceptable surgical procedure [11,13,14].

We propose a simple ambulatory surgical procedure which, in our experience, was effective in eradicating the disease in 12 cases.

2. Patients and methods

Twelve cases of umbilical pilonidal sinus were treated at our day-hospital during the period 1998–2002 (5 years). The patients comprised 8 men and 4 women (Table 1). Their ages ranged from 18 to 30 years. All complained of a discharging umbilicus, 11 patients had local pain, 2 had recurrent umbilical abscesses and repeated incisional drainage, and 2 patients had recurrent bleeding. The duration of their symptoms varied from two months to nine years. Patients were referred to surgery only after the failure of conservative treatment. All patients underwent elective surgery under general anesthesia and were discharged from the hospital at 5–6 h postoperatively. Follow-up in the outpatient clinic for two years after surgery showed no recurrent disease. Postoperative complications were seen only in two patients: one had a serosanguinous discharge from the umbilicus and the other had a mild peri-incisional hyperaemia. Both were controlled by conservative treatment which included antibiotics and dressings, and subsided within 10 days.

All the patients were satisfied with the cosmetic results of the operation. In our opinion, the resulting shallow umbilical pit was the basis for recurrence prevention, since it is easier to be kept clean and dry.

2.1. Surgical technique

Transverse incision 2 cm below the umbilicus through the subcutaneos fat towards the anterior sheath of the rectus abdominis. Dissection of the subcutaneous tissue around the umbilicus and its deep connection to preperitoneal fat through the linea alba. Excision of the umbilical complex 3–5 mm below the umbilical ostium.

Table 1
Data on 12 patients treated for umbilical pilonidal sinus

Age	Gender	Pain	Discharge	Bleeding	Duration	Abscess
20	F	+	+	–	12 Months	
30	F	+	+	–	9 Years	Recurrent
20	M	+	+	–	2 Months	
23	M	+	+	–	6 Months	
28	M	+	+	–	6 Months	
27	M	–	+	+	2 Years	
19	M	+	+	–	1 Years	
26	F	+	+	–	3 Years	
18	F	+	+	–	2 Years	Recurrent
23	M	+	+	–	4 Years	
24	M	+	+	+	2 Years	
26	M	+	+	–	3 Years	

Closure of the umbilicus with subdermal interrupted absorbable sutures.

Approximation of the subcutaneous tissue with interrupted absorbable sutures.

Closure of the skin incision with skin stapler.

The specimen, including the umbilical complex (skin and subcutaneos tissue), was transferred to department of pathology for histopathological examination.

2.2. Pathology

The histopathologic features of an umbilical pilonidal sinus were seen in all the specimens and included sinuses lined with granulation tissue and containing hair shafts. The sinuses were surrounded by reactive inflammatory cells. In one case with a history of recurrent abscesses, no hair shafts were seen, but there were sinuses lined with granulation tissue and surrounded by a reactive inflammatory process. The sinuses extended through the surrounding fat tissue for 1–3 cm from the sinus orifice at the umbilical skin.

3. Discussion

Umbilical pilonidal sinus is a rare disease and fewer than twenty cases were reported before 1980 [9]. It is considered an acquired disease and its aetiology does not differ from that of the more common pilonidal sinus in the sacrococcygeal region. Hirsutism, obesity, poor hygiene, deep navel and hot climate, all play a role in its aetiology. It is more common in young males (age 20–35 years) than in females. The rarity of umbilical pilonidal sinus compared with sacrococcygeal disease is believed to result from the hardness of the umbilical cicatrix and less effective driving force [10].

Unless it is complicated by cellulitis or suppuration, the patient may seek medical consultation only in the chronic phase of the disease. Extension of the inflammatory process to the peritoneum has been reported [10,12].

The potential for peritonitis in patients with umbilical pilonidal sinus often warrants surgical intervention. When suppuration is present, incision and drainage is required. Conservative treatment of a pilonidal sinus that consisting of removal of hair tufts, cleaning the umbilical pit and shaving the area of umbilicus may relieve the symptoms but does not cure the disease. Aggressive omphalectomy with omphaloplasty or leaving the wound open to heal by secondary intention, usually necessitates expensive hospitalization [11].

Elective ambulatory surgery and close follow-up was carried out in the treatment of 12 cases with umbilical pilonidal sinus. A simple surgical technique: excision of the deep part of the umbilicus with the adjacent subcutaneous tissue and primary closure of the wound and the remnant of the umbilicus, was introduced in all our cases. Good results were achieved: no recurrent disease in two years of follow-up and acceptable shape of the partially preserved umbilicus, as it is shallow and easy to clean. This technique is cost

effective: ambulatory compared to hospitalization of 4 days [11], shorter postoperative home rest when the wound is closed primarily.

