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Editorial

Evidence-based decision making

"Ritual without reverence is a mockery." These words were first drummed into my head during my senior year in medical school, and now, a half-century later, they still ring loud and clear in my professional and personal decision making. In medicine, we so often perform ritualistically, basing our decisions upon the actions of our professors, role models, colleagues, or personal opinion.

The American Society of Anesthesiologists (ASA), in the early 1990s, set out to develop a series of practice parameters (now referred to as practice guidelines). Practice guidelines are systematically developed recommendations that are supported by analysis of the current literature and by a synthesis of expert opinion, open forum commentary, and clinical feasibility data. They are evidence-based and are meant to assist the practitioner and patient in making decisions about health care; they may be adopted, modified, or rejected according to clinical needs and constraints.

In 1996, the ASA appointed a task force to recommend a practice guideline for fasting prior to elective surgery, questioning whether the traditional preoperative clinical practice (particularly in the United States) of requiring patients to have nothing by mouth (NPO) was supported by the current literature. A national practice pattern survey had revealed that 60% of anesthesiologists adhered to the ritual of NPO after midnight, particularly for the adult patient [1]. This had not always been the agreed upon method of care. Throughout the world, the majority of anesthesiologists and surgeons for many decades followed the essence of the advice, given in 1883, by Baron Joseph Lister, who wrote in Holmes' *System of Surgery*, "While it is desirable that there should be no solid matter in the stomach when chloroform is administered, it will be found very salutary to give a cup of tea or beef-tea 2 h previously" [2].

In 1946, following publication of a paper by Mendelson that revealed an alarmingly high incidence of pulmonary aspiration in obstetrical patients receiving general anesthesia, the current practice of NPO after midnight became the established preoperative fasting regimen [3]. As ambulatory surgical procedures increased throughout the 1980s, recommendations surfaced for liberalization of preoperative fasting guidelines [4]. Clear liquids 2–3 h prior to an elective procedure did not appear to increase residual gastric volume or risk of pulmonary aspiration [5,6].

Perioperative pulmonary aspiration that results in morbidity or morality is a rare event. In a prospective study of 215 488 consecutive general anesthetics administered to patients ASA physical status classification I–V (undergoing a wide variety of surgical procedures including those of a significant and invasive nature) at the Mayo Clinic (Rochester, MN) during the years 1985–91, the incidence of death after aspiration was 1:72 000, with none occurring in physical status I–II patients [7]. By applying the numbers to individual ambulatory surgery practice settings, assumptions can be reached on the anticipated frequency of this event. Do these statistics imply that pulmonary aspiration is not very important? Not at all; serious morbidity and significant costs are associated with pulmonary aspiration that does not result in death. However, there are no data that suggest that the use of medication or NPO after midnight decrease the risk of pulmonary aspiration.

The ASA guideline, adopted in 1998, addressed established rituals, using evidence-based methodology to provide detailed recommendations for preoperative fasting as well as the use of pharmacologic medications to modify volume and acidity of gastric content [8]. The guideline recommends that, for procedures requiring general anesthesia, regional anesthesia, or sedation/analgesia, it is appropriate to fast from intake of clear liquids for two or more hours; from intake of breast milk for four or more hours; from intake of infant formula for six or more hours; from intake of a light meal or non-human milk for six or more hours. The guideline notes that intake of fried or fatty foods or

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meat may prolong gastric emptying time (both the amount and type of foods ingested must be considered). Additionally, the guideline does not recommend the routine preoperative use of gastrointestinal stimulants, medications that block gastric acid secretions, antacids, antiemetics, anticholinergics or multiple agents for patients who are at no apparent increased risk for pulmonary aspiration.

In summary:

- Pulmonary aspiration is rare in healthy adults and children;
- Patients with risk factors should have protected airways;
- Routine preoperative prophylaxis is not cost-effective;
- Adults and children should receive clear liquids up to 2 h prior to anesthesia;
- A guideline is not intended as a standard or an absolute requirement;
- The purpose of a guideline is to enhance the quality and efficiency of care, stimulate evaluation of individual practices, and reduce complications.

In the ambulatory surgery setting, we are seeing an increasing number of patients with health problems; we are seeing more invasive and longer surgical procedures. Patient safety is dependent upon evidence-based decision making.

References

[1] Green CR, Pandit SK, Schork MA. Preoperative fasting time: Is the traditional policy changing? A national survey. Anesth Analg 1996;83:123–8.
[2] Strunin L. How long should patients fast before surgery? Time for new guidelines. Br J Anaesth 1993;70:1–3.
[3] Mendelson CL. The aspiration of stomach contents into the lungs during anesthesia. Am J Obstet Gynecol 1946;52:191–205.
[4] Maltby JR, Sutherland AD, Sale JP, Shaffer EA. Preoperative oral fluids: Is a five hour fasting justified? Anesth Analg 1986;65:1112–6.
[5] Schreiner MS, Triebwasser A, Keon TP. Ingestion of liquids compared with preoperative fasting in pediatric outpatients. Anesthesiology 1990;72:593–7.
[6] Maltby JR, Lewis P, Martin A, Sutherland LR. Gastric fluid volume and pH in elective patients following unrestricted oral fluid until 3 hours before surgery. Can J Anaesth 1991;38:425–9.
[7] Warner MA, Warner ME, Weber JG. Clinical significance of pulmonary aspiration during the perioperative period. Anesthesiology 1993;78:56–62.
[8] A Report by the American Society of Anesthesiologists Task Force on Preoperative Fasting. Practice guidelines for preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration: Application to healthy patients undergoing elective procedures, Anesthesiology 1999;90:896–905.

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Conference report

Portuguese Association for Ambulatory Surgery 2000

Enthusiastically supported by the International Association for Ambulatory Surgery (IAAS), the Portuguese Association of Ambulatory Surgery (APCA) was constituted in September 1998. Its basic aim was to develop high quality ambulatory surgery programmes in both public and private Portuguese hospitals. In June 2000 APCA had 170 members representing different health groups, surgeons, anaesthetists, nurses, managers and economists. Two corporate members also joined APCA.

There was a tremendous lack of information about day surgery amongst all the partners involved in the Portuguese Health Care System. Different definitions, different concepts and doubts about the organisational aspects needed for the development of high quality ambulatory surgery programmes, makes all the data available from Portugese hospitals unreliable for comparisons with data from other countries. The Portuguese Health Institute of Finance and Management ('Instituto de Gestão Informática e Financeira da Saúde', IGIF) showed us a 10.4% of day surgery rate for the 18 basket procedures selected by C. De Lathouwer and J.P. Poullier in the 1994–1995 International IAAS Survey [1]. Still, there are very few day surgery units in Portuguese Hospitals.

With a population of 9.5 million, Portugal spends much more on healthcare than the European Community's national average (8.2% in relative terms to its Gross National Product, in 1998). Its shortage of financial resources added to a shortage of health professionals (specially nurses and doctors in some specialities such as anaesthesiology) and an increasing surgical waiting list (nearly 100 000 patients in 1999) makes Portugal a European country that should seriously implement high quality programmes in the field of ambulatory surgery.

Bearing this in mind and being aware of the advantages of day surgery that we all recognise, APCA undertook the enormous task to raise awareness of and interest in, the importance of ambulatory surgery among all healthcare partners.

During 1999, APCA participated in the International Terminology for Ambulatory Surgery promoted by the IAAS members Lindsay Roberts and John Warden and proposed the Portuguese translation and adaptation to our health system. Relying on this document APCA started to involve the Health Ministry and its Public Institutions (General Health Direction, Health Institute of Finance and Management, Quality Health Institute, Design and Health Equipment Institute) in team meetings to discuss, advise, legislate and regulate the development of high quality ambulatory surgery programmes in Portugal.

A Portuguese database on ambulatory surgery is now beginning to function. APCA challenged the 73 most important Portuguese hospitals to nominate one interlocutor each to APCA who should be the person responsible to inform and to answer APCA surveys. We hope to have reliable data on ambulatory surgery in 2002.

Owing to the large number of national journals in the health field in a small country with few writers, APCA initially felt that the best way to inform the health professionals would be by publishing some issues on day surgery in these journals. In conjunction with the Portuguese Society of Anaesthesiology (SPA), APCA published a thematic issue on Ambulatory surgery which was distributed to all Portuguese anaesthetists and APCA members. Unfortunately this interesting way to promote the concept of day surgery was not successful with other journals. Consequently, APCA decided to publish the Portuguese Journal of Ambulatory Surgery ('Revista Portuguesa de Cirurgia Ambulatória'). The first issue will be printed at the end of 2000. The Portuguese Journal will be written in Portuguese or English (according to the paper) with the summary in both languages. One issue will be published each year. The Editor-in-Chief, can be contacted at the address below:

Dr Domingos Marques, Editor-Chefe da Revista Portuguesa de Cirurgia Ambulatória, Serviço de Anestesiologia, Hospital Geral de Santo António, 4099-001 PORTO, PORTUGAL, Fax — 351-22-2088115, e-mail: dmarques@anesthgsa.min-saude.pt.

The major enterprise undertaken by APCA since its foundation was the organisation of the First National Congress on Ambulatory Surgery which took place in the North of Portugal, at Póvoa de Varzim, between

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29th and 31st May 2000. The Portuguese Health Secretary was amongst more than 500 delegates.

The objectives of the Portuguese Congress were:

1. To raise the awareness of ambulatory surgery among public and private health authorities leading to the formulation of adequate national guidelines and policies.
2. To review the development of ambulatory surgery in a European context.
3. To establish fundamental protocols and guidelines in order to ensure the safe practice of ambulatory surgery.
4. To structure and co-ordinate national research, education and quality assurance.
5. To provide a multidisciplinary forum for the development of day surgery in Portugal.

The Congress participants took advantage of international expertise and know how from a group of European leaders in the field of ambulatory surgery. Hopefully this will raise enthusiasm for day surgery in Portugal.

After 3 days of sharing experiences, discussing procedures proposing guidelines, there was no doubt that Portugal should develop ambulatory surgery in order to profit from its economic, clinical and social advantages. Developing an ambulatory surgery system will rationalise healthcare costs whilst maintaining the quality of care.

The Second National Congress on Ambulatory Surgery organised by APCA will be held in Lisbon between 6th and 8th May, 2002.

References

[1] De Lathouwer C, Poullier JP. Ambulatory surgery in 1994–1995: the state of the art in 29 OECD Countries. Ambul Surg 1998;6:43–55.

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Conference report

Report from The British Association of Day Surgery 2000; benchmarking day surgery

We recently held our Annual Scientific Meeting in Cardiff, which attracted a wide range of papers and posters from our members, news of further advances in nursing practice and developments in day surgery in primary care. The main focus was on performance in day surgery where our membership confirmed their support for three avenues of work that we think are distinctive and complimentary. There have been major developments in all three, which are outlined in the following paragraphs.

Firstly the Chief Executive of a hospital trust now has responsibility for Clinical Governance in which an overview is required of the clinical work of all the departments. This is based mainly on national statistics, and we have worked with CHKS in developing a reporting sheet of activity that makes comparison between trusts for individual surgical procedures with the surgeons identified by a code number. The sheet also includes the percentile ranges and waiting times for treatment, and includes the reported numbers of complications, adverse reactions and misadventures though this data is very variable. We have paid particular attention to the selection of the procedures with our secretary Joe Cahill expanding the original basket of 20 procedures chosen by the Audit Commission into a trolley of nearer 40. This expansion means you can not only follow the bulk of the work but also look at the growing edge such as laparoscopic operations. There are also areas in which day surgery is reducing with for instance the transfer of cystoscopy to outpatients and in the year ahead a reduction in the number of 8 s extracted following the guidance from the National Institute for Clinical Excellence.

We see the Chief Executives responsibility to be the determination of the overall pattern of the clinical programme so that the policy of the trust, investment in facilities, funding of devices equipment and drugs, budget for staff employment, education and training, and priorities in the research programme move hand in hand.

To go back in time to Rudyard Kipling's 'serving men' this covers largely the What question, with comparison in terms of Where for inpatients and day cases, When in terms of waiting times and a little about the Who in terms of the surgeon concerned.

The feeling of unity that the title day surgery implies has been dispelled in our work with Roger Dyson and the Clinical Benchmarking Company. Members of Council formed an Expert Panel for the development of a questionnaire covering the activity, the facilities, the staff, the expenditure, the equipment and the management arrangements of day surgery units, which were either self contained or had their own dedicated wards or theatres. The word unity has to be replaced by the word diversity to describe our findings from the 37 hospitals that have taken part.

Day surgery may be performed in several sites in the hospital and in collaboration with units in other hospitals. Procedures are performed not only in the theatres but also in converted anaesthetic rooms. endoscopy and laser treatment rooms. The sessional count is therefore different between hospitals with similar space The combination of surgery and medicine, pain relief, radiology and other practices varies greatly placing different requirements on the nurses and operating department practitioners in terms of numbers needed for a session and their training. This does not come out in a simple procedural count and vitiates the calculation of staff productivity ratios. Preoperative assessment by nurses is widespread and there is the beginnings of nursing surgery for the excision of skin lesions and some eyelid surgery. Who does the majority of the surgery varies with some staff grade surgeons seeing their own patients and others drawing patients for surgery from consultant lists by local negotiation. Both the work of the staff grade surgeons and the nurses affects the apparent productivity of the surgeons, while the activity of the anaesthetists is confounded by the increasing number of sessions performed under local anaesthetic. In the staffing returns we found managers and nurse specialists left out of the count and such variation in the arrangements for ancillary help that it could not be summarised.

Only the self-contained day surgery units that had their own cost centre and computerised management system knew what the practice was costing. Others might not know the cost of drugs, maintenance, equip-

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ment or devices, would not have discussed overhead charges and would not be able to proportion the cost of shared staff. Day surgery directors with no responsibility for a budget were unlikely to have authority over the use made of particular sessions or to have the staff from the various professions reporting to them. Surgeons, anaesthetists and other clinicians may not attend audit and management meetings on day surgery. Rather cruelly some would say that in many hospitals day surgery is more like a happening rather than a planned event which affects the nature, methods and rates at which practice can be modified.

The questionnaire has given us full and better particulars as the lawyers would say. To return to Rudyard Kipling this has given insight into the How, added the other staff to the consultants in the Who, and the non-surgical work to the what. The ideas about Where have also expanded and it has highlighted the need to ask again and again 'why not' in response to the evidence of slow uptake.

Based on his experience with the pathologists and radiologists, Roger Dyson tells us it will take at least two more annual cycles of modified questionnaires and improved analyses to derive a minimum data set in which the participating hospitals have confidence as a basis for comparisons to be made. This work is primarily of interest to the Directors of Day Surgery and the Directors of the Clinical Divisions using day surgery facilities.

The third strand in our work involves tying day surgery into more managerial developments in the hospital, and here we have begun work with Peter Griffiths and the Health Quality Service. We are thinking of the programmes in risk management, the handling of complaints, focusing on patent satisfaction and revalidation of clinical competence. We are also concerned that the number of reviews of clinical practice are proliferating with Deans and Royal Colleges as active as the Commission on Health Improvement intends to be. This raises the question whether there is a basic accreditation day surgery units could achieve that would obviate the necessity for starting at square one on every occasion. This will lead us into site visitation where we shall learn much from the experience of HQS over the last ten years-and they will for the first time become involved in the assessment of clinical practice.

What all three programmes have in common is that the hospital is the paymaster and therefore can expect CHKS, CBC and HQS to work in their interest and the interest of their patents. The cost of taking part is reasonable in terms of the turnover and from what we already know considerable progress could be made. As the director of one of the largest and best of the day surgery units said, the questionnaire had surprised him by the number of improvements it has shown to be possible in his own unit.

This is of course a major change in perspective for the Association. We recognised the need for change in our Council and are glad that John Shaw has joined us with his experience in the Department of Health and latterly the Patient Association. We anticipate that David Wood the Chief Executive in Aintree will be elected to Council this year-Aintree has a large virtually free standing day surgery unit on the old Walton Hospital site in Liverpool. And the programme at our ASM has changed to include speakers such as Ian Carruthers on the new NHS, David Bowden on risk management David Colin-Thome on primary care and Chris Ward on surgical ethics. Last week in Kdiff the Association Lecture was given at John Shaw's suggestion by Nancy Kline on the importance of listening and the Keynote Address by Graham Whitehead of British Telecom on the Electronic Revolution. Carrying our membership with us in this evolution is of course essential and we have therefore been pleased to see the number grow by a hundred to 750 in the last year with 325 coming to the ASM.

When I say that these are interesting times, the Chinese would think we are cursed, but we are more optimistic and expect that our taking control of our affairs will be to the good of our patients and make for more fulfilling careers.

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Conference

Germany faces major changes in health system

The unification of Europe brings about many changes. One field that the Germans hitherto did not think about was the German health care system. It is probable that the free market of Europe will force a decision to change our national public system.

In the German health care system 90% of Germans are members of the statutory health insurance system which mainly consists of

1. Statutory health funds (sickness funds),
2. Doctors who belong to the Association of Panel Doctors (Kassenärztliche Verteinigung),
3. Hospitals represented by the German Hospital Association (Deutsche Krankenhausgesellschaft DKG).

Every member of the statutory insurance fund can request health services anywhere. He or she just has to show their membership card. Everything is paid for by benefits of kind (Sachkostenprinzip). This means that 90% of the population never sees a medical bill. For Germans it was and is not understandable that in some countries for instance treatment is limited by upper age.

The German government sets the frame for the statutory health insurance system that is laid down in the 5th Book of Social Security Code (SGB V). The practical work then is done by so-called self-administration institutions. These are, amongst others, the Statutory Insurance Funds (Krankenkassen) and the Association of Panel Doctors (Kassenärztliche Vereinigung). Hospitals did not form a self-administration institution: but our hospitals are either public (57%) or non-profit-making organizations (37%). Only 6% are private hospitals. Thus practically 94% of the hospitals are under public law.

All self-administration institutions are state institutions, They carry an official Seal. They finance themselves through contributions of the Statutory Health Insurance Funds. Yet they stay under the guidance of the State (Federal Ministry for Health). No self-administration institution is allowed to act against the State. This also pertains to the hospitals that are under public law. One could call this a modern form of vassalage.

The bang came two years ago when the Statutory Health Insurance Funds were judged by German civil courts to be enterprises according to the new European anti-trust law. This was the beginning of the end of the German State guided health care system in which State interests had always to be recognized and the whole system was financed by compulsory contributions of the vast majority of the German population.

This system of extended State guidance has given power and financial means to State and local officials and to the self-administration institutions. The fact that the German self-administration institutions are not mentioned in the Treaty of Maastricht, which is the basis of the European Union, leaves only two possible ways for the future; Either the German 'Gesundheissystem' revolves back to a state-run public health service as in Great Britain, or it changes to a free system with direct cost reimbursement and a basic health care provision for all citizens.

As the German self-administration institutions so far have set the prices for most of the established pharmaceutical drugs they are violating European anti-trust laws because an), company, agency or alike which has an influence on the free market is judged to be an enterprise. This situation affords a political decision. All German parties do not want a state-ruled public health system, and the ruling government of social democrats and 'green people' do not want to become the grave-diggers of a social security system that was the pride of many social-minded people in Germany. So the government put this question before the Federal Constitutional Court of Germany (Bundesverfassungsgericht). This move will buy some time for the present government. However, most health officials start to realize that the unification of Europe will bring a major change to the German health system.

Meanwhile the National Hospital Organization (Deutsche Krankenhausgesellschaft) and the Statutory Health Funds (Krankenkassen) have agreed to accept the DRG-System of Australia for German hospitals starting in the year 2003, The German Association of Ambulatory Surgery (Bundesverband für Ambulantes Operieren BAO) investigated with help of the International Association for Ambulatory Surgery (IAAS), especially of Lindsay Roberts of Australia, the Australian DRG system with respect to ambulatory surgery. Classification and funding of ambulatory

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surgery arc well established under the Australian system so that the BAO now votes to adopt the Australian DRG system also for all ambulatory surgery in Germany. This hopefully will improve the remuneration of ambulatory surgery in Germany.

So far 99% of ambulatory surgery in Germany is paid for by the funds of the Association of Panel Doctors because this association traditionally is responsible for all ambulatory services. Their remuneration however covers only 41% of the costs of surgical services. Therefore hospitals did not pick up ambulatory surgery which is almost exclusively performed in free standing, licensed day clinics. These day clinics have to run very strict cost management and can exist only by cross-funding with income from privately insured patients.

What happens to Germany may occur to other countries in Europe as well, We have had a health care system which was influenced mainly by Christian sociology, by the fight of socialists for the rights of workers and by a system of state guidance through self-administration institutions. The unification of Europe, which in my view is just part of the globalization process, does not respect national peculiarities but it focuses on the free market with anti-trust laws and on the independent, informed citizen. The unification of Europe and globalization are secular movements, Both will bring medicine closer towards three goals:

1. Fast medical services
2. Efficient cure
3. Low-total cost per case.

With respect to all three targets ambulatory surgery plays a leading role. Therefore we should not be depressed if national health services adapt to global changes, Ambulatory Surgery is on the winning side.

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The use of topical lidocaine/prilocaine cream prior to childhood circumcision under local anesthesia

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Abstract

A prospective study was conducted to evaluate the efficacy of prior application of topical eutectic mixture of local anesthetics, EMLA, in alleviating the pain associated with infiltration local anesthetic (LA) for circumcision in children and to assess its impact on the outcome. A total of 173 children aged 3–13 years requiring circumcision were randomly assigned to have EMLA or placebo cream applied over the root of the penis 1 h before subcutaneous ring block. A blinded observer rated the pain response on a 10-point visual scale during needle insertion, injection of local anesthetic and circumcision. Children needing conversion to general anesthesia (GA) were counted as failures. A total of 89 and 82 boys were included in the EMLA group and placebo group, respectively. Significantly lower pain scores were recorded for needle puncture in the former group ($P < 0.001$), whilst pain scores for injection and during circumcision were not statistically different between the two groups ($P = 0.037$ and 0.138, respectively). A total of 88 out of the 89 boys pre-treated with EMLA completed the procedure, whereas seven boys in the placebo group necessitated conversion to GA ($P = 0.022$). The converted cases had higher values for all pain scores and tended to be younger. Therefore, EMLA cream is a useful adjunct to LA for childhood circumcision because it effectively reduces the sharp pain induced by needle puncture. However, careful patient selection is required for a low conversion rate to GA.

Keywords: EMLA; Local anesthesia; Childhood circumcision

1. Introduction

Eutectic mixture of local anesthetics (EMLA) is a eutectic mixture of local anesthetics, lidocaine and prilocaine, suspended in an oil-in-water emulsion (Astra, Sweden). The high concentration of the local anesthetics (LA) stimulates the transdermal spread of the active ingredients, providing effective surface analgesia on intact skin [1]. Over the past few years, a large body of clinical data has been amassed demonstrating clear superiority of EMLA over placebo in reducing acute pain inflicted by a wide variety of medical/surgical procedures on superficial skin surface [2]. An important area of pediatric practice in which EMLA cream could find wide application is treatment for phimosis. Convincing evidence of its efficacy in this common surgical condition remains meager in the English literature. Effective analgesia has been shown by the cream to permit separation of the preputial adhesions in lieu of circumcision in children [3,4]. EMLA cream has been tried as the sole anesthetic for circumcision in neonates and in old children [5–7]. Even though the procedure was feasible and pain attenuated, significant distress was still evident and the analgesic effect was inferior to either subcutaneous ring block or dorsal penile nerve block [8]. Amid all these uncertainties about its role in circumcision, we set out to determine whether prior application of EMLA significantly reduces the discomfort of infiltrative anesthesia and improves the outcome by a randomised, double-blind, placebo-controlled study.

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2. Patients and methods

Children aged 3–13, about to undergo circumcision and assessed to be cooperative enough were offered the choice of general anesthesia (GA) or LA. With informed consent, suitable children of parents who opted for the latter anesthesia were allocated, by drawing lots, to receive either EMLA or a placebo cream. The two creams were indistinguishable. One hour before the anticipated time of circumcision, a thick layer (2 g) of the cream was applied around the root of the penis and a patch of self-adhesive Tegaderm® was placed over the cream to keep it in place. The behavior of the child in the waiting room was subjectively assessed by a single observer; it was described as playful, calm, anxious or crying. Just prior to circumcision, the dressing and cream were removed and the skin was cleansed with aqueous hibitane. Circumcision was performed using a subcutaneous ring block in the usual manner. An independent nurse was assigned specifically to score separately the pain of needle puncture, the pain of local anesthetic injection and the pain during circumcision on a 10-point visual scale with 0 = no pain and 10 = excruciating pain, combined with a pictorial scale based on facial expressions [9,10]. Side effects and complications detected at operation or during follow-up were registered.

3. Results

A total of 173 boys with a mean age of 8.8 years (range 3–13 years) were enrolled in the study. They were randomised to one of two groups: (1) pre-treatment with EMLA ($n = 91$); (2) placebo cream ($n = 82$). Two children were subsequently withdrawn from the EMLA group: circumcision could not be performed because they became very agitated and uncooperative once they saw the injection needle in the operating theatre. The results were analysed statistically by Student's t-test for paired data or by Chi-squared test of independence as appropriate (Table 1). There were no statistical differences between the two groups in patient's age ($P = 0.849$) (t-test), weight ($P = 0.774$) (t-test), pre-treatment emotional status ($P = 0.337$) (Mann-Whitney U test), operative time ($P = 0.138$) (Student t-test), operating surgeon's experience ($P = 0.804$) (Chi-square test) and the incidence of post-operative edema and hematoma formation.

The mean pain score for needle puncture was significantly lower in the EMLA-treated group compared to the placebo group (2.69 ± 1.72 versus 3.82 ± 1.92; $P < 0.001$). However, statistical differences were not observed in pain scores for infiltration (3.46 ± 2.29 versus 4.22 ± 2.51; $P = 0.037$) and pain scores during circumcision (2.37 ± 2.07 versus 2.94 ± 2.75; $P = 0.138$) (Fig. 1).

LA had to be converted to GA in one boy despite pre-treatment with EMLA, whereas seven boys from the placebo group needed conversion because of pain associated with attempted LA. Thus EMLA appeared to be a useful adjunct to local anesthesia in terms of improved patient compliance (EMLA group 88/89 versus placebo group 75/82; $P = 0.022$) (Mann Whitney U test).

A total of eight children (one from EMLA group and seven from the placebo group) failed to complete the procedure under LA. No statistical differences were found between this failure group and the 163 successful cases in body weight (25.7 ± 4.5Kg versus 31.2 ± 10 kg; $P = 0.154$), experience of the surgeon ($P = 0.614$, Mann-Whitney U test) and the pre-procedural behavior ($P = 0.084$, Mann-Whitney U test). On the other hand, successful outcome was positively correlated with less pain scores for needle insertion (2.8 ± 1.6 versus $7.7 \pm$

Table 1
Comparison of patient variables between the EMLA-treated group and placebo group[a]

Characteristics	EMLA group ($n = 89$)	Placebo group ($n = 82$)	P value
Age (month)	106.39 ± 23.67	105.70 ± 24.18	$P = 0.849$ (t-test)[b]
Both weight (kg)	30.63 ± 10.09	30.20 ± 9.57	$P = 0.774$ (t-test)[b]
Operating time (min)	23.56 ± 7.87	25.62 ± 8.06	$P = 0.138$ (t-test)[b]
Pre-procedural behaviour			
Playful	35	21	
Calm	39	52	$P = 0.337$ (Mann-Whitney U test)[b]
Anxious	12	8	
Crying	3	1	
Surgeon's experience			
>4 year	36	31	
>2, <4 year	19	21	$P = 0.804$ (χ^2 test)[b]
<2 year	34	30	

[a] Plus–minus values are means ± SD.
[b] Not significant.

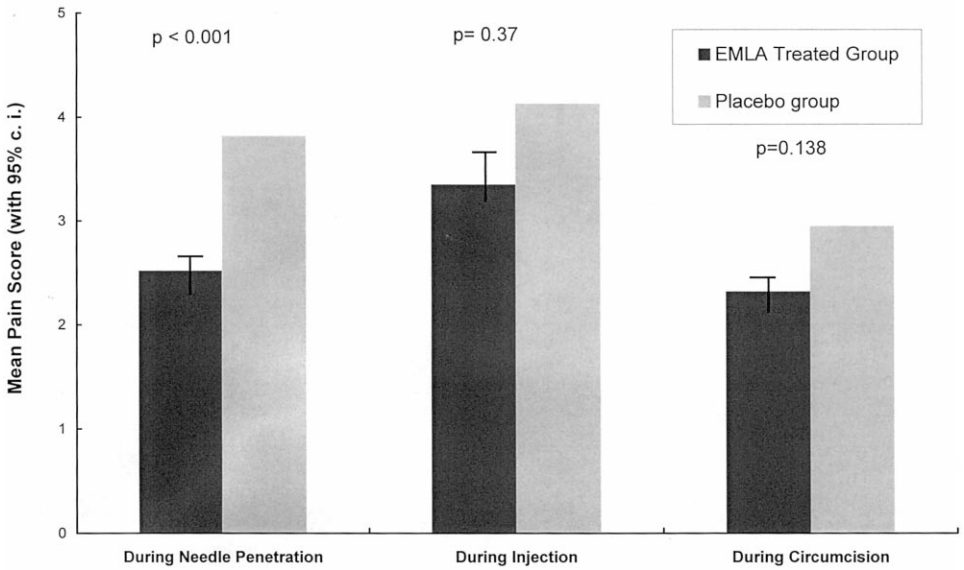

Fig. 1. Comparison of mean pain scores between the EMLA-treated group and placebo group.

1.6; $P < 0.001$), infiltration of local anesthesia (3.4 ± 2.3 versus 8.3 ± 1.5; $P < 0.001$) and during surgery (8.5 ± 1.7 versus 2.4 ± 2.4; $P < 0.001$), as well as older age (7.8 ± 2.0 years versus 10.9 ± 2.1 years; $P = 0.044$).

No untoward effects from the EMLA, either locally, such as redness and irritation, or generally, such as allergic reaction were reported by either the staff or the parents.

4. Discussion

The recent vogue for day surgery has rekindled interest in loco-regional anesthesia, which is preferred in the day care setting. Childhood circumcision constitutes a significant bulk of work in most day surgery centers. Even though penile nerve block and subcutaneous ring block are highly effective means of controlling pain from circumcision procedure, there remains the discomfort of administering the anesthetic by injection. The latter is a combination of sharp pain caused by needle insertion and duller pain associated with injection of the volume of local anesthetic. The first hurdle for successful circumcision under LA is needle puncture. The present study confirms the previous studies that the EMLA preparation is clinically effective in reducing pain caused by needle puncture at the start of local anesthesia [11–13]. Our results further proved that this salutary effect could be translated into improved outcome in terms of significantly greater proportion of children completing the operation without conversion to general anesthesia.

Controversy still exists as to whether EMLA could effectively ameliorate injection pain. There are controlled studies showing that pain induced by subcutaneous and intramuscular injections was reduced by topical EMLA application [13,14], while other studies found EMLA not clinically effective in alleviating pain produced by infiltration of local anesthetics [15,16]. The general feeling has been that EMLA may not penetrate to a sufficient depth to counteract the pain of fluid injection deeper than the skin — this is again borne out by the present study. Nonetheless, the patient compliance appeared better in the EMLA-treated group due to a marked reduction in needle insertion pain.

When the 'failure cases' were analysed categorically, it was found that high insertion pain score and high injection pain score were significant factors predicting failure. In addition, patients completing the procedure without conversion to GA were significantly older than the converted cases ($P = 0.039$) — this contrasts with the finding in a previous study that age of child was not a determinant of success and failure of EMLA [17]. Body weight and surgeon's year of experience were not predictive factors, surprisingly, neither was the observed behavior in the waiting room. In our experience, it is very hard to predict which child would cooperate in the out-patient clinic, or even in the waiting room before actually exposing the child to the operating room and, in particular, the injection needle. Two children originally allocated to the EMLA group became so agitated when they were laid on the operating table and saw the anesthetic-laden syringe that the needle did not have a chance to prick on the skin. If these two cases were included in the EMLA group for statistical analysis of the outcome, the difference in conversion rate between the two groups would not have been statistically significant (three failures out of 91 versus seven failures out of 82, $P = 0.14$). Anecdotal notes in published studies suggest that children with an

intense needle anxiety may not be helped by the application of ELMA [17,18]. Therefore, to improve the 'success rate' with local anesthesia, it would be advisable to test for the psychological response of the child to injection needles in the strange environment of the operating theatre. A further study is under way to determine whether presence of parents in the operating room could allay the anxiety of the child and improve the outcome.

In conclusion, topical application of EMLA cream saves the child from a painful puncture into a sensitive area and is a useful adjunct to local infiltration analgesia for circumcision in a carefully selected group of children.

References

[1] Steward DJ. Eutectic mixture of local anesthetics (ELMA): What is it? What does it do? J Ped 1993;122:S21–3.
[2] Buckley MM, Benfield P. Eutectic lidocaine/prilocaine cream. A review of the topical anesthetic/analgesic efficacy of a eutectic mixture of local anaesthetics. Drugs 1993;46:126–51.
[3] MacKinlay GA. Save the prepuce painless separation of the preputial adhesions in out-patient clinic. Br Med J 1998;297:590–1.
[4] Lim A, Saw Y, Wake PN, Croton RS. Use of a eutectic mixture of local anesthetics in the release of preputial adhesions. Is it a worthwhile alternative? Br J Urol 1994;73:428–30.
[5] Benini F, Johnston C, Faucher D, Aranda J. Topic anaesthesia during circumcision in new-born infants. JAMA 1993;270:850–3.
[6] Taddio A, Stevens B, Craig K. Efficacy and safety of lidocaine–prilocaine cream for pain during circumcision. N Engl J Med 1997;336:1197–201.
[7] Tritrakarn T, Raksaniani A, Thaosuwan S, Khaowichit S, Thaiprathan A. EMLA cream produces adequate anesthesia to perform circumcision in children. Reg Anesth (Suppl 3) 1992;17:15.
[8] Lander J, Brady FB, Metcalfe JB, Nazarali S, Muttitt S. Comparison of ring block, dorsal penile nerve block, and topical anaesthesia for neonatal circumcision: a randomised controlled trial. JAMA 1997;278:2157–62.
[9] Maunskela EL, Kopela R. Double-blinded evaluation of lidocaine–prilocaine cream (EMLA) in children. Br J Anesth 1986;58:1242–5.
[10] Daiva B. The Faces pain scale for the self-assessment of the severity of pain experienced by children: development, initial validation and preliminary investigation for ratio scale properties. Pain 1990;41:139–50.
[11] Elson JA, Paech MJ. ELMA cream prior to insertion of elective epidurals. Anesth-Intensive-Care 1995;23:339–41.
[12] Ralston SJ, Head-Rapson AG. Use of ELMA cream for skin anaesthesia prior to epidural insertion in labour. Anesthesia 1993;48:65–7.
[13] Raveh T, Weinberg A, Sibirsky O, et al. Efficacy of the topic anesthetic cream, EMLA, in alleviating both needle insertion and injection pains. Ann Plastic Surg 1995;35:576–8.
[14] Himelstein BP, Cnaan A, Blackall CS et al. Topical application of lidocaine–prilocaine (ELMA) cream reduces the pain of intramuscular infiltration of saline solution, J Ped 129, 718–721.
[15] Tucker N, Degnan N, Codere F, Sloan J. Effect of a topic anaesthetic cream (ELMA) in reducing pain caused by infiltration of local anaesthetic in eyelid surgery. Can J Ophthalmol 1993;26:167–70.
[16] Hansen BW, Sorensen PV. The ELMA cream versus placebo in MMR vaccination of older children in general practice. Ugeskr-Layer 1993;155:2263–5.
[17] Lander J, Hodgins M, Nazarali S, McTavish J, Quellette J, Friesen E. Determinants of success and failure of EMLA. Pain 1996;64:89–97.
[18] Ehrenstrom-Reiz G, Reiz S. EMLA: a eutetic mixture of local anesthetics for local topical anaesthesia. Acta Anesth Scand 1982;26:596–8.

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Post-operative nausea and vomiting in patients undergoing day-case surgery: an international, observational study

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Abstract

Post-operative nausea and vomiting (PONV) are complications of surgical procedures, and are of particular relevance in the day-case setting. The aim of this study was to examine the incidence and impact of PONV before and after discharge from day surgery units. Patients recorded the incidence, severity and impact of PONV for 5 days following surgery. The incidence of PONV in the 561 eligible patients was 17% upon waking, 14% travelling home and 3% by the 5th day post-surgery. PONV was most common in gastrointestinal, obstetric and gynaecological surgery. Although freedom from pain and PONV are requirements for discharge after ambulatory surgery, PONV is still a problem post-discharge.

Keywords: Post-operative nausea and vomiting; PONV; Day-case surgery; Observational study

1. Introduction

An increasing amount of surgery is being performed on a day-case basis. It not only requires the highest standards of care but also a clear demonstration of the patient's overall readiness for discharge. Furthermore, the types of surgery being performed on a day-case basis are of far greater complexity than might have been thought possible ten years ago. One of the major limiting factors that prevents the early discharge of patients from a day surgery centre is post-operative nausea and vomiting (PONV). Adequate control of PONV, a well-recognised problem in the immediate post-operative phase, has become one of the pre-requisites for patient discharge from day-case surgery. Although several studies have assessed the incidence of PONV in the hospital setting [1–3] comparatively little research has been done to establish the incidence of PONV after the patients' discharge from hospital. In a US pilot study, PONV was reported to occur in 35% of patients over a 5-day period of assessment following discharge from out-patient surgery centres [4]. In a similar study of patients undergoing day-case surgery, more patients experienced PONV after discharge than prior to discharge [5]. Results from a study of post-operative complications in children who had undergone day-case surgery showed that 13% of these patients had PONV at home [6].

PONV occurs in a sizeable proportion of the patients in the immediate post-operative phase but this is not generally a problem while patients remain supervised in the day-case unit and receive anti-emetic medication if required. However, PONV following discharge home may be distressing both for the patient and carers. Post-discharge PONV can have economic consequences for hospitals due to possible hospital re-admission [7] and for general practitioners, who may be contacted by patients seeking treatment for post-operative complications. Humanistic consequences include patient and

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family distress, as well as anxiety if further surgery is ever required. In one study of patients who underwent ambulatory surgery, 71% of patients who reported dissatisfaction with the procedure attributed this to PONV [8]. Patients and their carers may also suffer due to time lost from work and normal activities, while patients may experience delayed recovery and persistence of post-operative complications [9].

The purpose of this study was to examine patients' experiences with PONV both during and after discharge home from day-case surgery centres. The objectives of the study were to determine the incidence of post-discharge PONV, the extent to which the PONV affected normal functioning and daily activities and the use of anti-emetic agents as prophylaxis or treatment for PONV.

2. Methods

2.1. Study design

This international, prospective, observational study was carried out in adults undergoing day-case surgery. Patients provided details of the extent and severity of PONV and pain using a daily diary card, which was completed during the hospital stay and for 4 days following discharge.

Patient details including age, gender and previous history of PONV were recorded by the investigator on a case report form (CRF). Details of the operation, anaesthetic regimen and the overall use of anti-emetic and analgesic agents were also recorded on the CRF. Details of any anti-emetic or analgesic medications prescribed and supplied prior to discharge home were also entered onto the CRF. Delays in discharge due to PONV and whether the patient was readmitted to hospital were also recorded.