In conclusion the surgical technique reported here is simple, cost effective, and prevents recurrent disease.

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Direct access day-case hernia surgery: a logical option for reduction in waiting time

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Abstract

Introduction: Direct access day-case surgery is feasible in the management of symptomatic groin or para-umbilical hernia. With adequate coordination between the surgical team, GP and the patient, the average waiting time could be reduced without compromising quality of care.

Methods: A retrospective review of case notes of patients who underwent hernia repair, under the care of a single consultant surgeon was carried out. Between 1998 and 2002, a total of 427 patients had elective day-case hernia repair. Over this period 137 patients, who were chosen from the GP referral letter, underwent direct access day-case hernia sugery.

Results: Out of the 137 patients, 136 successfully underwent direct access day-case surgery. One patient was found to have no demonstrable hernia on the day of surgery and was discharged. The median waiting time for direct access hernia surgery was 69 days, less than half of those who were first seen in the clinic during the same period.

Conclusions: Current waiting time for elective day-case hernia surgery could be reduced significantly by direct access surgery. This seems to be the logical solution for reduction of waiting time without compromising the quality of patient care.

Keywords: Direct access surgery; Waiting time

1. Introduction

Increasing caseload in the National Health Service (NHS) is generating longer waiting times, both for elective surgery and for an out-patient clinic appointment. A significant number of patients attending general surgical out-patient clinics are fit and have simple surgical conditions which present little diagnostic difficulty. The total waiting time for elective operation in this group of patients is the waiting time for an out-patient appointment added to the time between this appointment and surgery. Direct access surgery has been shown to save time and resources in the out-patient clinic [1]. For routine elective hernia repair, a general practitioner (GP) usually sends a referral letter to a consultant surgeon who arranges a clinic appointment. The patient is then evaluated in the surgical clinic and, if found suitable, a day-case hernia repair is arranged. Following the out-patient visit, the patient makes a second visit to the pre-operative assessment clinic. Finally, they have a third visit to have their hernia operation. In our study, we examined the role of direct access day-case hernia surgery in reducing the overall waiting time.

2. Patients and methods

From 1998 onwards, all GP referral letters for elective hernia repair were screened by one consultant (H. R.-S.). Those with inguinal, femoral and para-umbilical hernias were included in the study. From the descriptions given in the GP letter, patients with symptomatic hernia were identified for direct access repair. Those with an uncomplicated hernia

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as described in the referral letter and likely to be American Society of Anaesthesiology grade I or II risk for general anaesthetic were offered direct access hernia surgery or an out-patient appointment. Once the patient was identified for direct access surgery, without prior clinic appointment, the GP and the patient were informed in writing. Patients were given the choice of a surgical out-patient clinic appointment if they had any issues to discuss or if they were not keen on direct access surgery. Patients were also given a choice to change the operation date to suit their convenience. Those with a recurrent hernia, a large hernia or at high risk for a general anaesthetic as described in the referral letter were invited for a routine clinic appointment first and then added onto the day-case waiting list as appropriate. If the referral letter was inconclusive the patient was invited to the clinic. All children were first seen in the out-patient clinic. All patients were evaluated in the pre-operative assessment clinic and assessed by a nurse practitioner on the week before their operation. On the day of surgery, all patients were examined and consented by the operating surgeon.

3. Results

Between 1998 and 2002, 427 patients underwent day-case hernia repair. Of these, 291 (68%) were first seen in the clinic and 137 (32%) were invited directly for day-case surgery. One patient in the direct access group did not have a demonstrable inguinal hernia and was excluded from the study. The age and sex distribution in both groups were comparable (Table 1). Inguinal hernia was the most common diagnosis in both the groups, which explains the small number of women in the direct access group. Femoral, para-umbilical and epigastric hernias were encountered in a small number of patients in each group (Table 2). Two patients in the clinic group had bilateral inguinal hernias and one in the direct access group. Eighteen patients in the clinic group had recurrent inguinal or para-umbilical hernias. Two of the direct access group were found to have a recurrent inguinal hernia, which was not specified in the referral letter. Their operations were carried out without any perioperative complications.