Patient diary cards contained information on the severity of nausea (defined as: none, mild, moderate or severe), the distress caused by nausea (defined as not at all, slightly, quite a bit or extreme) and the number of emetic episodes. Patients also recorded pain severity (defined as: none, mild, moderate or severe) and resulting distress (defined as not at all, slightly, quite a bit or extreme) prior to surgery and at pre-determined times post-operatively until arrival home on the day of surgery. Thereafter, the patients completed the diary card before going to bed on the day of the operation and for a further 4 days to record the incidence and grade of nausea, vomiting, pain, utilisation of medication and the impact of their symptoms on time lost from work and normal activities.

The impact of PONV on daily activities was assessed using the following questions: Did nausea or vomiting prevent you from doing your work/normal activities today? How much time did you miss from work/normal activities because of nausea or vomiting?

Healthcare resource utilisation due to PONV was assessed using the following questions: Did a doctor or nurse visit you at home today because of nausea or vomiting? Did you visit your doctor or the clinic today because of nausea or vomiting? Were you admitted to hospital because of your nausea or vomiting? Hospital admission, if yes, how many days?

2.2. Patients

Patients were over 18 years of age, and underwent surgery that did not require hospitalisation or a stay of more than 24 h in the day-case unit. Patients who were illiterate, mentally impaired or unable to follow instructions were excluded. Prophylactic anti-emetic therapy with ondansetron was not permitted. All patients were required to provide written, informed consent and the study was conducted according to the Declaration of Helsinki. Local ethics committee approval was obtained where necessary. The date and time of discharge was recorded by the investigator following delayed discharge or hospitalisation.

2.3. Data analysis

Pre- and post-operative data were reported in the form of frequency distributions. No statistical tests were performed.

3. Results

3.1. Patients

A total of 586 patients were recruited in nine countries: the Czech Republic (17 patients), Egypt (115 patients), Estonia (36 patients), Germany (164 patients), Iceland (76 patients), Italy (11 patients), Norway (23 patients), New Zealand (32 patients) and the UK (112 patients). Of the 586 patients recruited into the study, three were not eligible for inclusion: one was under 18, one was hospitalised for more than 24 h and another was judged unable to complete the diary card. A further 22 patients failed to return their diary cards. Although prophylactic ondansetron was a violation of the protocol the ten patients thus treated were included in the intent to treat population upon which subsequent analyses were performed. All analyses were based on 561 eligible patients. Patient demographics, surgery details and medications received are summarised in Table 1. The majority of patients were anaesthetised using volatile agents (78%) and/or opioid anaesthetics (80%). The median time from admission to completion of surgery was 2.1 h (range: 0.1–9.0 h). The median length

Table 1
Patient demography and surgery details at baseline and anaesthesia and medication administered during the study

	n	%
Number of patients	561	
Sex		
Male	176	31
Female	385	69
Median age (±S.D.) years	37 (14)	
Type of surgery		
General surgery	100	18
Obstetrics and gynaecologic	187	33
Orthopaedic	135	24
Gastrointestinal	44	8
Other/Unknown	95	17
Previous surgery	435	78
Previous PONV	101	18
Medication		
Volatile anaesthetic	435	78
Opioid anaesthetic	449	80
Prophylactic anti-emetic	112	20
Treatment anti-emetic	50	9
Post-operative analgesic	311	55

of stay in the day-case unit was 6.6 h (range: 1.0–31.5 h) and the median duration of stay after the operation was 4.4 h (range: 0.3–29.7 h). Five patients were hospitalised following surgery for reasons other than PONV.

3.2. Nausea and vomiting

Pre-operative nausea and vomiting was reported in 41 patients (7%). This was mild or moderate in the majority (73%) of these patients but caused little or no distress. Six patients reported severe nausea and vomiting prior to surgery. The prevalence of PONV is summarised in Table 2. PONV was reported most frequently immediately upon waking from the anaesthetic (93 patients, 17%), and was moderate or severe in 68 of these patients (73%). Ten patients reported that their PONV was extremely distressing and 13 had three or more emetic episodes. Of the 64 patients experiencing PONV upon leaving the hospital, 29 reported their symptoms as moderate (45%) and eight reported severe symptoms (13%). A further 76 patients (14%) experienced PONV while travelling home; this was moderate in 24 patients (32%) and severe in 13 patients (17%). Nausea and vomiting continued in some patients in the days following surgery although steadily decreasing. PONV was much reduced on the 5th day of the study.

Table 3
Anti-emetic agents administered

	n	%
Prophylactic agent	112	
Droperidol	51	46
Metoclopramide	44	39
5-HT_3 receptor antagonists	10	9
Prochlorperazine	4	4
Dimenhydrinate	1	1
Others	2	2
Treatment agent[a]	50	
Droperidol	8	16
Metoclopramide	36	72
5-HT_3 antagonists	10	20
Prochlorperazine	1	2
Others	6	12

[a] Eleven patients received more than one treatment anti-emetic agent.

Anti-emetic use is summarised in Table 3. Prophylactic anti-emetics were given to 112 patients. Droperidol and metoclopramide were the commonly used prophylactic agents and were given to 51 (46%) and 44 patients (39%), respectively. Metoclopramide was the most used anti-emetic administered to 36 of the 50 patients who subsequently required treatment for PONV. The proportion of patients who experienced PONV before discharge from hospital was similar regardless of whether patients had received prophylactic anti-emetics (21%) or not (19%). A similar result was seen in patients who had PONV after discharge (Table 4). The administra-

Table 2
PONV[a]

	None		Mild		Moderate		Severe		Missing data	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Recovery	462	82.4	21	3.7	41	7.3	27	4.8	10	1.8
Leaving hospital	486	86.6	27	4.8	29	5.2	8	1.4	11	2.0
Day 1 (remainder)	467	83.2	31	5.5	32	5.7	13	2.3	18	3.2
Day 2	518	92.3	21	3.7	14	2.5	6	1.1	2	0.4
Day 3	536	95.5	15	2.7	4	0.7	1	0.2	5	0.9
Day 4	539	96.1	11	2.0	2	0.4	2	0.4	7	1.2
Day 5	541	96.4	8	1.4	5	0.9	1	0.2	6	1.1

[a] $n = 561$.

tion of prophylactic anti-emetics did not reduce the severity of PONV: 16% of patients who received prophylactic anti-emetics had moderate or severe PONV, compared with 13% of those who had no prophylaxis. The prevalence of pre-discharge PONV was strongly influenced by surgery type (Table 5). More patients who underwent gastrointestinal procedures had moderate or severe PONV (32%) than obstetric and gynaecological (15%) or general surgical procedures (17%). This was also true post-discharge, although fewer gastrointestinal patients had PONV at this time (27%).

Pre-discharge PONV was most common in patients who had received a combination of volatile anaesthetics and hypnotic agents during surgery, occurring in 35% of patients who received this combination compared with 18% of patients who received hypnotic and opioid anaesthetics (with or without a volatile anaesthetic). Following discharge, the prevalence of PONV was similar in patients who had received a combination of hypnotic, opioid and volatile agents (26%) and volatile and hypnotic agents (27%). The prevalence of post-discharge PONV was low in patients who had hypnotic and opioid anaesthesia (12%).

3.3. Humanistic impact of PONV

The impact of post-discharge PONV was also measured in terms of time lost from work or normal activities due to these symptoms, need for assistance from family and friends and whether carers needed to take time off work. Healthcare resource utilisation was also assessed (visit by doctor or nurse, visit to clinic, admission to hospital). Of the 129 patients who had post-discharge PONV, 45 patients (35%) lost time from work or normal activities. This ranged from half a day (19 patients) to 4 days (three patients) and the median value was 1 day. Forty-two patients needed assistance from friends or family, as a direct result of PONV and 21 carers also needed to take time off work. Three patients required a home visit by a doctor or nurse and five visited a clinic because of PONV. Two patients were admitted to hospital because of PONV. Anti-emetic and pain control medication was used by 130 patients after discharge from hospital. This was prescribed by doctors in 58% of cases; the remainder was purchased from pharmacies. Most of the 23 patients who used anti-emetics after discharge used systemic corticosteroids (ten patients) or metoclopramide (nine patients). Two patients used two different anti-emetic preparations.

3.4. Post-operative pain

Post-operative pain was very common, with 367 patients (65%) reporting pain before discharge from hospital, which was moderate in 184 of these patients (50%) and severe in a further 64 patients (17%). The incidence of pain increased after discharge (412 patients, 73%).

4. Discussion

Most day-case surgical units aim for complete control of PONV and pain prior to discharge. The results from this observational study showed that patients suffered PONV, both in hospital and after discharge. Although PONV decreased with time, some patients reported PONV symptoms up to the fifth day post-surgery. Mild to severe PONV was observed in 16% of patients in the recovery room, in spite of the use of prophylactic and treatment anti-emetics. While the occurrence of PONV is not as high as those reported in one study [4], the figures from the present investigation are comparable to others reported for adult [5] and paediatric patients [6]. These results suggest that PONV is either not adequately recognised or treated in hospital and beyond, or that some of the anti-emetic agents used may be inadequate.

This observational study specifically involved an audit of conventional anti-emetics such as droperidol and metoclopramide which were prescribed to the majority of the patients but about 9% had received ondansetron in violation of the protocol. The data clearly demonstrate that prophylactic administration mainly with the older agents did not appear to be entirely successful, with one fifth of treated patients suffering PONV before discharge and a quarter suffering PONV after discharge. Future observations should be designed to

Table 4
Prevalence of PONV during hospital stay and after discharge home by administration of anti-emetic agents

	PONV before discharge (n (%))			PONV after discharge (n (%))		
	No	Yes[a]	MD[b]	No	Yes[a]	MD
Prophylactic anti-emetic given ($n = 112$)	85 (75.9)	24 (21.4)	3 (2.7)	78 (69.6)	29 (25.9)	5 (4.5)
Prophylactic anti-emetic not given ($n = 448$)	357 (79.7)	86 (19.2)	5 (1.1)	338 (75.4)	99 (22.1)	11 (2.5)

[a] Use of prophylactic anti-emetics for one patient unknown.
[b] MD, missing data.

Table 5
Severity of PONV before discharge by surgery type

Type of surgery	Moderate or severe PONV before discharge (*n* (%))			Moderate or severe PONV after discharge (*n* (%))		
	No	Yes	MD[a]	No	Yes	MD
General surgery ($n = 100$)	83 (83.0)	17 (17.0)	0 (0.0)	81 (81.0)	19 (19.0)	0 (0.0)
Obstetric and gynaecologic ($n = 187$)	157 (84.0)	28 (15.0)	2 (1.1)	162 (86.6)	24 (12.8)	1 (0.5)
Orthopaedic ($n = 135$)	124 (91.9)	10 (7.4)	1 (0.7)	121 (89.6)	12 (8.9)	2 (1.5)
Gastrointestinal ($n = 44$)	30 (68.2)	14 (31.8)	0 (0.0)	32 (72.7)	12 (27.3)	0 (0.0)
Other ($n = 95$)	82 (86.3)	12 (12.6)	1 (1.1)	85 (89.5)	10 (10.5)	0 (0.0)

[a] MD, missing data.

allow comparisons of the use and effectiveness of the older with the newer class of anti-emetics.

In a randomised, double-blind study comparing prophylactic ondansetron and metoclopramide in patients undergoing day-case laparoscopy, 82% of patients who received ondansetron were free from PONV compared with 47% of patients who received metoclopramide [10]. Granisetron was more effective than metoclopramide or droperidol in patients undergoing breast surgery: 83% of patients treated with prophylactic granisetron were free from PONV in the 24-h period following surgery, compared with 57 and 63% of patients who received metoclopramide and droperidol, respectively [11]. In another study 87% of female patients treated with ondansetron were free from PONV in the 3-h period immediately after therapeutic abortion [12].

The occurrence of PONV depends on a variety of factors including the type of surgery and patient characteristics, such as age, gender and past history of PONV. In this study gastrointestinal surgery was associated with the highest incidence of PONV although the numbers of patients undergoing these procedures were small. This was closely followed by general, obstetric and gynaecological surgery. The high incidence of PONV following intra-abdominal surgery [13] is thought to be due to stimulation of vagal afferents during bowel manipulation, as well as the irritation of the bowel and peritoneum caused by inflation of the peritoneal cavity with carbon dioxide during these procedures. In the present study six of 30 patients who underwent ear, nose and throat surgery had PONV. PONV is a common complication of 'bat ear' and middle ear surgery as a result of stimulation of the auriculo–temporal branch of the facial nerve and the labyrinthine pathways, respectively [14]. Gender is another key factor in PONV: 2–4 times more women than men suffer PONV [15]. Nausea and vomiting were significantly more common in female patients who had undergone chemotherapy (79% of female patients versus 69% of male patients, $P = 0.005$) [16]. In developing a risk score for predicting PONV, Apfel et al. [17] identified four predictors, female gender, history of motion sickness or PONV, non-smoking and post-operative opioids. In an observational study of 421 patients undergoing routine surgery, Larsson and Lundberg [18] reported that female gender, balanced anaesthesia, lengthy duration of anaesthesia and abdominal or orthopaedic procedures were the factors most often associated with PONV [18].

The use of opioids is a key factor in PONV, particularly as opioids are widely used in controlling pain, both as a component of balanced anaesthesia and post-operatively. Opioids stimulate nausea and vomiting by acting on a chemoreceptor trigger zone in the area postrema [19]. The degree of PONV experienced depends to some extent on when the opioids were administered, as pre-operative administration results in a higher incidence of PONV [18]. The majority of patients (80%) in the present study received opioids in combination with anaesthetic agents. Of these only 25% received prophylactic anti-emetics, even though the emetogenic potential of opioids is well recognised. Postoperative pain, in particular pelvic and visceral pain, can also lead to PONV [20]. In this situation, nausea is more common than vomiting. Opioids are commonly used to treat postoperative pain in gynaecological and other major surgery. Moderate and severe pain before and after discharge were most common in patients who had undergone obstetric, gynaecological and orthopaedic procedures, patients who also had high incidences of PONV. The use of opioid analgesia in abdominal surgery complicates the issue of PONV, as it is not clear whether the PONV is a result of opioid use, or the surgery itself. While data on pain were collected in this study, an analysis of concomitant drug use was not carried out, and the extent of opioid use in this patient group is unknown. As PONV can increase on movement, an effect on vestibular sensitivity has been suggested. Levels of PONV were higher upon movement in patients in this study, in agreement with this theory. This may also explain the increase in PONV in patients while travelling home from the day case unit.

Humanistic consequences of PONV post-discharge were examined for the 129 patients in this study who reported PONV whilst at home. PONV directly affected

time lost from work and normal activities, with 21 patients taking 1 or more days off work or normal activities. Many patients also needed the assistance of friends and family, with the result that 21 friends and relatives also had to take time off work. Whilst a health economic analysis was beyond the scope of this study it is clear that inadequate control of PONV results in considerable inconvenience to patients who suffer from protracted symptoms. Carroll and et al. [4] reported that patients who experienced PONV following discharge from hospital after day-case surgery were significantly more likely to have impairment of normal activities than those who had no PONV [4]. In this study three patients required home visits by a doctor or nurse, five had to visit a hospital and two needed to be re-admitted to hospital because of PONV. While these numbers are small, they contribute, none the less, to the indirect costs associated with PONV.

Results from this study suggest that inadequate anticipation and control of PONV remains a problem in day-case surgery, in spite of the need to discharge patients who are fully alert and free from pain and PONV. More thorough consideration of risk factors, such as gender, type of surgery, history of nausea and vomiting and the use of older anaesthetic or opioid analgesics, prior to deciding to use anti-emetic agents, should improve patient outcome. It appears, however, that traditional anti-emetics, such as droperidol and metoclopramide, are not always effective in preventing PONV. Published data for the newer agents suggest that the 5-HT_3 antagonists may be more effective in this setting, resulting in less distress to patients and a lower impact on post-discharge activities. Better control of PONV will become increasingly important as day-case surgery increases in popularity with healthcare providers and patients alike. Future observational studies should be designed to compare outcomes with the newer agents.

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References

[1] Cohen MM, Duncan PG, Pope WDP, Wokenstein C. A survey of 112 000 anaesthetics at one teaching hospital (1975–1983). Can Anaesth Soc J 1986;33:22–31.
[2] Watcha MF, White PF. Postoperative nausea and vomiting: its etiology, treatment and prevention. Anesthesiology 1992;77:162–84.
[3] Lerman J. Surgical and patient factors involved in postoperative nausea and vomiting. Br J Anaesth 1992;69(Suppl. 1):24S–32S.
[4] Carroll NV, Meiderhoff P, Cox FM, Hirsch JD. Postoperative nausea and vomiting after discharge from outpatient surgery centers. Anesth Analg 1995;80:903–9.
[5] Ernst EMC, Thwaites RMA. Incidence and impact of pain, nausea and vomiting following discharge from a day surgery unit. J Appl Therap 1997;1:257–63.
[6] Kotiniemi LH, Ryhänen PT, Valanne J, Jokela R, Mustonen A, Poukkula E. Postoperative symptoms at home following day-case surgery in children: a multicentre survey of 551 children. Anaesthesia 1997;52:963–9.
[7] Meeks GR, Waller GA, Meydrech EF, Flautt FH. Unscheduled hospital admission following ambulatory gynecologic surgery. Obstet Gynecol 1992;80:446–50.
[8] Madej TH, Simpson KH. Comparison of the use of domperidone, droperidol and metoclopramide in the prevention of nausea and vomiting following gynaecological surgery in day cases. Br J Anaesth 1986;58:879–83.
[9] Philip BK. Patients' assessment of ambulatory anaesthesia and surgery. J Clin Anesth 1992;77:162–84.
[10] Raphael JH, Norton AC. Antiemetic efficacy of prophylactic ondansetron in laparoscopic surgery: randomized, double-blind comparison with metoclopramide. Br J Anaesth 1993;71:845–8.
[11] Fujii Y, Tanaka H, Toyooka H. Prevention of nausea and vomiting in female patients undergoing breast surgery: a comparison with granisetron, droperidol, metoclopramide and placebo. Acta Anaesthesiol Scand 1998;42(2):220–4.
[12] Alon E, Himmelseher S. Ondansetron in the treatment of postoperative vomiting. A randomised double-blind comparison with droperidol and metoclopramide. Anesth Analg 1992;75:561–5.
[13] Dupeyron JP, Conseiller C, Levarlet M, et al. The effect of oral ondansetron in the prevention of postoperative nausea and vomiting following gynaecological surgery in day cases. Anaesthesia 1993;48:214–8.
[14] Kenny GNC. Risk factors for postoperative nausea and vomiting. Anaesthesia 1994;49(Suppl.):6–10.
[15] Cookson RF. Mechanisms and treatment of post-operative nausea and vomiting. In: Davis CJ, Lake-Bakaar GV, Grahame-Smith DG, editors. Nausea and Vomiting: Mechanisms and Treatment. Berlin: Springer, 1986:130–50.
[16] Osaba D, Zee B, Pater J, Warr D, Latreille J, Kaizer L. Determinants of postchemotherapy nausea and vomiting in patients with cancer. J Clin Oncol 1997;15:116–23.
[17] Apfel CC, Laara E, Koivuranta M, Greim CA, Roewer N. A simplified risk score for predicting postoperative nausea and vomiting: conclusions from cross-validations between two centers. Anesthesiology 1999;91:693–700.
[18] Larsson S, Lundberg D. A prospective survey of postoperative nausea and vomiting with special regard to incidence and relations to patient characteristics, anesthetic routines and surgical; procedures. Acta Anaesthesiol Scand 1995;39:539–45.
[19] Naylor RJ, Inall FC. The physiology and pharmacology of postoperative nausea and vomiting. Anaesthesia 1994;49(Suppl.):2–5.
[20] Hawthorn J. Understanding and Management of Nausea and Vomiting. Oxford: Blackwell, 1995.

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Convalescence and driver reaction time after tension-free inguinal hernia repair

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Abstract

To obtain an objective basis for a policy on the advice to patients on when to drive after anterior tension-free hernia repair. Foot reaction time before operation and on the 2nd postoperative day in 20 skilled male drivers with a right inguinal hernia was measured and compared with that of 30 normal subjects. The tests in a car simulator indicated that an untreated right inguinal hernia had no effect on emergency stop reaction time and that a plug-mesh hernia repair did not impair reaction time on the 2nd postoperative day ($P > 0.30$). Average visual analogue pain scores on the 2nd and 4th postoperative days were 2.3 and 1.7, respectively. On the 8th postoperative day 18 patients had returned to normal activity and work. There was no recurrences after a mean postoperative time of 18 months. These data suggest that open tension-free hernia repair allows return to normal activities and car driving within a few days of the operation.

Keywords: Driver reaction times; Prosthetic inguinal hernia repair

1. Introduction

The most common question asked by patients after inguinal hernia repair is when they can return to normal activity such as work and car driving.

After inguinal hernia repair patients have been advised to limit their physical activity for 4–8 weeks or longer to prevent recurrence [1]. However, there is no factual basis for such advice since recurrence rates seem to be unrelated to early return to work even in heavy manual workers [2–4]. Modern tension-free prosthetic hernia repair has led to a faster return to unrestricted activity and a lower recurrence rate as compared with the standard hernioplasty [5–8].

Although patients may feel comfortable enough to resume car driving an essential requirement for safe driving is the ability to stop rapidly in an emergency. After various types of hernia repairs the emergency stop reaction times have been measured in a car simulator as the time taken to transfer the right foot from the accelerator to the brake pedal. It has been shown that the foot reaction times revert to normal as early as 8–14 days after conventional [9,10] and 6 days after prosthetic hernia repairs [11].

In order to obtain an objective basis for a policy on the advice to patients this study has assessed postoperative pain and recovery, the emergency stop reaction times and the one year recurrence rate after open tension-free hernia repair.

2. Patients and methods

Twenty consecutive skilled male drivers, aged between 20 and 61 years, with a primary right inguinal hernia had an anterior prosthetic repair using a standard technique [12] in which plug and mesh (Bard Marlex Mesh PerFix Plug) were secured in position with interrupted absorbable sutures. The patients were offered general anaesthesia (fentanyl/propofol), but two preferred spinal anaesthesia (lidocaine). They received prophylactic antibiotic and 0.5% bupivacaine hydrochloride was infiltrated into the wound before closure. Lornoxicam 8 mg was given at the end of the operation (intramuscular) and 8 h later (oral). All the patients were discharged the same day, and they were advised to resume normal physical activity and work as soon as they felt able to do so.

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After discharge, the patients received lornoxicam 8 mg b.d. for 4 days and they were provided with tramadol 50 mg (24 tablets) to be taken if required. Unused tablets were returned after 8 days, when the skin suture was removed. They were asked to assess the severity of pain daily for 4 days with the use of a 10-cm visual-analogue scale and to record the use of analgesic drugs.

The ability to perform an emergency stop in a car simulator before operation and on the 2nd postoperative day was measured and compared with that of 30 normal subjects. The system was designed and validated by The Danish Society of Polio and Accident Victims [13]. Foot reaction times were measured in milliseconds (ms) as the time taken to transfer the right foot from the accelerator to the brake pedal. An average of ten responses to light and sound signals were recorded on each test day. The results were expressed as the mean and S.D. for the group. Student's t-test was used for comparisons between groups. All gave informed consent. The study was approved by the regional ethical committee (01-251/98).

3. Results

In this series of patients there were 13 indirect hernias, three direct hernias and four with combined indirect and direct defects.

For normal subjects the mean reaction times to light and sound signals were 416 ± 64 and 375 ± 56 ms, respectively. Before operation and on the 2nd postoperative day the mean reaction times to light signals were 422 ± 61 and 413 ± 56 ms, respectively, and to sound signals 389 ± 55 and 395 ± 52 ms, respectively. No significant differences were found in foot reaction times between the preoperative and the postoperative tests ($P > 0.30$). Within the groups the foot reaction times were significantly longer to light than to sound signals ($P < 0.01$). On the whole there were two patients before and one after operation with markedly longer reaction times than the remainder of the groups (Fig. 1).

All the patients had taken lornoxicam for 4 days as prescribed, and additional oral analgesia was not required in 11 patients. More than 60% of self-administered tramadol (299 tablets) were returned. Seven patients did not complete analogue scales correctly at home. Average pain analogue scores on the 2nd and 4th postoperative days were 2.3 and 1.7, respectively.

At the postoperative visit after 8 days two patients required paracetamol occasionally for postoperative pain. One patient had a small haematoma that resolved spontaneously. All patients, except two without apparent reasons, had returned to normal activity and work.

The 1 year follow-up, with an average of 18 months, revealed no recurrences and no limitations to physical activities. There was no evidence of chronic groin pain following inguinal hernia repair.

4. Discussion

At present the most common open approach to inguinal hernia repair appears to be a tension free prosthetic technique, which has led to greater immediate patient comfort, faster rehabilitation and earlier return to car driving than after conventional hernia repairs.

In our series the open prosthetic plug-mesh repair and postoperative non-steroidal anti-inflammatory medication for 4 days allowed return to normal activity and work within 8 days of operation without significant discomfort and pain. Most of the 20 patients had a sedentary occupation, only three were heavy manual workers.

The tests in the car simulator indicated that an untreated right inguinal hernia had no effect on the emergency stop reaction time and that an open tension-

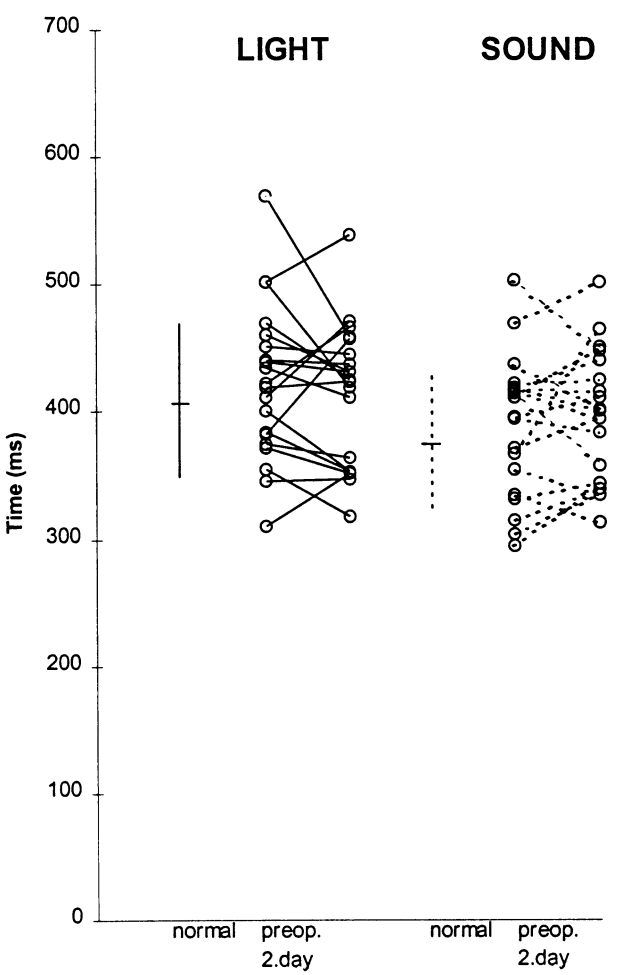

Fig. 1. Foot reaction times (ms, mean ± S.D.s) for normal subjects and for patients before and after operation. —, Light; ···, sound.

free plug-mesh hernia repair did not impair the reaction time on the 2nd postoperative day.

Driving a car is a complex skill requiring only little physical effort except when making an emergency stop. Fear of pain or discomfort may impair such a movement. Because the results are obtained in an experimental situation, the values for foot reaction times may not be directly applicable to driving. However, the individual changes in reaction times compared with preoperative values must give an indication of fitness for driving a car and could be used as a guide in advising patients.

In conclusion, these results provide objective evidence that open tension-free hernia repair allows a return to normal activities and car driving within a few days of operation.

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References

[1] Jarrett MED. Preoperative advice given by general practitioners and consultants to patients concerning return to work. Ann R Coll Surg Engl 1998;80(Suppl.):171–3.

[2] Welsh CL, Hopton DS. Convalescence after herniorrhaphy. Practitioner 1978;221:107–11.

[3] Ross APJ. Incidence of inguinal hernia recurrence. Ann R Coll Surg Engl 1975;57:326–8.

[4] Stoker DL, Wellwood JM. Return to work after inguinal hernia repair. Br J Surg 1993;80:1354–5.

[5] Rutkow IM, Robbins AW. 'Tension-free' inguinal herniorrhaphy: a preliminary report on the 'mesh plug' technique. Surgery 1993;114:3–8.

[6] Shulman AG, Amid PK, Lichtenstein IL. Returning to work after herniorrhaphy. Br Med J 1994;309:216–7.

[7] Stoker DL, Spiegelhalter DJ, Singh R, Wellwood JM. Laparoscopic versus open inguinal hernia repair: randomized prospective trial. Lancet 1994;343:1243–5.

[8] Liem MSL, van der Graaf Y, van Steensel CJ, et al. Comparison of conventional anterior surgery and laparoscopic surgery for inguinal-hernia repair. New Engl J Med 1997;336:1541–7.

[9] Wastell C, Wise I, Colin JF, Wilson AJ. A brake–clutch simulator. Br J Surg 1971;58:294.

[10] Welsh CL, Hopton D. Advice about driving after herniorrhaphy. Br Med J 1980;i:1134–5.

[11] Wright DM, Hall MG, Paterson CR, O'Dwyer PJ. A randomized comparison of driver reaction time after open and endoscopic tension-free inguinal hernia repair. Surg Endosc 1999;13:332–4.

[12] Goyal S, Abbasakoor, Stephenson BM. Experience with the preperitoneal 'plug and patch' inguinal hernia repair. Br J Surg 1999;86:1284–1285.

[13] Bøgh HE, Poulsen E. Investigations on the demand/ability relation in handicapped motorists. Commun Dan Nat Assoc Infant Paralys 1967;26:1–16.

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Giant inguino-scrotal bladder hernia Report of a case

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Abstract

Bladder hernia is very uncommon. It tends to affect patients over the age of 50 and is predisposed by cervico-urethral obstruction. The condition is often diagnosed during inguinal hernia surgery. The authors report a case of massive inguino-scrotal bladder herniation. The different types of bladder hernia are described, and the clinical-radiological findings and surgical management are discussed.

Keywords: Bladder hernia; Cystocele; Surgery

1. Introduction

Bladder hernias often go unnoticed. It is relatively common to detect minor bladder herniation in the course of herniorraphy in coexistence with hernia pathology. The incidence ranges from 1 to 10% [1] and the condition must be distinguished from less frequent massive bladder hernia or scrotal cystocele.

The present study describes a case of massive bladder hernia and reviews the epidemiological, diagnostic and therapeutic characteristics of this pathology.

2. Patient and methods

A 39-year-old male presented with a past history of left inguinal herniorraphy in childhood and appendectomy. For 2 months he had suffered pollakiuria, dysuria and urgency coinciding with the finding of a right inguinal mass. Examination revealed a painless, non-reducible right inguino-scrotal hernia, clinically suggestive of a bladder hernia. Cystography (Fig. 1) revealed the presence of a right inguino-scrotal cystocele.

Surgery under spinal anaesthesia confirmed the presence of over half of the bladder within the hernia sac. The bladder hernia was reduced and a hernioplasty was performed using a modification of the Lichtenstein technique [2], comprising plasty without transverse fascial tension, running from the arch of the transverse muscle to the iliopubic tract, and followed by the placement of a polypropylene mesh adapted to the passage of the inguinal cord and fixed to the common tendon, transverse muscle and inguinal ligament with monofilament sutures.

The postoperative course was uneventful, with spontaneous micturition. The patient remains asymptomatic following discharge.

3. Discussion

Bladder hernias of the abdominal wall were first described by Guy de Chauliac in 1363, and by Verdier in 1753 [3]. These conditions account for 1–10% of all hernias and generally affect males over the age of 50 [4]. In 75% of cases they are associated with an inguinal hernia [5], in 23% with a femoral hernia, and in the remaining 2% to other types of hernia (obturator, perineal and umbilical) [6].

Bladder hernias have also been reported following surgery, particularly herniorraphy, secondary to possible traction of the sutures upon the bladder wall and peritoneum [7]. Herniation as a result of traumatic pubic diastasis is much less common [8].

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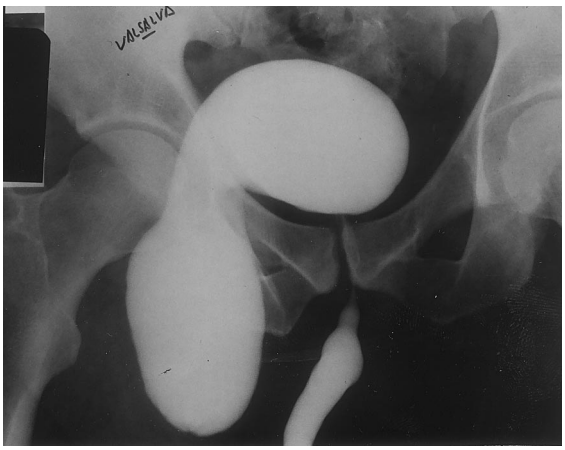

Fig. 1. Cystography (valsalva view) with the presence of inguino-scrotal cystocele.

These hernias mainly affect patients with micturition difficulties. Increased bladder pressure, resulting in progressive bladder wall hypertrophy and the development of multiple vesical diverticuli or more frequently, an area of diminished resistance in intimate contact with the bladder coexists in the early stages of obstruction [7–9] facilitating possible herniation of the entire bladder wall [7]. The possibility of associated pathology must therefore be considered in such patients.

Three types of bladder hernia can be identified according to the anatomical relations with the herniated peritoneal sac [9], (a) *paraperitoneal*, where the bladder accompanies the descent of the peritoneal hernial sac (this being the most frequent presentation); (b) *extraperitoneal*, generally involving smaller and less frequent herniations through an area at marked muscle weakness, and occasionally accompanied by the distal portion of the ureter and (c) *intraperitoneal*, where the bladder is entirely covered by the peritoneum. The latter presentation is usually easily reduced and may be of considerable size.

Most bladder hernias are asymptomatic and generally constitute incidental findings in the course of surgery. Occasionally, they may be associated with nonspecific urinary manifestations such as dysuria, pollakiuria and repeated urinary infections. Hernias of large size can in turn yield two characteristic signs, the presence of an inguino-scrotal tumour mass that disappears with micturition, and two-step micturition (Mery's sign) urine stream intensity being intensified by elevating or compressing the scrotum and groin [10,11].

Bladder hernias are diagnosed preoperatively [5] in only 7% of cases, while 16% are identified following surgery due to the development of complications resulting from bladder injury during the operation (bladder-cutaneous fistulisation or sepsis).

Cystography is the most useful imaging technique in such patients [4] and proved conclusive in our case. Urography is necessary to assess the upper urinary system, though bladder hernias may occasionally go undetected [10]. Orthostatism and dorsal decubitus are the best radiographic positions for visualising the hernia [11]. Echography and computed tomography (CT) are complementary explorations that may be particularly useful in the presence of associated urinary tract pathology [11].

Bladder participation in inguinal hernias does not modify either surgical indications or strategy. Management consists of fully reducing the bladder and repairing the abdominal wall. Resection of the herniated bladder zone is to be avoided, to reduce the risk of urethral damage and preserve bladder capacity [11]. In the event of bladder damage, suturing is required, with bladder reconstruction and drainage for 8–10 days. This results in increased morbidity and a longer hospital stay.

Preoperative investigation of a bladder hernia is very useful to avoid damaging the bladder and/or ureter during herniorraphy. The presence of a tumour mass that disappears with micturition, two-step micturition, or any urinary symptom associated with the hernia is suggestive of a bladder hernia. In such cases, cystography prior to herniorraphy or hernioplasty is indicated to confirm the diagnosis.

References

[1] Lévin B. Scrotal cystocele. J Am Med Assoc 1951;147:1439–41.
[2] Castaño S, Zaragoza C, Villalba S, Asensi J, Fuster CA, Trullenque R. Hernioplastia sin tensión con malla de polipropileno. Modificación personal de la técnica de Lichtenstein, Cir Esp. 1995;38–41.
[3] Debre B, Chiche R. Hernies de la vessie. Encycl Méd Chir 1982;18217-A:10–1.
[4] Benchekroun A, Lachkar A, Soumana A, Frih MH, Belahech Z, Marzouk M, Faik M. Les hernies inguinales de la vessies. A propos de 6 cas. Ann Urol 1999;33(2):67–70.
[5] Watson LF. Hernia: Its Anatomy, Etiology, Symptoms, Diagnosis, Differential Diagnosis, Prognosis and Treatment. St. Louis: CV Mosby Co, 1948.
[6] Martinez-Pineiro L, Cozar JM, Carcamo P, Navarro J, Garcia-Matres MJ, Martinez-Pineiro JA. Hernia vesical inguinoescrotal gigante. Arch Esp Urol 1990;43:900–3.
[7] Server G, Lopez P, Hita G, et al. Hemias vesicales. A propósito de cuatro casos. Actas Urol Esp 1994;18:670–2.
[8] Jackes LF, Globizki P, Patterson DE, et al. Successful repair of an unusual hernia associated with traumatic pubic diastasis. Mayo Clin Proc 1998;63:492–4.
[9] Shultze KA, Wettlaufer JN. Ventral bladder hernia following Marshall- Marchetti-Krantz procedure for stress urinary incontinence. Urology 1986;28:114–6.
[10] Luján M, Romero L, Paéz A. Hernia inguinal que contiene vejiga urinaria. Descripción de un caso. Arch Esp Urol 1997;50:120–2.
[11] Pasquale MD, Shabahang M, Evans SR. Obstructive uropathy secondary to massive inguinoscrotal bladder herniation. J Urol 1993;150:1906–8.

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Clinical factors influencing return to work after ambulatory inguinal herniorrhaphy in Hong Kong

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Abstract

Ambulatory inguinal hernia repair is the commonest day case general surgery operation. The present study was conducted to evaluate factors influencing the contemporary pattern of convalescence following ambulatory inguinal hernia repair in Hong Kong. A total of 271 consecutive ambulatory inguinal hernia repairs were performed at a day surgery centre from December 1995 to December 1998. The convalescent period prior to resuming work was analysed by multi-variate analysis with respect to significant clinical variables. A sick leave of 3 weeks was adequate for most patients following uncomplicated ambulatory inguinal hernia repairs. Factors associated with early return to work included age $\leqslant 50$ years, indirect inguinal hernia and sedentary occupation. Occupation was the only independent factor affecting the duration of time off work on multi-variate analysis.

Keywords: Day case; Survey; Convalescence; Inguinal hernia; Chinese

1. Introduction

Ambulatory inguinal hernia repair is the commonest day case operation [1]. Day surgery has been regarded as a cost-effective and patient-centred quality service [2–4]. In contrast to Western surgical centres, where day surgery has been in practice for more than 20 years, ambulatory surgery was introduced in most Asian countries in the last decade. The convalescence pattern following ambulatory inguinal hernia repair has not been reported in Asians. We conducted a survey to identify significant factors influencing the convalescence period after ambulatory inguinal hernia repairs and recommend an appropriate duration of sick leave for future patients.