Table 1

	Clinic group (n = 291)	Direct access group (n = 136)
Mean age	39	44
Male:female	259:32	133:3

Table 2

Operative diagnosis	Clinic group (n = 291)	Direct access group (n = 136)
Inguinal	224	133
Femoral	1	1
Para-umbilical/epigastric	66	2

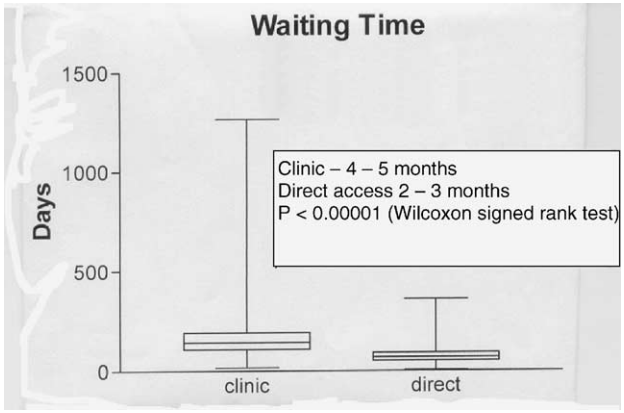

Fig. 1. Box plot shows the median (horizontal line within the box). Lower and upper margins of the box indicate the first (25%) and third (75%) quartiles, respectively. Lower and upper ends of the vertical line correspond to the minimum and maximum values (range).

The median waiting time for the patients in the clinic group to be seen in the routine surgical clinic was 83 days. They waited a further 57 days before having their operation. (Total median waiting time = 142 days.) Median waiting time in the direct access group was 69 days. ($P < 0.0001$ Wilcoxon Signed Rank Test, Prism software; Fig. 1.) None of the patients in either group required unanticipated hospital admission following the day-case surgery. One patient in the clinic group was readmitted a few days after operation, for evacuation of haematoma. There were no other major complications in either group. Five patients in each group had a minor wound infection, which was managed by the GP. There was no mortality in either group.

4. Discussion

Waiting time for an operation includes the time spent waiting for the out-patient appointment in addition to the actual waiting time for admission to the hospital to undergo the proposed operation. In our series, the median waiting time for an out-patient appointment was 83 days but during the period of the study the waiting time rose from 10 weeks before up to 26 weeks after the introduction of the “2 week rule” for cancer referrals. This is an unfortunate, but not an unexpected, result of the introduction of this guideline. About two-thirds of the total waiting time for this group of patients was in waiting for a clinic appointment. We have seen a greater improvement in access time than would be seen in the average department where only one-third of the total waiting time is spent waiting for an out-patient appointment [2]. Direct access surgery appointments have allowed other patients to be seen in the out-patient department, as the total number of patients seen in each out-patient clinic has not changed over the study period or since. In our study, this corresponds to 137 patient slots in a 4-year period (the number of patients who underwent direct access repair). Direct access service has been used successfully by various

specialities such as direct access gastroscopy by gastroenterologists [3], tonsillectomy by ENT surgeons [4] and oral surgery by the dentists [5]. In all specialities, the procedure to be performed is relatively simple and usually uncomplicated with a predictable outcome. Establishment of centralised services would enable the patient to be operated in any available list irrespective of the speciality, thus reducing the waiting time for high-volume routine surgical procedures [6].

One potential downside of "missing a clinic appointment" is the decreased interaction between the patient and the surgeon with only a short encounter preoperatively on the day of surgery. However, the patient is first counselled by their GP, then by the nurse at the pre-operative assessment clinic and, finally, by the surgeon on the day of operation. Although a formal audit was not carried out, none of our patients in the direct access group expressed any concerns and were happy about the shortened waiting time. It must be emphasised that the patient still retains the choice to have a formal out-patient appointment if they so wish. Approximately, three quarters of patients in this study were still seen in the conventional manner in the clinic and hence there was no major loss in the potential educational value. No patients were invited for routine follow up after surgery but a small number did return after initial consultation with their GP. We have now introduced online referral for direct access surgery to further shorten the referral time.

5. Note

This data was presented at the Annual Audit Symposium, Royal College of Surgeons of Edinburgh, March 2003, Annual Scientific Meeting of the Association of Surgeons of Great Britain and Ireland, May 2003 and as a poster at the Annual International Hernia Congress, London, June 2003. An abstract was published in *British Journal of Surgery*, vol. 90 (Suppl 1), June 2003.

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Use of video in flexible cystoscopy: a prospective randomised study of effect on patient experience

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Abstract

Objective: To determine whether the use of video during flexible cystoscopy affects patient experience and understanding of investigation findings.
Patients and methods: One hundred thirty five consecutive patients, listed for flexible cystoscopy, were randomised to two groups; cystoscopy with or without video viewing. Levels of patient anxiety, pain on scope insertion, pain during examination and understanding of examination findings were assessed by questionnaire.
Results: Pain scores during examination were significantly lower in the video group. There was a highly significant difference in patient's ability to correctly describe the findings favouring the video group.
Conclusion: Use of video during flexible cystoscopy improves patient understanding of examination findings and helps to alleviate pain during the examination.