2. Subjects and methods

From December 1995 to December 1998, 271 ambulatory inguinal hernia repairs in 259 consecutive patients were performed at our Day Surgery Centre, Tung Wah Hospital, The University of Hong Kong Medical Centre. There were 240 men and 19 women. A telephone survey was conducted in 1999. The occupations of the patients were documented and classified into sedentary (clerical), light duty, heavy duty and retired. Heavy-duty workers refer to manual workers who need to lift heavy objects. Subjects were asked the duration of their post-operative convalescence period prior to the resumption of their jobs and normal activities. All the respondents' hospital records were then reviewed. The operative records, including the operation technique and hernia anatomy, were documented. Post-operative morbidity rate was recorded.

2.1. Statistical analysis

Statistical comparisons of the duration of time off work and time to resume normal activities were analyzed by Student's t-test or one-way analysis of variance (ANOVA) with respect to five clinical variables, including age, sex, occupation, hernia anatomy and operative repair method. Significant variables were then chosen for multiple regression analysis to identify independent factors influencing the time off work. Differences were considered significant if the P-value was less than 0.05. Values are expressed as means $\pm$ S.E.M.

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3. Results

3.1. Demographic features and clinical outcomes

A total of 149 patients completed the telephone survey, leading to a response rate of 57.5%. There were 134 men and 15 women. The mean age of the study population was 49 ± 15.7 (S.D.) years. The occupations of the patients were sedentary ($n = 48$), light duty ($n = 58$), heavy duty ($n = 15$) and retired ($n = 28$). Operative methods included nylon darn ($n = 98$), Bassini repair ($n = 29$) and Prolene mesh hernioplasty ($n = 22$). The operative findings were indirect inguinal hernia ($n = 92$), direct inguinal hernia ($n = 46$), pantaloon inguinal hernia ($n = 6$), sliding hernia ($n = 3$) and recurrent direct inguinal hernia ($n = 2$).

Of these 149 patients, 146 (98%) were discharged on the day of operation. Three patients were admitted to hospital after operation because of dizziness ($n = 1$), hyperglycaemia ($n = 1$) and haemoptysis ($n = 1$). All patients were followed up at our clinic 1–2 weeks after operation. One patient was readmitted because of fever and was later diagnosed to have pulmonary tuberculosis. Two patients had post-operative complications, including scrotal swelling ($n = 1$) and wound haematoma ($n = 1$), which resolved spontaneously. All other patients ($n = 143$) had uneventful recovery.

3.2. Time away from work

The overall mean duration of time off work ($n = 121$) was 2.8 ± 0.29 (S.E.M.) weeks. Table 1 compares the time off work among different clinical variables. Young patients (≤ 50 years) who had a sedentary job and an indirect inguinal hernia returned to work significantly earlier. Occupation was the only independent factor affecting the duration of time off work on multiple regression analysis.

3.3. Time to resumption of normal activities

The overall mean convalescent period prior to resuming normal activities ($n = 149$) was 4.1 ± 0.27 (S.E.M.) weeks. Table 2 compares the time to return to normal activity among different clinical variables. Only the type of occupation influenced the duration of recovery prior to resumption of normal activities.

4. Discussion

Inguinal hernia repair is one of the commonest operations in the world. More than 500 000 repairs are performed in USA per annum [5]. The total number of days off work in patients with hernia repairs has significant implications for the economy. In the 1970s and 1980s, patients often took 2–3 months off work after inguinal hernia repair [6–9]. In the past 2 decades the reported convalescence period following inguinal hernia repair has been decreasing [10,11]. In the present study most of our patients returned to work in 3 weeks, which was comparable with recent reports in the UK [10,11].

Increased risk of hernia recurrence is a main concern of patients with respect to early return to work [12]. Lichtenstein et al. [13] showed that sutured wound maintained a 70% strength of the intact tissue during the first two months following hernia repair. In the light of this observation, normal physical exertion is permitted following hernia surgery. Immediate resumption of normal activities is recommended as long as the patient can carry out the activity comfortably [14]. Normal activity has not been shown to increase the risk of hernia recurrence or jeopardize wound healing [15,16]. A hernia recurrence rate of less than 1% was reported in over 2000 patients who resumed normal activity immediately after operation [17].

Consistent with previous findings, heavy duty workers returned to work significantly later than sedentary workers [10,18]. Thorup et al. [18] demonstrated an independent significant correlation between the load of occupation and the length of sick leave. Patients with active and heavy work duties took a median sick leave

Table 1
Clinical factors associated with early return to work[a]

Clinical variables	Weeks to return to work	*P*
Age		0.04†
Age ≤50 years ($n = 58$)	2.5 ± 0.24	
Age ≥50 years ($n = 54$)	3.1 ± 0.55	
Sex		0.38†
Male ($n = 103$)	2.8 ± 0.32	
Female ($n = 9$)	2.7 ± 0.37	
Occupation		<0.001*
Sedentary ($n = 48$)	1.9 ± 0.19	
Light duty ($n = 58$)	2.7 ± 0.42	
Heavy duty ($n = 15$)	5.7 ± 1.33	
Hernia anatomy		0.02†
Indirect inguinal hernia ($n = 75$)	2.6 ± 0.24	
Direct inguinal hernia ($n = 34$)	3.2 ± 0.82	
Operative methods		0.06*
Nylon darn ($n = 78$)	2.3 ± 0.29	
Bassini herniorrhaphy ($n = 19$)	3.9 ± 1.05	
Mesh hernioplasty ($n = 15$)	3.6 ± 0.76	

[a] Figures represent mean ± S.E.M.
† Student's *t*-test.
* ANOVA.

Table 2
Clinical factors associated with early resumption of normal activities[a]

Clinical variables	Weeks to return to normal activities	*P*
Age		0.12†
Age ≤50 years ($n = 66$)	4.5 ± 0.49	
Age ≥50 years ($n = 80$)	3.8 ± 0.27	
Sex		0.57†
Male (n = 131)	4.1 ± 0.29	
Female (n = 15)	3.7 ± 0.64	
Occupation		0.04*
Sedentary ($n = 46$)	3.7 ± 0.39	
Light duty ($n = 57$)	4.9 ± 0.55	
Heavy duty ($n = 15$)	4.8 ± 0.60	
Retired ($n = 28$)	2.9 ± 0.31	
Hernia anatomy		0.14†
Indirect inguinal hernia ($n = 94$)	4.0 ± 0.29	
Direct inguinal hernia ($n = 45$)	4.6 ± 0.61	
Operative methods		0.76*
Nylon darning ($n = 96$)	4.1 ± 0.37	
Bassini herniorrhaphy ($n = 28$)	4.5 ± 0.46	
Mesh hernioplasty ($n = 22$)	3.9 ± 0.51	

[a] Figures represent mean ± S.E.M.
† Student's *t*-test.
* ANOVA

of 7 weeks. The impact of occupation on convalescence seems to be universal in all countries. Reasons for the late return to work in these manual workers included patients' apprehension of recurrence and pain induced by heavy weight lifting. However, prolonged time off work had no correlation with the recurrence rate [19]. Rider et al. [10] attributed the late return to work to the inappropriate advice from general practitioners. It was a misconception of primary health care physicians, as well as patients, that early activity might adversely affect their recovery and increase the risk of hernia recurrence. Jarrett [20] highlighted the great variability in advice on when to return to work given by both general practitioners and consultants. Education of patients and physicians concerning the appropriate time of return to work are, therefore, essential [10,20,21]. Patients should be advised and encouraged to return to work once they feel comfortable [9].

Compared to a few studies in the UK our patients appeared to return to work slightly earlier than our Western counterparts [10,11]. The decision of returning to work was mainly based on patients' own assessment of their physical conditions. A less well established social security system in our territory may be accountable for the difference. As prolonged sick leave may result in loss of income or even the job, economic consideration is a major impetus in returning to work early. Barwell [15] also reported that self-employed men were better motivated and most of these patients (80%) returned to work by 3 weeks. On the other hand, patients who received occupational compensation for work-related hernias have been shown to have longer recovery times and more prolonged post-operative pain than those who have commercial insurance in the USA [22].

Concerning the time to resume normal activities, patients with heavy duty occupations also required a longer convalescence period than those with light or sedentary occupations. This reflects that these heavy-duty workers consider that they have not regained full working capacity before returning to work.

In conclusion most Chinese patients managed to return to work within 3 weeks following ambulatory inguinal hernia repairs. A sick leave of 3 weeks seems to be appropriate for most patients after uncomplicated ambulatory inguinal hernia repairs. The nature of job was the only independent factor affecting the duration of time off work. During the pre-operative counselling of patients with inguinal hernias any misconceptions about the convalescence period should be clarified and patients should be encouraged to return to work once they feel comfortable.

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References

[1] Rutkow IM, Robbins AW. Demographic, classificatory, and socioeconomic aspects of hernia repair in the United States. Surg Clin North Am 1993;73:413–26.
[2] Ruckley CV, Maclean M, Ludgate CM, Espley AJ. Major outpatient surgery. Lancet 1973;2:1193–6.
[3] Russell IT, Devlin HB, Fell M, Glass NJ, Newell DJ. Day-case surgery for hernias and hemorrhoids. Lancet 1977;1:844–7.
[4] Ruckley CV. Day care and short stay surgery for hernia. Br J Surg 1978;65:1–4.
[5] Rutkow IM. Epidemiologic, economic, and sociologic aspects of hernia repair in the United States in the 1990s. Surg Clin North Am 1998;78:941–51.
[6] Bourke JB, Lear PA, Taylor M. Effect of early return to work after elective repair of inguinal hernia: clinical and financial consequences at one and three years. Lancet 1981;2:623–5.
[7] Semmence A, Kynch J. Hernia repair and time off work in Oxford. J R Coll Gen Pract 1980;30:90–6.
[8] Welsh CL, Hopton DS. Convalescence after herniorrhaphy. Practitioner 1978;221:107–11.

[9] Taylor EW, Dewar AP. Early return to work after repair of unilateral inguinal hernia. Br J Surg 1983;70:599–600.
[10] Rider MA, Baker DM, Locker A, Fawcett AN. Return to work after inguinal hernia repair. Br J Surg 1993;80:745–6.
[11] Robertson BSM, Haynes IG, Burton PR. How long do patients convalesce after inguinal herniorrhaphy? Current principles and practice. Ann R Coll Surg Engl 1993;75:30–3.
[12] Kerry RL. Repair and convalescence after herniorrhaphy and appendectomy. J Am Med Assoc 1971;218:740.
[13] Lichtenstein IL, Herzikoff S, Shore JM, Jiron MW, Stuart S, Mizuno L. The dynamics of wound healing. Surg Gynecol Obstet 1970;130:685–90.
[14] Iles JD. Convalescence after herniorrhaphy. J Am Med Assoc 1972;219:385–8.
[15] Barwell NJ. Recurrence and early activity after groin hernia repair. Lancet 1981;2:985.
[16] Bourke JB, Taylor M. The clinical and economic effects of early return to work after elective inguinal hernia repair. Br J Surg 1978;65:728–31.
[17] Lichtenstein IL, Shore JM. Exploding the myths of hernia repair. Am J Surg 1976;132:307–15.
[18] Thorup J, Jorgensen T, Kjaergaard J, Billesbolle P. Convalescence after inguinal herniorrhaphy. Scand J Gastroenterol 1994;29:1150–2.
[19] Ross APJ. Incidence of inguinal hernia recurrence; effect of time off work after repair. Ann R Coll Surg Engl 1975;57:326–8.
[20] Jarrett MED. Preoperative advice given by general practitioners and consultants to patients concerning return to work. Ann R Coll Surg Engl 1998;80:171–3.
[21] Stock SE. Return to work after inguinal hernia repair. Br J Surg 1993;80:1489.
[22] Salcedo-Wasicek MC, Thirlby RC. Postoperative course after inguinal herniorrhaphy. A case-controlled comparison of patients receiving worker's compensation vs. patients with commercial insurance. Arch Surg 1995;130:29–32.

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The impact of postoperative nausea and vomiting on the practice of day surgery for Chinese women with breast diseases

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Abstract

Background: Day surgery for breast disease is becoming popular but a key limiting factor of success is the development of postoperative nausea and vomiting (PONV). *Methods:* A prospective study of PONV was conducted on 62 patients undergoing breast surgery under general anaesthesia. Lumpectomy was performed in 40 patients. The other 22 patients underwent major breast operations including modified radical mastectomy and wide local excision and axillary dissection. A total of 10 mg of metoclopramide was injected intravenously on induction of anaesthesia and oral metoclopramide was prescribed as required to treat PONV. *Results:* PONV occurred in six (15%) and 14 (63.6%) patients undergoing minor and major operations respectively. The onset of PONV occurred earlier following minor than major operations. Eleven patients required antiemetics. Univariate analysis showed that the incidence and the first onset of PONV was significantly associated with major breast operation and duration of operation. Multiple regression analysis demonstrated that duration of operation was the only independent factor that affects the rate of PONV. However, the onset of nausea was associated with major surgery and the onset of vomiting with the duration of the operation. Patients with minor breast surgery were all discharged on the day of surgery. None of the six patients with PONV required readmission. *Conclusion:* Minor breast surgery can be readily performed as a day case. More effective antiemetic measures against PONV may be required in major breast surgery.

Keywords: Nausea; Vomiting; Chinese; Breast; Surgery

1. Introduction

The most common and distressing symptoms following surgery are pain and emetic problems. Pain causes the greater amount of suffering, particularly after major surgery. However, in some instances nausea and vomiting may be more distressing especially after minor surgery. Persistent nausea and vomiting may result in dehydration, electrolyte imbalance, tension on suture lines, venous hypertension and increased bleeding under skin flaps. There is also an increased risk of pulmonary aspiration of vomitus if airway reflexes are depressed from the residual effects of anaesthetic drugs.

It is evident that postoperative nausea and vomiting (PONV) is affected by multiple factors. The incidence of PONV increases with the duration of operations [1–3]. PONV is more common in paediatric patients than in adults with a peak incidence in the preadolescent group (11–14 years). PONV in adult females is approximately two to three times more common than that in adult males. There is a positive correlation between body weight and PONV. Patients with a high level of preoperative anxiety and those with a history of vomiting after previous operations or motion sickness are at increased risk of developing emetic symptoms [1–3]. The incidence of PONV is also influenced by the type of surgical procedure, irrespective of the anaesthetic technique used. Certain operations are associated with a greater frequency of postoperative emesis, for example, intra-abdominal surgery, ear surgery, head and neck surgery, strabismus surgery and orchidopexy [1–3].

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The impact of PONV on the practice of day surgery is great. PONV may also have important economic implications especially when intractable vomiting leads to hospitalisation. Although the problem could be reduced with the modification of anaesthetic techniques, patients may still have PONV when surgery is performed under heavy sedation. Minor breast surgery like lumpectomy is readily performed as day surgery using the modified technique. The acceptance of such practice has prompted surgeons to perform major breast surgery as day cases as well. The relationship between breast surgery and PONV has rarely been studied. We report a prospective study on the incidence of PONV after major and minor breast surgery and examine whether PONV would limits the practice of day surgery for breast disease.

2. Patients and methods

This study was carried out on 62 patients who had breast surgery performed under general anaesthesia. All the patients were female aged between 18 and 66 years and the mean age was 40. A total of 40 of them underwent minor breast surgery, namely excision of a breast lump. The other 22 patients had major operations including modified radical mastectomy and wide local excision and axillary dissection.

In all cases, induction of general anaesthesia was performed with thiopentone. Anaesthesia was maintained with nitrous oxide and isoflurane. Postoperative analgesia was provided by dologesic and intramuscular demerol. A standard antiemetic regimen of intravenous metoclopramide 10 mg injected prophylactically during induction was used for all patients. Duration of each operation was recorded.

Postoperatively, the incidence of nausea and vomiting were recorded every four hours. Vomiting is defined as a forceful expulsion of gastric contents via the mouth and nausea an unpleasant but not painful sensation referred to the pharynx and upper abdomen, associated with a desire to vomit or feeling that vomiting is imminent [4]. Patients with nausea or vomiting were treated with oral metoclopramide. The amount of metoclopramide taken and length of postoperative hospital stay of each patient were recorded.

2.1. Statistical analysis

Statisitcal analysis was performed by using the SPSS statistical package program (SPSS, Los Angeles, California). The relationship between PONV and different variables was analyzed by using independent sample t-test and Pearson correlation test. Multiple regression analysis was adopted to identify independent variables which affect postoperative nausea and vomiting. A P-value of 0.05 or less was considered statistically significant.

3. Results

Postoperative nausea and/or vomiting occurred in 20 patients. Fourteen patients had up to four episodes of nausea and 18 patients up to four episodes of vomiting. A total of 11 patients required metoclopramide to control the symptoms. Seven of them required 10 mg and the other four patients required 20 mg.

Six patients who underwent minor breast operations developed nausea and/or vomiting which occurred in 14 patients following major breast surgery performed (Fig. 1). By using independent sample t-test, the incidence of PONV was found to be significantly higher after major than minor breast operations (t-value = 3.51; $P = 0.01$).

Patients undergoing minor surgery were younger. The mean age was 37.4 (S.E. 1.9) years for patients undergoing minor surgery whereas the figure was 46.1 (S.E. 2.6) years for major surgery. The difference was statistically significant (t-value, 2.68; $P = 0.01$). However, when analysis was performed correlating PONV with age, no statistical correlation was demonstrated.

The duration of operations ranged from 10 to 150 min. All minor breast operations were finished within 45 min with a mean of 24 min. The major breast operations took 60–150 min with a mean duration of 98 min. The relationship between the incidence of PONV and duration of operation is shown in Fig. 2. The occurrence of PONV correlated significantly with duration of operations (correlation coefficient, 0.48; $P < 0.01$).

The onset of symptoms occurred shortly after operation in all cases, with earlier onset after minor surgery. The mean time of onset of nausea for minor and major surgery was 0.03 (S.E. 0.003) and 1.22 (S.E. 0.54) h, respectively. The difference was statistically significant (t-value, 2.18; $P = 0.04$). The onset of vomiting fol-

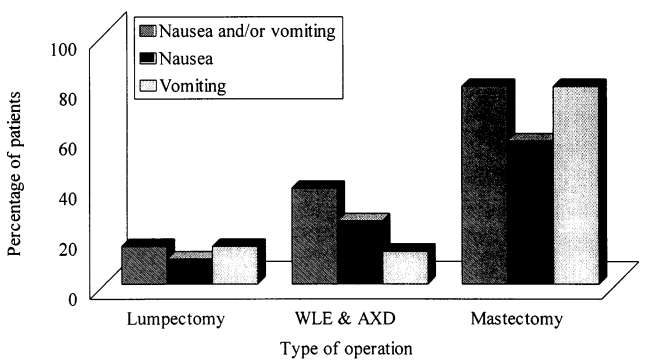

Fig. 1. The relationship between nausea and/or vomiting and type of operation.

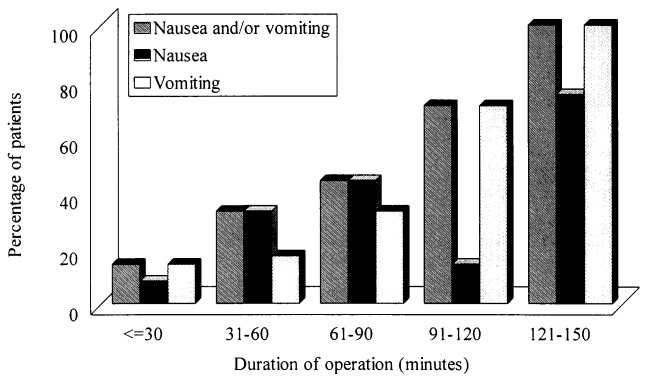

Fig. 2. The relationship between nausea and/or vomiting and duration of operation.

lowed a similar pattern. The mean time of onset of vomiting for the corresponding groups was 0.31 (S.E. 0.18) and 3.42 (S.E. 1.2) h, respectively. The difference was also statistically significant (t-value, 2.54; $P = 0.019$). The influence of the duration of operation on the onset of symptoms was also studied. There was a significant positive correlation of duration with the first onset of nausea (correlation coefficient, 0.30; $P = 0.025$) and vomiting (correlation coefficient, 0.36; $P = 0.007$).

PONV settled faster after minor than major surgery. The duration of symptoms for minor and major surgery was 5.7 (S.E. 0.41) and 8.4 (S.E. 0.72) h, respectively. The difference was statistically significant (t-value, 3.3; $P = 0.03$). All patients with minor breast operations performed could be discharged on the day of operation. None of these patients required readmission.

Multiple regression analysis was carried out on factors significantly associated with the occurrence of PONV. It was confirmed that duration of operation was the only independent factor that determined postoperative nausea ($B = 0.02$; $P = 0.014$) and vomiting ($B = 0.03$, $P = 0.019$). With regards to the first onset of symptoms, regression analysis showed that major surgery was significantly associated with nausea ($B = 1.25$; $P = 0.01$) and duration of operation was the significant factor for vomiting ($B = 0.30$; $P = 0.01$).

4. Discussion

This study showed that the duration of operation is the only independent factor that affects the incidence of postoperative nausea and vomiting. Similar findings have been demonstrated by other investigators. Bellville reported an almost three fold greater incidence of postoperative nausea and vomiting after surgery in parallel with an increase in the duration of operation [5]. The relationship between duration of surgery and PONV is not easily explained. Increased effects of anaesthetic drugs after prolonged operation may contribute to the increased incidence of PONV. Several mechanisms have been suggested to explain why anaesthetic agent causes postoperative emesis. Anaesthetic drugs may stimulate the sympathetic nervous system and increase the amount of circulatory catecholamines. Emesis then occurs due to the direct effect of catecholamines on the chemoreceptor trigger zone in the area postrema [4].

PONV may also occur because of the action of anaesthetic drugs on the antiemetic centre. This area of the brain stem inhibits the emetic centre and prevents emesis when it is active. It is possible that PONV occurs because the antiemetic centre is very sensitive to the depressant effects of anaesthetics and is slow to recover its tonic activity in the postoperative period. Thus PONV may result from both a direct emetic effect of the anaesthetics and an indirect effect of prolonged inhibition of the antiemetic centre [4].

Anaesthetics may disrupt mucosal enterochromaffin cells of the gastrointestinal tract and induce release of 5HT resulting in afferent vagal firing and initiation of the vomiting reflex. 5HT itself is also an important neurotransmitter which activates the emetic centre in the brain stem. There is considerable evidence that some anaesthetics increase the synthesis of 5HT [4,6].

The endocrine effects of anaesthetic drugs are complex. Anaesthetics may increase the production of a number of peptide hormones, including angiotensin II, gastrin, neurotensin and somatostatin, which have been shown to induce emesis [4]. They may also cause suppression of gastric and small intestinal motility and thus inducing PONV. The vasodilatory effects of anaesthetics on cerebral blood vessels may result in an increase in intracranial pressure. Such disturbance could contribute to PONV.

Rising hospital costs have focused attention on limiting the length of stay of postoperative patients. Increasing numbers of surgical operations have been performed as day cases since 1970. Splinter has recently shown that the incidence of unanticipated admission after day case surgery was $\sim 1\%$; 18% of these admissions were due to nausea and vomiting [7]. It is apparent that PONV is still a problem for day case surgery. The minor breast surgery in our study was performed on a day basis. Five of the 40 patients experienced one episode and one patient two episodes of vomiting postoperatively. The results of our antiemetic regimen (i.e. prophylactic intravenous metoclopramide on induction of anaesthesia and postoperative oral metoclopramide for control of nausea and vomiting) seem satisfactory as none of the patients in this group required readmission.

For major breast surgery, studies have shown that the postoperative morbidity rate following mastectomy was not increased with significantly shortened hospital stay. The incidence of complications such as wound infection and seroma formation was not increased even

in patients discharged before removal of drains successful. Reduction in hospital stay of three to six days after major breast operations have been reported with success [8–11]. A substantial reduction in hospital costs could be achieved without the expense of increased patient morbidity [9,10]. If the strategy for minor breast surgery is applied, it is apparent that the only limiting factor to perform major breast operations as day cases is PONV. For the group of 22 patients who had major breast operations performed, 14 out of the 22 patients had postoperative nausea and/or vomiting. Only one third of patients were free from emetic symptoms. The efficacy of the standard antiemetic regimen was obviously unsatisfactory, if these cases are to be performed as day surgery. Modification of this antiemetic regimen or the use of more potent antiemetic drugs may allow major breast operations to be carried out as day cases, when PONV is better controlled.

References

[1] Watcha MF, White PF. Postoperative nausea and vomiting. Its etiology, treatment and prevention. Anaesthesiology 1992;77:162–84.

[2] Lerman J. Surgical and patient factors involved in postoperative nausea and vomiting. Br J Anaesth 1992;69(Suppl. 1):24S–32S.

[3] Korttila K. The study of postoperative nausea and vomiting. Br J Anaesth 1992;69(Suppl. 1):20S–3S.

[4] Andrews PLR. Physiology of nausea and vomiting. Br J Anaesth 1992;69(Suppl. 1):2S–19S.

[5] Bellville JW, Bross IDJ, Howland WS. Postoperative nausea and vomiting IV: factors related to postoperative nausea and vomiting. Anaesthesiology 1960;21:186–93.

[6] Bunce KT, Tyers MB. The role of 5-HT in postoperative nausea and vomiting. Br J Anaesth 1992;69(Suppl. 1):60S–2S.

[7] Splinter WM, Paradis RN. Unexpected admission after pediatric ambulatory surgery — a 4-year review. Anesth Analg 1997;84:S26.

[8] Cohen AM, Schaeffer N, Chen ZY, Wood WC. Early discharge after modified radical mastectomy. Am J Surg 1986;151:465–6.

[9] Orr RK, Ketcham AS, Robinson DS. Early discharge after mastectomy: a safe way of diminishing hospital costs. Am Surg 1987;53:161–3.

[10] Edwards MJ, Broadwater JR, Bell JL, Ames FC, Balch CM. Economic impact of reducing hospitalization for mastectomy patients. Ann Surg 1988;208(3):330–6.

[11] Tarazi R, Eselstyn CB, Kuivila J, Hardesta I. Early hospital discharge following mastectomy. Cleve Clin Q 1984;51:579–84.

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Effectiveness of a clinical guide for the treatment of postoperative pain in a major ambulatory surgery unit

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Abstract

A retrospective study to evaluate a clinical guide for the treatment of postoperative pain in our One Day Surgery Unit (ODSU) is presented. A total of 2783 patients, treated during 1 year, were studied. Postoperative pain was evaluated 24 h after surgery by phone-call using a visual analogue scale (VAS) and a verbal response scale (VRS). Results were analysed by groups of analgesia and pain scale values. Admissions due to insufficient analgesia were also evaluated. Mean values obtained in all analgesic groups in relation to the VAS were lower than 2.5. It was found that 86% of patients presented a value of VAS < 3, while 84.6% had a VRS value 2. Only two patients were admitted for uncontrolled postoperative pain. The level of postoperative analgesia in our patients was satisfactory. Despite this continuous evaluation of the clinical guides for the treatment of postoperative pain, the use of new powerful analgesic drugs is necessary because the surgical complexity in ODSU is increasing and patients with associated diseases are increasingly accepted.

Keywords: Postoperative analgesia; Ambulatory surgery; Visual analogue scale; Verbal response scale

1. Introduction

The existence of a clinical guide for the treatment of postoperative pain was considered essential since the inception of our One Day Surgery Unit (ODSU). Following the criteria of Chung [1] and Beauregard [2], the clinical guide for the treatment of postoperative pain was reviewed. Therapeutic groups were modified according to surgical procedures in order to avoid clinical variability, to evaluate the effectiveness of the clinical guide itself and to modify each therapeutic group if necessary. In this way, postoperative analgesia can be controlled [3], mean stay in the ODSU should be decreased and admissions due to uncontrolled postoperative pain avoided [4,5].

To evaluate the effectiveness of our clinical guide, we have reviewed the results obtained during 1998 in relation to the control of postoperative pain in the patients treated in the ODSU.

2. Patients and method

A retrospective evaluation of all patients operated in our ODSU was undertaken. Two thousand seven hundred and eighty-three patients among a total of 3830 treated (72.6%) were considered for the study (patients operated under local anaesthesia and patients operated for cataracts were both excluded). Two thousand four hundred and fifty-two patients were adults (over 14 years) and 331 were children (under 14 years). The mean age in adults was 50.6 and 5.7 in paediatric patients.

All the patients were treated with the same analgesic drugs and doses, according to our clinical guide. Depending on the surgical procedure, adult patients were divided into four groups, each group was divided again in two considering the presence of gastroduodenal peptic disease. Paediatric patients were divided in two groups depending on the surgical procedure. Diazepam 5–10 mg postoperative was administered to the adult patients on the night before surgery while ranitidin 150 mg postoperative bid was given to patients over 65

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Table 1

Groups	Analgesia	Surgical procedures
1A	Diclofenac 50 mg/8 h	Arthroscopy, hands and fingers surgical
1B (peptic ulcer disease)	Metamizol 1150 mg/8 h	Diathermia cervix
2A	Diclofenac 50 mg/8 h, Paracetamol 500 mg/8 h	Foot, varicose, groin hernia, sinus, anal fistula
2B (peptic ulcer disease)	Metamizol 1150mg/8 h, Paracetamol 500 mg/8 h	Ligature, minor plastic surgery
3A	Diclofenac 50 mg/8 h, Paracetamol-codein 2 cap/8 h	Breast surgery, bilateral groin hernia
3B (peptic ulcer disease)	Metamizol 1150 mg/8 h Paracetamol-codein 2 cap/8 h	
4	Paracetamol 500 mg/6 h	Cataracts
P1 (Paediatrics)	Paracetamol jbe 60 mg/Kg per day)	Estrabism, groin hernia, E.N.T. surgery
P2 (Paediatrics)	Ibuprofen jbe (20 mg/Kg per day)	Phimosis

years or those with a previously known gastroduodenal peptic ulcer disease. Table 1 shows the therapeutic groups in relation to surgical procedures.

Evaluation of postoperative pain was undertaken by a phone call 24 h postoperatively using a visual analogic scale (VAS, range 1–10) and a verbal response scale (VRS) of Keele [6]. Both scales were shown to the patients before discharge. Admissions for uncontrolled postoperative pain were noted.

3. Results

Fig. 1 shows mean values of VAS in each group of treatment. Patients treated with metamizol (1B, 2B, 3B) expressed mean values over patients treated with diclofenac (1A, 2A, 3A). Paediatric patients had mean values under 1.5 in both groups.

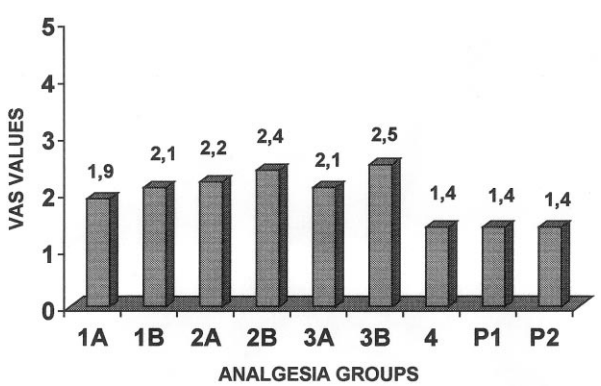

Fig. 1. Mean values of VAS in each analgesia group.

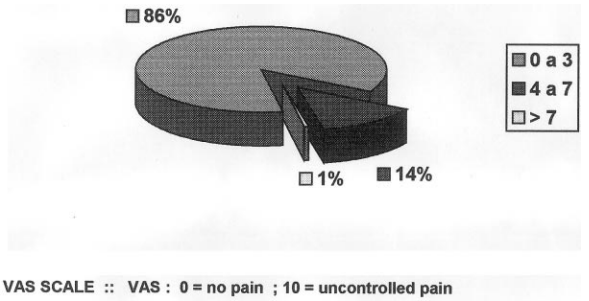

Fig. 2. Global VAS values. Vas scale — VAS, 0, no pain; 10, uncontrolled pain.

Fig. 2 show the global VAS values for all patients distributed in three groups to make a comparison with VRS categories in Fig. 3.

We had only two admissions for uncontrolled postoperative pain. One patient was a 46-year-old woman ASA I in whom a knee arthroscopy was undertaken under general anaesthesia. The other was a 45-year-old man ASA I operated for a groin hernia under spinal anaesthesia. In these cases, neither intra-articular nor local anaesthesia was used.

4. Conclusions

The existence of a protocol for the treatment of postoperative pain based on grouping therapeutics procedures according to surgery has been useful in decreasing clinical variability in postoperative analgesia. The decrease of clinical variability has allowed a continuous evaluation of analgesia effectiveness, as Beauregard postulated [2].

In spite of a low degree of difference, the groups treated with metamizol magnesium had higher levels of VAS when compared with those treated with diclofe

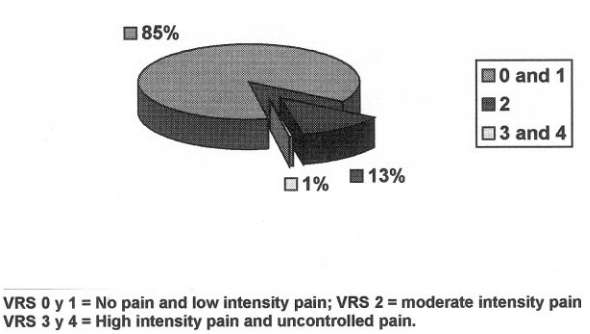

Fig. 3. VRS values. VRS 0 y 1, no pain and low intensity pain; VRS 2, moderate intensity pain; VRS 3 y 4, high-intensity and uncontrolled pain.

nac. This fact has been pointed out by other authors [7,8], but we think that new clinical trials are needed.

The positive effect of local infiltration for the treatment of postoperative pain [9] has been clearly confirmed. The two patients admitted for uncontrolled postoperative pain, a groin hernia repair and an arthroscopy were not submitted to local infiltration of the surgical wound and intra-articular infiltration, respectively.

The level of postoperative analgesia obtained in this study could be considered satisfactory. No group of analgesia showed a mean VAS level under 2.5 [2] and the admissions for uncontrolled pain were very low [3].

Increasing surgical complexity and future changes, including admitting to the day surgery programs patients with more associated diseases, will oblige us to make systematic reviews of protocols for the treatment of postoperative pain and to use more powerful analgesic drugs [10].

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References

[1] Chung F, Ritchie E, Su J. Postoperative pain in ambulatory surgery. Anesth Anal 1997;85(4):808–16.
[2] Beauregard L, Pomp A, Choinière M. Severity and impact of pain after day surgery. Can J Anaesth 1998;45(4):304–11.
[3] Tong D, Chung F. Postoperative pain control in ambulatory surgery. Surg Clin North Am 1999;79(2):401–30.
[4] Chung F, Mezei G. Factors contributing to a prolonged stay after ambulatory surgery. Anesth Analg 1999;86(6):1352–9.
[5] Pavlin DJ, Rapp SE, Polissar NL, Malmgren JA, Koerschgen M, Keyes H. Factors affecting discharge time in adults outpatients. Anesth Analg 1998;87(4):816–26.
[6] Muriel C, Madrid JL. Estudio y Tratamiento del Dolor Agudo y Crónico. Madrid: ELA, 1995:50.
[7] Hovorka J, Kallela H, Korttila K. Effect of intravenous diclofenac on pain and recovery profile after day-case laparoscopy. Eur J Anaesthesiol 1993;10(2):105–8.
[8] Laitinen J, Nuutinen L, Kiiskila EL, Freudenthal Y, Ranta P, Karvonen J. Comparison of intravenous diclofenac, indomethacin and oxycodone as postoperative analgesics in patients undergoing knee surgery. Eur J Anestesiol 1992;9(1):29–34.
[9] Cook TM, Tuckey JP, Nolan JP. Analgesia after day-case knee arthroscopy: double blind study of intra-articular tenoxicam, intra-articular bupivacaine and placebo. Br J Anaesth 1997;78(2):162–8.
[10] Broome IJ, Robb HM, Raj N, Girgis Y, Wardall GJ. The use of tramadol following day-case oral surgery. Anaesthesia 1999;54(3):289–92.

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Constructing information booklets for day-case patients

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Abstract

As modern surgical and anaesthetic techniques develop even greater capabilities, the time in which to adequately undertake such nurse/patient discussions has past and will never return. Information provision is thus a challenge for day surgery. Many studies have suggested patients require differing levels of information i.e. full, partial and minimal disclosure. Future information booklets may need to be constructed in a more patient centred manner. This article attempts to provide a methodical approach to the required level of information, a guide to the construction of information booklets and suggestions for their application in day surgery.

Keywords: Day surgery; Empowerment; Levels of information disclosure; Booklet design

1. Introduction

Classical studies over two decades, ago associated pre-operative nursing intervention with the copious provision of procedural, behavioural and sensory information. [1–7] The public's preference for day surgery, the lack of time to ask questions, the added emphasis on medical fitness, rapid post-operative recovery and home convalescence have all contributed to one of the most pressing challenges currently facing day surgery – information provision [8,9]. This is supported by the Audit Commission [10] who state one of the main complaints within day surgery to be the lack of information, especially written information. The Royal College of Surgeons of England and East Anglia R.H.A. [11] conducted a comprehensive study in which data were collected from 10 day surgery units, 30 consultant surgeons and 1434 patients. Patients voiced many concerns, but pre-operative information provision was the greatest. Lindén and Engberg [12] surveyed 105 patients undergoing a variety of day surgery procedures and concluded 36% were dissatisfied with the information they received. Furthermore, dissatisfaction with information was associated with increased post-operative morbidity. In a study by Pollock and Trendholm [13] 110 days surgery patients were interviewed and information provision was again a noteworthy source of criticism. Menon [14] interviewed 78 days surgery patients to discover 66% required more information: being provided with adequate information at all stages of their care was associated with rating the day surgery unit as excellent or good. Leinonen and Leino-Kilpi [15] in a review of the literature on peri-operative care (pre-, intra- and post-operative care) highlighted information provision as a considerable challenge for both inpatient and day patient surgery.

It must be clearly emphasised that information provision alone is insufficient for the effective psychological preparation of patients undergoing day surgery [16–18]. Information must be provided within a formalised framework of care and delivered in a structured manner. Only the specific elements relating to the quality of information booklets will be examined here. The complete pre-operative psychological preparation of patients for day surgery has been reported elsewhere [17] (Table 1). Concerning information provision, what is clearly required is a closer examination of the required level of information, a systematic method of constructing information booklets and advice on how such booklets can be best employed in day surgery.

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2. Level of information disclosure

One of the main obstacles to adequate information provision has been the lack of guidance as to the most effective method of conveying the necessary information. Numerous reviews have established differing types of information provision to be most effective [5–7,19,20], (Table 2). This disagreement has resulted in a stalemate and the consequent absence of any formal pre-operative anxiety management plan. In less contentious areas of nursing care formalised plans are commonplace. For example, the physical nursing intervention required by a breathless, unconscious or immobile patient has been well documented, has broad professional agreement and exists in formal programmes of care for easy replication [21–23]. The lack of explicit pre-operative psychological programmes of care is evident in a number of recent nursing texts concerning day surgery [24–26]. These texts deal briefly with the nurses' role in anxiety management although put forward little practical advice. Traditionally, pre-operative psychological nursing care has been solely associated with the provision of information and this continues to be the case today. Information is deemed to be the essential ingredient in helping a patient understand what is to happen and what is required of them. The implicit message being

Information provision = reduced anxiety.

Furthermore, mere information provision is frequently given the nonsensical label of 'reassurance' [27]. No one can fully gauge whether information alone has truly helped to reduce anxiety in the short time periods associated with day surgery [16]. Anxiety may begin many days or hours before the actual day of surgery yet only be adequately addressed a matter of hours or minutes prior to surgery [28–31].