Keywords: Flexible cystoscopy; Bladder; Patient empowerment

1. Introduction

Flexible cystoscopy under local anaesthetic has become a routine out-patient procedure. It has reduced the reliance on its rigid counterpart with its higher morbidity and longer hospital stay [1]. The use of a video screen allows the patient to gain a 'surgeons view'. The aim of this study was to examine whether video during cystoscopy would affect anxiety and pain experienced and also improve patient understanding of the findings.

2. Patients and methods

One hundred thirty five consecutive patients listed for diagnostic and follow up flexible cystoscopy were randomised into two groups prospectively; those offered a video monitor to view the procedure and those who were not. Both groups underwent a standard cystoscopy in day theatre performed by the same clinician using topical 2% lidocaine gel. Patients were then asked to complete a confidential questionnaire prior to leaving the day unit. This enquired about anxiety (four point descriptive score), pain on insertion of the scope, pain during examination (visual analogue score 1–10) and whether the patient understood the findings. Each patient was also asked to describe what was found. The doctor performing the procedure kept a logbook of the actual findings and these were compared with the questionnaires at the end of the trial. Due to skewed data distribution the Mann–Whitney and Fisher's exact tests were used for analysis (see Table 1).

3. Results

All 135 patients completed the questionnaire. The two groups were well matched for age and experience of flex-

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Table 1
Group details

	Video	No video
Number of patients	62	67
Mean age (years)	63.8	64.2
Diagnostic cystoscopy (*n*)	48	50
Follow-up cystoscopy (*n*)	14	17

Table 2
Pain experienced during cystoscopy (10-point analogue score)

Pain	Video (*N* = 62)	No video (*N* = 67)
Insertion		
None (1)	41.9% (26)	38.8% (26)
Mild (2–3)	35.5% (22)	35.8% (24)
Moderate (4–6)	17.8% (11)	23.9% (16)
Severe (7–10)	4.8% (3)	1.5% (1)
Examination		
None (1)	56.5% (35)	40.3% (27)
Mild (2–3)	35.5% (22)	40.3% (27)
Moderate (4–6)	6.4% (4)	14.9% (10)
Severe (7–10)	1.6% (1)	4.5% (3)

Table 3
Patient anxiety (4-point analogue score)

Anxiety score	Video (*N* = 62)	No video (*N* = 67)
None (1)	56.5% (35)	44.8% (30)
Mild (2)	25.8% (26)	32.8% (22)
Moderate (3)	16.1% (10)	16.4% (11)
Severe (4)	1.6% (1)	6.0% (4)

ible cystoscopy. In the video group, six patients declined viewing and these were excluded from analysis. Video viewing had no effect on pain experienced during insertion ($P = 0.79$; range 1–8, both groups). However, there was a significant reduction in pain during bladder examination with video ($P = 0.028$; range 1–8, both groups) (Table 2). There was no significant difference in anxiety scores between the two groups ($P = 0.189$) (Table 3). The number of patients whose descriptions correlated with actual procedure findings was significantly higher in the video group ($P < 0.001$) (Table 4). However, no significant difference was found when patients were asked if they understood what was found ($P = 0.167$).

Table 4
Patient comprehension

	Video (*N* = 62)	No video (*N* = 67)
Patient understanding		
Yes	96.8% (60)	89.6% (60)
No	3.2% (2)	10.4% (7)
Correct description		
Yes	96.8% (60)	71.6% (48)
No	2.9% (2)	28.4% (19)

4. Discussion

The significantly lower pain scores during examination in the video group would suggest that video screens provide an effective distraction. One would expect reduction in pain to be mirrored by less anxiety. This was not shown by our data. The anxiety scores were generally low in both groups (median scores: video = 1, no video = 2) Good pre-procedural staff–patient communication and use of information leaflets may account for this.

Our data indicates, when video is not available, that patients tend to falsely believe they understand the examination findings. Video markedly improved patient understanding of actual findings.

Video camera equipment is approximately £15,000 to purchase. This is a small price if one considers the considerable relief on in-patient services that the introduction of flexible cystoscopy has allowed.

In certain instances the use of video is not appropriate. Some patients do not wish to know what is going on. In this study, 8.8% of patients, who were offered visualisation, declined.

Using a camera may slightly lengthen the time taken to perform cystoscopy. The clinician explaining the findings to the patient during rather than after the procedure may offset this.

Studies to date on ways to improve patient satisfaction of flexible cystoscopy have primarily focused on determining the optimum use of topical anaesthetic gel [2]. This study suggests that video viewing is a useful tool in improving clinician–patient communication and reduces pain experienced during bladder examination. We recommend that it be used as part of standard cystoscopy practice.