Change is required as many studies have evaluated present pre-operative psychological management within modern surgery as outdated and unsatisfactory i.e. limited contact with hospital personal, rapid patient throughput, brief hospital stay [32–36]. A considerable number of studies have suggested a way forward would be to provide differing levels of information to match the patients preferred coping style i.e. vigilant and avoidant coping [4,36–46].

A vigilant coping style is distinguished by an approach to and an intensified processing of, threatening information. Its purpose is to help gain control over the main threat-related aspects of a situation thereby protecting the individual from the perception of unexpected dangers i.e. nothing surprises them as they are already aware of all the pertinent issues [47]. Mogg et al. [48] stated anxiety-prone individuals in acutely stressful situations may very easily activate their perception of threat relevant cues e.g. vigilant copers go into 'cognitive overdrive' in a stressful situation, extracting information from their environment and processing it constantly as negative or threatening (Table 3).

Cognitive avoidance is a withdrawal from threat-relevant information. Its purpose is to reduce the anxiety caused by the confrontation with a potentially frightening event [47]. Hock et al. [49] stated cognitive avoiders process far less threatening information than vigilant copers. This was viewed as advantageous in a dental surgery study by Baume et al. [50] as the patient was assessed as being less anxious during the actual procedure. Other studies have postulated avoidant behaviour to be a disadvantage in the long term as all too frequently healthcare matters requiring continued attention may be ignored [51–53]. Fluctuating copers are people who generally fall between these two extremes and commonly require a small amount of information although in some areas more detailed information e.g. more information regarding general anaesthesia as this has repeatedly been demonstrated as the most anxiety

Table 1
Main themes of anxiety management [17]

Intervention	Rationale
Provision of differing levels of information	Too little information for the patient who desires a great deal can increase anxiety. Conversely, too much information for the patient who desires very little can also increase anxiety
Promoting cognitive coping strategies	Constantly dwelling on the negative aspects of proposed anaesthesia and/or surgical treatment can give a false impression of safety
Therapeutic use of self	The close physical presence of the nurse is one of the most effective methods of anxiety management
Providing a semblance of control	Some patients desire more control over events than others. Therefore in a healthcare situation where the opportunity for such personal inclusion is often minimal, direct action is necessary
Promoting positive self-efficacy appraisals	Some patients feel less able to cope with a surgical event than others. Encouragement in self belief is therefore necessary especially when much recovery occurs at home
Persuasive environmental appraisals	Positive implicit and explicit environmental appraisals can have an advantageous effect upon the patients' perception of safety

Table 2
Types of pre-operative information [103]

Pre-operative information provision
Procedural information The sequential order of events on the day of surgery i.e. what will happen next and in what order they will happen
Behavioural information The behaviour[s] or action[s] the patient is required to undertake either before, during or after the surgical procedure i.e. adopting a certain position for the surgical procedure, deep breathing exercises, no lifting for 6 weeks, keeping the limb elevated, gentle movements only, etc.
Sensory information The bodily sensations the patient is likely to experience either before, during or after the surgical procedure i.e. the likely sensations of the drugs entering the body during the initial stages of anaesthesia, degree and duration of pain, etc.
Cognitive coping strategies The positive thoughts a patient can draw upon in order to gain assurance they will be safe, awake from their operation, be unharmed and gain a full recovery i.e. being told of the highly trained staff, effective drugs, modern well maintained equipment, many safe operations performed, etc.
Relaxation Individual strategies of relaxation or a planned programme of relaxation techniques, music therapy, hypnosis, other simple methods of distraction, etc.
Modelling Directly by actively copying the required or desired behaviour or by indirectly copying i.e. quietly watching and copying the required or desired behaviour. This could be via a real-life event, a relative or friend, the media or a video/audio-tape programme or leaflet produced by the hospital, etc.

provoking aspect of surgery [54–57]. All that is required to determine an individuals' coping style is the availability of choice i.e. offering an information package of full, partial or minimal disclosure [35,36].

3. Construction of information booklets

3.1. Ethos

In a comprehensive review of the literature by Webber [58] on patient education three main barriers to effective communication were identified (i) lack of co-ordination of the educators i.e. who's role, where and when; (ii) education of hospital personnel in the formation and distribution of educational material; and (iii) the low priority given to education by administrators. Webber [58] questioned the fundamental motive of patient education i.e. to empower the patient or to gain compliance. Following an in-depth interview of 30 surgical patients Meredith [59] suggested information should be provided in such a way as to help 'prime' patients to be able to ask for the information they required. For example, Pollock and Trendholm [13] reported 33% of patients would have preferred to meet their anaesthetist prior to surgery but did not.

Law [60] following a telephone survey of 45 ophthalmic day-surgery patients concluded more emphasis should be placed upon consumer choice and the Audit Commission [61] recommended patients should receive good written information about each stage of their treatment. Redman [62] in a review of 25 years of patient education stated 'Informed consent should be seen as a minimum requirement. The real goal is discovery of what fits best the unique experienced needs and aspirations of a particular person, working through shared decision making'. (p. 728). Following an examination of 184 information leaflets from 97 hospitals concerning hysterectomy it was stated patient educational material should be both informative and empowering [63]. This theme of empowerment is also echoed by Malin and Teasdale [64] who state 'Empowerment implies that the nurse must maximise patients' independence and minimise their dependence' (p. 658). As the majority of recovery from day surgery occurs at home this may need to become an implicit part of all day surgery information.

Kaufmann [65] in an American literature review on informed consent and patient decision making between 1960 and 1980 concluded patients were able to make decisions when the information was understandable. Mumford [66] examined 24 leaflets from differing specialties and also recommended the use of simple language. Following a survey of day surgery patients De Jesus et al. [67] stated '…the single most common suggestion from surveyed patients on how to improve same day surgery services is to cater for possible complications through provision of clear and specific information' (p. 171). The well-known day surgery guidelines by the Royal College of Surgeons [68] also suggests information should be written in local language and translated for ethnic groups. In a survey of 317 patients undergoing a variety of day surgery procedures 19% felt they were given conflicting advice [69].

The N.H.S. Management Executive [70] stated all information must be consistent. Otte [71] reiterated this when highlighting the difficulties caused when contradictory advice was given.

In a review of information provision the readability of leaflets was identified as a problematic area [72]. The study recommended a reading age of 12 years to be most appropriate for all leaflets. Furthermore, educational material should try to lead with a question i.e. 'What do I have to do?' etc. This simple 'questions answered' theme by Kent [72] will be utilised here together with the logical sequence of leaflet construction outlined by the Audit Commission (1990 p. 43–44) [61] i.e. Phase I, before admission; Phase II, on admission and Phase III, on discharge, in order to established a framework for future day surgery booklet construction (Table 4). However, any blueprint for an information booklet design will require rigorous patient and multi-disciplinary evaluation prior to its use. Additionally, local variations in practice may necessitate slight adaptation.

3.2. Phase I, before admission

During the pre-assessment visit, following medical suitability issues, the patient can choose the most appropriate level of information with the nurse i.e. a package of information containing full, partial or minimal disclosure. This provides the opportunity for questions and the chance for the nurse to reiterate some crucial points. For example, in a study by Zvara et al. [73] it was discovered approximately 50% of patients did not know when to stop eating and drinking prior to admission. Hawkshaw [74] suggested emphasising some helpful aspects e.g. the need for loose fitting trousers on the day of surgery when undergoing knee arthroscopy. Some patients may also like to look around the surgical unit to familiarise themselves with their future surroundings [75]. Yount and Schoessler [76] suggest skills teaching should take place at this point prior to surgery i.e. post-operative exercises, ways of dealing with pain, possible sensations following surgery/anaesthesia. Psycho-social support would then largely be the focus of care on the day of admission i.e.

Pre-assessment clinic

1. Main emphasis 'informing' i.e. procedural (order of events), behavioural (skills teaching), sensory information (likely sensations), etc.
2. To a lesser extent 'supporting'.

Admission day

1. Main emphasis 'supporting' i.e. psychological care (formal programme) social support (relatives), etc.
2. To a lesser extent 'informing'.

In a review of the psychological factors affecting recovery from surgery it was reported the need for information pre-operatively was to help reduce anxiety and reassure patients [77]. Reid [78] questioned 15 members of staff in day surgery about the information they provided and again the main purpose of information was to reduce anxiety and increase patient appraisals of control. Lancaster [79] suggested patient education was one of the primary roles of the peri-operative nurse and as the amount of day surgery expands and patient requirements grow several studies have also recommended day surgery patients should receive an increased level of information [11,80–83].

The information provided prior to surgery must cover the whole range of procedural, behavioural and sensory information plus cognitive coping strategies and relaxation advice where applicable [17] (Table 1). An explanation of the planned surgery and anaesthesia must be discussed to the requested level of disclosure and the relevant written information provided.

3.3. Phase II, on admission

As previously stated in a study by Yount and Schoessler [76] 116 patients admitted on the morning of surgery were surveyed and it was concluded psycho-social support should be the main emphasis on the day of surgery. Menon [14] reported the long waiting period on the day to be a main source of complaint. Buttery et al. [84] recommended the possible reasons for any delay on the day of surgery should be included in all information leaflets. Procedural, behavioural and sensory information should be provided briefly although the main focus at this point should involve the repetition and reinforcement of available cognitive coping strategies. As stated earlier, information provision should be part

Table 3
Innate coping styles [8]

Vigilant coper	Patients with this coping style should receive copious amounts of information as too little makes them more anxious. Full disclosure of information therefore recommended.
Fluctuating coper	Patients with this coping style should generally receive a small amount of information as too much may make them anxious. However, in certain areas they will desire greater detail i.e. proposed surgery. Minimal plus selected areas of disclosure therefore recommended.
Avoidant coper	Patients with this coping style should receive a small amount of information as too much makes them more anxious. Minimal disclosure of information therefore recommended.

Table 4
Framework for information booklet construction (examples not exhaustive)

Booklet construction framework
Phase I
What is day surgery?
Example – Modern surgical and anaesthetic practice, minimal access surgery, intermediate surgery, reduced waiting list time, one morning or afternoon in hospital, recovery at home, safe, etc.
What do I need to know about the day surgery unit?
Example—Location, parking, telephone number, arrival and approximate discharge times, where to go on arrival, arrangements for relative/friend, identification of staff, brief definition of staff roles in the day surgery unit, etc.
What operation will I have?
Example—Vigilant coper a full account of procedural, behavioural and sensory information with diagrams, a chance to visit the unit, full written information, take-home video, etc. Fluctuating coper a partial account of procedural, behavioural and sensory information, written information with requested additional elements e.g. fear of surgery or its potential outcome. Avoidant coper a simplified account, written information, emphasis on relaxation, etc.
What type of anaesthetic will I have?
Example—Vigilant coper a full account of procedural, behavioural and sensory information with diagrams, etc. Fluctuating coper a partial account with requested additional elements e.g. fear of anaesthesia. Avoidant coper a simplified account, emphasis on relaxation, etc.
What are the benefits of having this surgical procedure?
Example—Avoidance of future complications, improved health status, patient request, specific issues, etc.
Why is a pre-assessment visit required?
Example—Medical suitability, social circumstances, information provision, recovery advice, anxiety management, etc.
What arrangements should I make before the day of surgery?
Example—Transport to and from the unit, relative/carer to accompany, 24 h post-operative care by adult, plan adequate convalescence period, social and employment arrangements, pain management provision, wound management advice, specific issues, etc.
What do I need to do before I arrive at the hospital on the day of surgery?
Example—Nil-by-mouth, suitable clothing, what to bring and what not to bring, medication, relative/carer, arrival and approximate discharge time, special instructions, etc.
Phase II
What will happen to me once I arrive at the hospital on the day of surgery?
Example—Briefly reiterate procedural, behavioural and sensory information although concentrating mainly on psycho-social aspects of care i.e. cognitive coping strategies, carer information/advice, social arrangements, etc.
If I am anxious how will I be helped?
Example—Full implementation of anxiety management care plan [17]
Who are the people caring for me and when will I meet them to discuss my care?
Example—Introduce self, other staff, surgeons and anaesthetist, time for brief discussions, etc.
How will my carer be kept informed of my progress and eventual discharge?
Example—Carer to remain with patient, telephone contact, pre-arranged telephone call, special arrangements, etc.
What will happen after my operation before my discharge home?
Example—Recovery room, ward recovery, warning of possible use of medical equipment (intravenous infusion, cannula, etc.), analgesia, anti-emetics, medications, wound management advice, medical certificate, specific instructions, etc. Recovery room, ward recovery, warning of possible use of medical equipment (intravenous infusion, cannula, etc.), analgesia, anti-emetics, medications, wound management advice, medical certificate, specific instructions, etc.
Phase III
On discharge home from the hospital what should I do?
Example—Go home immediately, rest, take recommended medications i.e. analgesia, antibiotics, etc., allow time for convalescence, manage wound as advised, specific instruction, etc.
If I experience any pain how will I reduce it?
Example—Some pain and discomfort is expected, rest completely for the first 24–48 h, avoid sudden or excessive movement for the first 24–48 h, take recommended analgesia exactly as advised for at least the first 24–48 h, etc.
What side–effects may occur at home and how can I recognise them?
Example—Excessive pain, tiredness, nausea, wound problems, sore throat, fatigue, specific issues, etc.
What support will I have at home?
Example—Adult carer main support for a minimum of 24 h, helpline telephone number, 24 nurse initiated telephone call, general practitioner, district nurse, 6 week hospital appointment, specific issues, etc.
How will the operation affect my normal lifestyle?
Example—Brief advice on returning to normal i.e. sleeping, eating and drinking, bathing, mobility level, returning to work, stretching, advice on sexual matters, bowel and bladder function, housework, lifting, driving, exercise and sport, weight loss/gain, specific issues, etc.
Who can I contact for more advice or the early results of my surgery?
Example—Day surgery telephone number, general practitioner, district nurse, early hospital appointment, special arrangements, etc.
Where can I obtain more information about my surgery?
Example—Day surgery unit, consultant, general practitioner, district nurse, bads website, etc.
What are the possible complications of this type of surgery?
Example—Degree, duration and possible sites of pain, nausea, wound infection or poor healing, usual and unusual events plus how to recognise them as such, possible sensations, specific events, etc.
NB: This section should be brief for minimal disclosure leaflet (avoidant coper) as it may result in more anxiety if read. Indeed, it is extremely unlikely this section will be read pre-operatively by a patient with an avoidant coping style. However, they may utilise some of this information in the post-operative period.

of a formal anxiety management plan and all aspects of the plan must be fully utilised at this most stressful stage [16–18,27,54,56,57], (Table 1).

A number of studies have identified the lack of knowledge regarding the role and qualifications of the anaesthetist [57,85,86]. Meeting the anaesthetist has been seen to help aid anxiety management and provide the opportunity to gain answers to frequently asked questions e.g. does induction of anaesthesia involve a mask or needle and how long will the anaesthetic last [36,87].

In an audit of the carers' views the main complaints were stated as lack of parking space, quality of written information and information regarding medications [88]. A number of studies have also recommend a relative/friend should be present prior to discharge during the giving of information [20,89,90]. Pollock and Trendholm [13] stated 40% of patients left hospital with no feedback concerning the outcome of their surgery although this may be due, in part, to the patient forgetting the information [91].

3.4. Phase III, on discharge

Bostrom et al. [92] reported the first two weeks following discharge were viewed as the most important as patients were often striving to regain autonomy in their health care. Indeed, this aspect of 'returning to normal' is the largest theme within the literature on recovery at home following day surgery together with pain management, sleep disturbance and nausea [93] (Table 2). Many studies uncovered the patients' desire to be informed of possible complications in the post-operative period and also how such complications can be recognised [67,86,91,92,94]. Donoghue et al. [95] interviewed 31 days surgery patients and 'Many of the participants reported that there were experiences they had not anticipated, surprises that they did not welcome and things that they would have liked to have known before the operation' (p. 173). The provision of information in this area may help to prevent issues of 'trial and error' recovery [96].

The Royal College of Surgeons of England and East Anglia Regional Health Authority [11] sent a postal questionnaire to 550 days surgery patients to enquire about their experiences. The main problems were sleep disturbance, asking for help, wound care, mobility, returning to work and nausea. In one day surgery study the most common problem at home was pain (42%), sleep (15%) and nausea (11%) [97]. Some patients wanted information regarding the safe time to resume activities, warning of the possible problems and what to regard as 'normal or unusual' in the post-operative period [97]. Bradshaw et al. [98] examined the whole issue of information provision and recommended improved leaflet evaluation. A guide to the main patient requirements was also developed and included post-operative pain management, common wound problems, aspects of bathing, stretching and heavy exercise, return to work, driving and advice on sexual matters.

Bostrom et al. [91] interviewed 1400 patients in a telephone follow-up after day surgery and over 90% of patients had questions about self-care and recovery at home. The interviews also revealed written information provided by the nurses prior to discharge had either been forgotten or mis-understood. The main questions asked by the patients related to when to eat, when the hospital follow-up appointment would be and who would see them, possible complications and their recognition, return of normal bowel function, pain management and how to rest. In an Australian survey 40 patients were asked on the eve of surgery to rank 13 categories of information into the most preferred order [86]. When they were able to eat following surgery, when they were able to get out of bed and the common complications were all rated as most desirable.

Woodhouse et al. [99] audited 268 patients who had undergone a variety of day surgery procedures to evaluate the level of community healthcare involvement. Common reasons for visiting their general practitioner were for medical certificates, discussion on return to work and wound care. The study recommended encouraging patients to use the day surgery telephone helpline, providing clear instructions on discharge regarding returning to work and the provision of medical certificates in order to combat any increased use of community healthcare facilities. MacAndie and Bingham [100] also examined the impact of day surgery on general practitioner workload and recommended improving information provision, analgesia provision and the distribution of sick leave certificates. In interviews of 252 carers of day surgery patients 90% were concerned with the patients' pain, wound care, sleep disturbance and nausea [101]. A leaflet especially constructed for carers was recommended.

4. Application to day surgery

The implementation of such a system, although ambitious, would result in major improvements to information provision within day surgery. A number of issues may present a challenge i.e. new nursing role, staff training, financial and legal implications. The implementation of a formal system of information can be provided within an explicit psychological programme of care, as reported elsewhere [17,18]. This will consist of a nursing role dedicated to the supervision and maintenance of day surgery information provision. While this new nursing role would involve the co-ordination of a formal pre-operative psychological programme of care it would need to be adopted and implemented by all

Table 5
Clinical negligence scheme for trusts – Standard No. 7 [103]

Information on the risks and benefits of proposed treatment or investigation	
7.1.1	There is patient information available showing the risks/benefits of 10 common elective treatments.
7.1.2	All consent forms used comply with N.H.S.E. Guidelines for design and use.
7.2.1	There is patient information available showing the risks/benefits of 20 common elective treatments.
7.2.2	There is a policy/guideline stating that consent for elective procedures is to be obtained by a person capable of performing the procedure.
7.3.1	There is a clear mechanism for patients to obtain additional information about their condition.

day surgery personnel. It would require a degree of staff training and gradual introduction i.e. one surgical procedure or surgical speciality at a time.

The financial implications may be somewhat prohibitive in the production of quality information encompassing all day surgery techniques especially concerning the production of full and minimal disclosure booklets. However, this may be less of a problem in the future if information resources can be centralised on the British Association of Day Surgery website (bads@bads.co.uk), the International Association for Ambulatory Surgery website www.iaas-med.org or other similar websites in America, Australia, Europe, etc. Day surgery units could be invited to produce (and periodically update) a full and minimal disclosure leaflet on a given surgical procedure within the 'Trolley of Procedures' [102]. The design outlined here could be employed for all procedures following its detailed patient and multi-disciplinary evaluation (Table 4). It may then be possible to make all surgical procedures within the Trolley of Procedures available on a website for use when and where applicable by downloading the required information or by merely viewing the desired information directly with the patient in the pre-assessment clinic. Local practices could be added or subtracted wherever deemed necessary. If the patient has access to an Internet facility he/she can be given the website address to go home and pursue the information for themselves. This centralisation of information may also have the added value of spreading best practice and ultimately be a source of reference for any day surgery patient, general practitioner or district nurse who requires information. It could also become a useful teaching aid for both medical and nursing students.

Legal implications dictate patients must receive some information regarding the possible risks and benefits of their planned surgery depending upon the level of legal cover required. In a review of the Clinical Negligence Scheme for Trusts one legal standard (No. 7) specifically relates to information provision [103] (Table 5). This standard stipulates 'There is patient information available showing the risks/benefits of 20 common elective treatments' (p. 41). If all information was constructed and disseminated in the manner outlined here it would be legally acceptable as the risks and benefits of surgery would be available for the Trolley of Procedures i.e. approximately 250 surgical procedures.

5. Conclusion

A solution to the issues of information provision in day surgery must be pursued as a number of challenging aspects persist. The main problems relate to the level of information as some patients require more while others less. If a choice of information was to be made accessible, patients could decide which level was the most appropriate for them. Written information on two levels — full and minimal disclosure, could be made available centrally on the British Association of Day Surgery and the International Association for Ambulatory Surgery websites. A useful approach to the design of information is to provide a 'questions answered' format which encompasses all three phases of day surgery i.e. pre-operative, day of surgery and post-operative information. The required level of information could be downloaded with the nurse in the pre-assessment clinic or viewed on a personal basis. A central dissemination point may also help to spread best practice and provide a point of reference for any interested party. This method of information leaflet construction will, require full patient and multi-disciplinary evaluation prior to any implementation.

References

[1] Volicer BJ. Perceived stress levels of events associated with the experience of hospitalisation: development and testing of a measurement tool. Nursing Res 1973;22(6):491–7.
[2] Hayward, J. Information – a prescription against pain, (series 2), vol. 5. London: Royal College of Nursing, 1995.
[3] Boore JRP. Prescription for recovery. London: Royal College of Nursing, 1978.
[4] Wilson JF. Behavioural preparation for surgery: benefit or harm? J Behav Med 1981;4(1):79–102.
[5] Mathews A, Ridgeway V. Psychological preparation for surgery. In: Steptoe A, Mathews A, editors. Health care and human behaviour. London: Harcourt Brace Jovanovch, 1984:231.
[6] Suls J, Wan CK. Effects of sensory and procedural information on coping with stressful medical procedures and pain: a meta analysis. J Consul Clin Psychol 1989;57(3):372–9.
[7] Johnston M, Vogele C. Benefits of psychological preparation for surgery: a meta analysis. Ann Behav Med 1993;15(4):245–56.
[8] Mitchell MJ. Patient's perceptions of day surgery: a literature review. Ambul Surg 1999;7(2):65–73.

[9] Mitchell MJ. Summary of studies into adult patient's perceptions of day surgery. Ambul Surg 1999;7(2):75–100.
[10] Audit Commission for Local Authorities and the National Health Service in England and Wales. Measuring quality: the patient's view of day surgery, vol. 3. London: HMSO, 1991.
[11] Royal College of Surgeons of England and East Anglia Regional Health Authority, New Angles on Day Surgery. NHS Executive: East Anglian Regional Clinical Audit Office, 1995.
[12] Lindén I, Engberg IB. Patients' opinions and experiences of ambulatory surgery. Ambul Surg 1995;3(3):131–9.
[13] Pollock I, Trendholm J. All in a day's work. Which?: The Independent Consumer Guide, February 1997; pp. 14–17.
[14] Menon NK. Patient satisfaction with direct access vasectomy service. Br J Family Plann 1998;24(3):105–6.
[15] Leinonen T, Leino-Kilpi H. Review: research in peri-operative nursing care. J Clin Nursing 1999;8(2):123–38.
[16] Teasdale K. Information and anxiety: a critical reappraisal. J Adv Nursing 1993;18(7):1125–32.
[17] Mitchell MJ. Anxiety management: a distinct nursing role in day surgery. Ambul Surg 2000;8(3):119–28.
[18] Mitchell MJ. Nursing intervention for pre-operative anxiety management. Nursing Standard 2000;14(37):40–3.
[19] Miller SM, Combs C, Stoddard E. Information, coping and control in patients undergoing surgery and stressful medical procedures. In: Steptoe A, Appels A, editors. Personal control and health. Chichester: Wiley, 1989:107.
[20] Rothrock JC. Peri-operative nursing research. Part I: Pre-operative psycho-educational interventions. Assoc Oper Room Nursing J 1989;49(2):597–619.
[21] Alexander MF, Fawcett JN, Runciman PJ. Nursing practice-hospital and home: the adult patient. London: Churchill Livingstone, 1994.
[22] Mallet J, Bailey C. The royal marsden NHS trust manual of clinical nursing procedures. London: Blackwell, 1996.
[23] Nettina SN. Lippincott manual of nursing practice, 6th ed. Philadelphia: Lippincott, 1996.
[24] Meeker MH, Rothrock JC. Alexander's care of the patient in surgery, 11th ed. London: Mosby, 1999.
[25] Malster M, Parry A. Day surgery. In: Manley K, Bellman L, editors. Surgical practice-advancing practice. London: Churchill Livingston, 2000:286.
[26] Davies R. Psychological, existential and spiritual aspects of surgery. In: Manley K, Bellman L, editors. Surgical practice-advancing practice. London: Churchill Livingston, 2000:168.
[27] Teasdale K. The concept of reassurance in nursing. J Adv Nursing 1989;14(6):444–50.
[28] Christopherson B, Pfeiffer C. Varying the timing of information to alter pre-operative anxiety and post-operative recovery in cardiac surgery patients. Heart and Lung 1980;9(5):854–61.
[29] Lepczyk M, Raleigh EH, Rowley C. Timing of pre-operative patient teaching. J Adv Nursing 1990;15(3):300–6.
[30] Mavrias R, Peck C, Coleman G. The timing of pre-operative preparatory information. Psychol Health 1990;5(1):39–45.
[31] Cupples SA. Effects of timing and reinforcement of pre-operative education on knowledge and recovery of patients having coronary artery bypass graft surgery. Heart and Lung 1991;20(6):654–60.
[32] Markanday L, Platzer H. Brief encounters. Nursing Times 1994;90(7):38–42.
[33] Murphy SJ. Pre-operative assessment for day surgery. Surg Nurse 1994;7(3):6–9.
[34] Fellowes H, Abbott D, Barton K, Burgess L, Clare A, Lucas B. Orthopaedic pre-admission assessment clinics. London: Royal College of Nursing, 1999.
[35] Mitchell MJ. Patients' perceptions of pre-operative preparation for day surgery. J Adv Nursing 1997;26(2):356–63.
[36] Mitchell MJ. Psychological preparation for patients undergoing day surgery. Ambul Surg 2000;8(1):19–29.
[37] Egbert LD, Battit GE, Welch CE, Bartlett MK. Reduction of post-operative pain by encouragement and instruction of patients. N Engl J Med 1964;270(16):825–7.
[38] Andrew JM. Recovery from surgery, with and without preparatory instruction for three coping styles. J Personality and Social Psychol 1970;15(3):223–6.
[39] Auerbach SM, Kendall PC, Cuttler HF, Levitt NR. Anxiety, locus of control, type of preparatory information and adjustment to dental surgery. J Clin Psychol 1976;44(5):809–18.
[40] Auerbach SM, Martelli MF, Mercuri LG. Anxiety, information, interpersonal impacts, and adjustment to a stressful health care situation. J Personality and Social Psychol 1983;44(6):1284–96.
[41] Shipley RH, Butt JH, Horwitz B, Farbry JE. Preparation for a stressful medical procedure: effect of amount of stimulus pre-exposure and coping style. J Consul Clin Psychol 1978;46(3):499–507.
[42] George JM, Scott DS, Turner SP, Gregg JM. The effects of psychological factors and physical trauma on recovery from oral surgery. J Behav Med 1980;3(3):291–310.
[43] Mumford E, Schlesinger HJ, Glass GV. The effects of psychological intervention on recovery from surgery and heart attacks: an analysis of the literature. Amer J Public Health 1982;72(2):141–51.
[44] Watkins LO, Weaver L, Odegaard V. Preparation for cardiac catheterisation: tailoring the content of instruction to coping style. Heart and Lung 1986;15(4):382–9.
[45] Miller SM. Monitoring and blunting: validation of a questionnaire to assess styles of information seeking under threat. J Personality and Social Psychol 1987;52(2):345–53.
[46] Royal College of Surgeons of England and Royal College of Psychiatrists, Report on the Working Party on the Psychological Care of Surgical Patients (CR55), London: RCS & RCP, 1997.
[47] Krohne HW. The concept of coping modes: relating cognitive person variables to actual coping behaviour. Adv Behav Res Therapy 1989;11(4):235–48.
[48] Mogg K, Mathews A, Bird C, MacGregor-Morris R. Effects of stress and anxiety on the processing of threat stimuli. J Personality and Social Psychol 1990;59(6):1230–7.
[49] Hock M, Krohne HW, Kaiser J. Coping dispositions and the processing of ambiguous stimuli. J Personality and Social Psychol 1996;70(5):1052–66.
[50] Baume RM, Croog SH, Nalbandian J. Pain perception, coping strategies, and stress management among periodontal patients with repeated surgeries. Perceptual and Motor Skills 1995;80(February):307–19.
[51] Mullen B, Suls J. The effectiveness of attention and rejection as coping styles: a meta-analysis of temporal differences. J Psychosomatic Res 1982;26(1):43–9.
[52] Suls J, Fletcher B. The relative efficacy of avoidant and non-avoidant coping strategies: a meta analysis. Health Psychol 1985;4(3):249–88.
[53] Kohlmann C-W, Weidner G, Messina CR. Avoidant coping style and verbal-cardiovascular response dissociation. Psychol Health 1996;11(3):371–84.
[54] Ramsay MAE. A survey of pre-operative fear. Anaesthesia 1972;27(4):396–402.
[55] Male CG. Anxiety in day surgery patients. Br J Anaesthesia 1981;53(6):663P.
[56] McCleane GJ, Cooper R. The nature of pre-operative anxiety. Anaesthesia 1990;45(2):153–5.
[57] McGaw CD, Hanna WJ. Knowledge and fears of anaesthesia and surgery: the Jamaican perspective. West Ind Med J 1998;47(2):64–7.

[58] Webber GC. Patient education: a review of the issues. Medical Care 1990;28(11, Part 2):1089–103.
[59] Meredith P. Patient satisfaction with communication in general surgery: problems of measurement and improvement. Social Sci Med 1993;37(5):591–602.
[60] Law M-L. A telephone survey of day-surgery eye patients. J Adv Nursing 1997;25(2):355–63.
[61] Audit Commission for Local Authorities and the National Health Service in England and Wales, A Short Cut To Better Services. Day Surgery in England and Wales, London: HMSO, 1990.
[62] Redman BK. Patient education at 25 years: where we have been and where we are going. J Adv Nursing 1993;18(5):725–30.
[63] Scriven A, Tucker C. The quality and management of written information presented to women undergoing hysterectomy. J Clin Nursing 1997;6(2):107–13.
[64] Malin N, Teasdale K. Caring versus empowerment: considerations for nursing practice. J Adv Nursing 1991;16(6):657–62.
[65] Kaufmann CL. Informed consent and patient decision making: two decades of research. Social Sci Med 1983;17(21):1657–64.
[66] Mumford ME. A descriptive study of the readability of patient information leaflets designed by nurses. J Adv Nursing 1997;26(5):985–91.
[67] De Jesus G, Abbotts S, Collins B, Burvill A. Same day surgery: results of a patient satisfaction survey. J Quality in Clin Practice 1996;16(3):165–73.
[68] Royal College of Surgeons of England, Guidelines for day case surgery, London: HMSO, 1992.
[69] Jennings BM, Sherman RA. Anxiety, locus of control, and satisfaction in patients undergoing ambulatory surgery. Military Med 1987;152(4):206–8.
[70] NHS Management Executive, Report by the Day Surgery Task Force, London: HMSO, 1993 (Updated in 1994).
[71] Otte DI. Patients' perspectives and experiences of day surgery. J Adv Nursing 1996;23(6):1228–37.
[72] Kent G. Shared understandings for informed consent: the relevance of psychological research on the provision of information. Social Sci Med 1996;43(10):1517–23.
[73] Zvara DA, Mathes DD, Brooker RF, McKinley AC. Video as a patient teaching tool: does it add to the pre-operative anesthetic visit? Anesthesia Analgesia 1996;82:1065–8.
[74] Hawkshaw D. A day surgery patient telephone follow-up survey. Br J Nursing 1994;3(7):348–50.
[75] Heinen C, Melodie P. "Operation Information" for ambulatory surgical patients. Nursing Manage (USA) 1992;23(8):64Q–T.
[76] Yount S, Schoessler M. A description of patient and nurse perceptions of pre-operative teaching. J Post Anaesthesia Nursing 1991;6(1):17–25.
[77] Bradley C. Psychological factors affecting recovery from surgery. In: Watkins J, Salo M, editors. Trauma, stress and immunity in anaesthesia and surgery. London: Butterworth, 1982:335.
[78] Reid JH. Meeting the informational needs of patients in a day surgery setting: an exploratory level study. Br J Theatre Nursing 1997;7(4):19–24.
[79] Lancaster KA. Patient teaching in ambulatory surgery. Nursing Clin North Am 1997;32(2):417–27.
[80] Lea SG, Phippen ML. Client education in the ambulatory surgery setting. Seminars in Peri-operative Nursing 1992;1(4):203–23.
[81] Lewin JME, Razis PA. Prescribing practice of take-home analgesia for day case surgery. Br J Nursing 1995;4(18):1047–51.
[82] Leino-Kilpi H, Iire L, Suominen T, Vuorenheimo J, Välimäki M. Client and information: a literature review. J Clin Nursing 1993;2(6):331–40.
[83] Mukumba S, Wright M, Punchihewa VG. Notes on a unlimited telephone helpline. J One-Day Surg 1996;6(3):14.
[84] Buttery Y, Sissons J, Williams KN. Patients' views one week after day surgery with general anaesthesia. J One-Day Surg 1993;3:6–8.
[85] Longsdale M, Hutchison GL. Patients' desire for information about anaesthesia. Anaesthesia 1991;46:410–2.
[86] Farnill D, Inglis S. Patients' desire for information about anaesthesia: australian attitudes. Anaesthesia 1993;48:162–4.
[87] Goldmann L, Ogg TW, Levey AB. Hypnosis and day case anaesthesia. Anaesthesia 1988;43(6):466–9.
[88] Hazelgrove JF, Robins DW. Caring for the carer: an audit of the day surgery services for carers within the Wessex region of England. Ambulatory Surg 2000;8(1):13–8.
[89] Icenhour ML. Quality interpersonal care: a study of ambulatory surgery patients' perspectives. Amer Operating Room Nurses J 1988;47(6):1414–9.
[90] Foulger V. Patients' views of day-case cardiac catheterisation. Professional Nurse 1997;12(7):478–80.
[91] Bostrom J, Caldwell J, McGuire K, Everson D. Telephone follow-up after discharge from the hospital: does it make a difference? Appl Nursing Res 1996;9(2):47–52.
[92] Bostrom J, Crawford-Swent C, Lazar N, Helmer D. Learning needs of hospitalised and recently discharged patients. Patient Education and Counselling 1994;23:83–9.
[93] Wilkinson D, Bristow A, Higgins D. Morbidity following day surgery. J One-Day Surg 1992;2(1):5–6.
[94] Bubela N, Galloway S, McCay E, McKibbon A, Nagle L, Pringle D, Ross E, Shamian J. The patient learning needs scale: reliability and validity. J Adv Nursing 1990;15(10):1181–7.
[95] Donoghue J, Pelletier D, Duffield C, Gomez-Fort R. Laparoscopic day surgery: the process of recovery for women. Ambulatory Surg 1995;3(4):171–7.
[96] Kleinbeck SVM, Hoffart N. Outpatient recovery after laparoscopic cholecystectomy. Assoc Operating Room Nurses J 1994;60(3):394–402.
[97] Lindén I, Engberg IB. Patients' opinions of information given and post-operative problems experienced in conjunction with ambulatory surgery. Ambulatory Surg 1996;4:85–91.
[98] Bradshaw C, Pritchett C, Bryce C, Coleman S, Nattress H. Information needs of general day surgery patients. Ambulatory Surg 1999;7(1):39–44.
[99] Woodhouse M, King TA, Challiner A. Impact of day surgery on community services. J One-Day Surg 1998;8(1):3–4.
[100] MacAndie C, Bingham BJG. Day case nasal surgery: patient satisfaction and the impact on general practitioner workload. J One-Day Surg 1998;7(3):7–11.
[101] Knudsen VJ. An audit of day surgery carers. J One-Day Surg 1996;6(2):5–6.
[102] Cahill J. Basket cases and trollies: day surgery proposals for the millennium. J One-Day Surg 1999;9(1):11–2.
[103] Sanderson IM. The clinical negligence scheme for trusts: a review of its present function. Clin Risk 1998;4:35–43.

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Abstracts

Ambulatory surgical treatment of varicose veins under intradural anesthesia

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Introduction: Nowadays ambulatory surgery is the fastest growing subspecialty within clinical anesthesiology owing to the advances in anesthetic and surgical technology. Several side effects of subdural anesthesia (postdural puncture headache, impairing the ability to ambulate and void) can prevent the challenge of anesthesia for ambulatory patients (rapid return to street readiness). The aim of this study was to evaluate spinal anesthesia by using pencil point needles in adult outpatient surgery (uni or bilateral saphenectomy).
Material and method: We studied prospectively 520 patients operated on for saphenectomy. After vascular replacement, 10 ml/kg of Hartman' solution, and a premedication with metoclopramide, 10 mg, and midazolam, 0.03 mg/kg, patients received subdural anesthesia (pencil point needle 25–27 G) with either 60 mg of mepivacaine 0,2% unilateral saphenectomy or bupivacaine 0.5% 10 mg or 0.25% 7.5 mg (bilateral saphenectomy). We measured in every patient sensitive block, heart rate, blood pressure, surgery duration, time for hospital discharge and side effects (nausea/vomiting, urinary retention, and PDPH).

Keywords: Spinal anesthesia; Saphenectomy; Ambulatory surgery; Pencil point needles

Endoscopy in a gynecological ambulatory surgical unit

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Over the last decades we have been able to increase the number of surgical procedures undertaken in day surgery units due to two main factors: the outstanding progress in the techniques used in anesthesia and the development of endoscopy. In gynecology this fact has been particularly significant due to laparoscopy and histeroscopy. In this paper we present their possibilities in our environment.

Keywords: Ambulatory surgery; Day surgery; Gynecology; Endoscopy; Laparoscopy; Histeroscopy

Mycrolaryngeal surgery as ambulatory surgery. Results during the period 1995–1998

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The objective is to prove that microlaryngeal surgery is a safe procedure to include as ambulatory surgery.
We reviewed the direct laryngoscopies performed as ambulatory surgical procedures in a day surgery unit during the 1995–1998 period. In this retrospective study 132 patients were included. The type of pathology, anaesthetic risk, intra and postoperative complications and discharge criteria were analyzed.
Only 3.78% of the patients had some intraoperative complication, three, bronchial spasm and two, skin rash. Among the causes of admission to the hospital

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(4.54%), social problems, not related to surgical procedures (2.27%), nausea and vomiting (0.76%), fever (0.76%) and dizziness (0.76%) were the most common. We conclude that microlaryngeal surgery can be safely performed as an outpatient procedure as long as the patients are selected.

Keywords: Ambulatory surgery; Laryngoscopy