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Editorial

IAAS Congress

The 6th International Congress on Ambulatory Surgery will be held in Seville, Spain on 24th–27th April, 2005. The scientific programme has been designed to be of interest to all sections of the multi-disciplinary team that is essential for successful day surgery. Thus, there are sessions on quality improvement, facilities, office based surgery, fast-track surgery, ambulatory anaesthesia, developing the role of nurses, nursing care plans, the scope of minimally invasive techniques, improving patient care, cutting edge developments and educational issues.

The results of the latest International Association for Ambulatory Surgery (IAAS) survey on ambulatory surgery activity in a cross-section of countries will be presented. It will be interesting to see the changes that have occurred since the previous survey. In conjunction with this, there will be papers reflecting international experience on the barriers to ambulatory surgery growth together with others on approaches that have been successful in growing ambulatory surgery.

A number of workshops, satellite symposiums and meetings with experts are also being arranged. So the conference organisers have set out a programme that will be of interest not only to those established in ambulatory surgery, but also those starting out. But equally important are the contributions of delegates to the free paper, poster and video sessions, which make up a significant proportion of the meeting. The more submissions to these sessions the better they will be. So take this opportunity to communicate the results of your research and your techniques in ambulatory surgery to an international audience.

The full social programme accompanying the scientific meeting will allow an informal sharing of ambulatory surgery problems and solutions between delegates from around the world.

Over the ten years since the 1st International Congress on Ambulatory Surgery in Brussels many links and friendships between individuals and day units in different countries have been forged.

So, anyone with an interest in ambulatory surgery should participate in the Seville congress. Put the dates in your diary and submit your papers and register using the contact details shown below.

6th International Congress on Ambulatory Surgery, Seville, Spain 24th–27th April, 2005

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Ambulatory Surgery Calendar

Date	Title	Contact Adress	Venue
2005			
11–15 March	78th Clinical and Scientific Congress of the International Anesthesia Research Society	International Anesthesia Research Society 2 Summit Park Drive, Suite 140, Cleveland, OH 44131-2571. Tel.: +216 6421124; Fax: +216 6421127; E-mail: iarshq@iars.org; Internet: www.iars.org	Hilton Hawaiian Village Honolulu, Hawaii
24–27 April	6th International Congress on Ambulatory Surgery	Tovora Viajes y Congresos, C/Zaragoza, 1.-C.P. 41001, Spain. Tel.: +34 95 4226160; Fax: +34 95 4228070; E-mail: viajestavora@arrakis.es	Seville, Spain
3–5 May	III National Congress on Ambulatory Surgery	Susana Vila Oliveira Hospital do Barlavento Algarvio, Sítio do Poço Seco, 8500338 PORTIMÃO. Tel.: +351 282 450334; Fax: +351 282 450394; E-mail: soliveira@hbalgarvio.min-saude.pt	Alvor-Algarve, Portugal
12–15 May	Society for Ambulatory Anesthesia 20th Annual Meeting	SAMBA, 520 N. Northwest Highway, Park Ridge, IL 60068-2573, USA. Tel.: +1 847/825 5586; Fax: +847/825 5658; E-mail: samba@asahq.org	Marriott's Camelback Inn Resort & Spa, Scottsdale, Arizona
21 October	Society for Ambulatory Anesthesia Mid Year Meeting'05	SAMBA, 520 N. Northwest Highway, Park Ridge, IL 60068-2573, USA. Tel.: +1 847/825 5586; Fax: +1 847/825 5658; E-mail: samba@asahq.org	New Orleans, Louisiana

Items for inclusion in the Calendar section are welcomed. They should be addressed to *Ambulatory Surgery*, Elsevier Irl. Ltd., Elsevier House, Brookvale Plaza, East Park, Shannon, Co. Clare, Ireland, and should include the full title of the conference, dates, venue, contact name, and details of the programme if available.

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Ambulatory Surgery

Aims and Scope

Ambulatory Surgery provides a multidisciplinary international forum for all health care professionals involved in day care surgery. The editors welcome reviews, original articles, case reports, short communications and letters relating to the practice and management of ambulatory surgery. Topics covered include basic and clinical research – surgery, anaesthesia, nursing; administrative issues – facility development, management, policy issues, reimbursement; perioperative care – patient and procedure selection, discharge criteria, home care. The journal also publishes book reviews and a calendar of forthcoming events.

Submission of Articles

Manuscripts prepared in accordance with the instructions to authors should be sent to either of the Editors-in-Chief.