Hospital anaesthesia and general practice

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Topics of particular interest to the anaesthetist

Past medical history
Previous anaesthetic history
Drug treatment
Allergies
Family history
Social history

Introduction

It is usual for the full preoperative assessment of patients presenting for anaesthesia to take place after admission to hospital. This assessment may disclose risk factors previously not recorded in the hospital notes but possibly known to the patients or their general practitioners. It would be beneficial if general practitioners were familiar with the issues that concern anaesthetists when patients are referred for admission to hospital—in particular, whether they can be treated as day cases. After being discharged from hospital patients may present with unusual signs or symptoms that are related to the anaesthesia.

We review some of the more common issues of managing patients before and after they receive an anaesthetic which may cause problems and which are relevant to anaesthetists and general practitioners (see box).

Past medical history

When admitted to hospital patients often forget or fail to volunteer important information which understandably they may regard as irrelevant to the management of their illness. Similarly, in referring patients general practitioners may not fully appreciate the importance of some aspects of a patient's history or treatment to the proposed anaesthetic procedure.

CARDIOVASCULAR DISEASE

Cardiovascular disease is one of the commonest problems presented to the anaesthetist. Patients with untreated hypertension tend to have labile cardiovascular responses during anaesthesia and respond poorly to some anaesthetic agents, blood loss, and positioning.¹ Procedures associated with pronounced sympathetic activity, such as laryngoscopy and intubation,² can cause such patients stress and induce hypertensive and acute myocardial ischaemia. During intubation a patient's blood pressure can rise from 160/100 mm Hg to 250/140 mm Hg or higher. Consequently, hypertension should be controlled before the operation. Failure to identify hypertension before a patient is referred for surgery under general anaesthesia is one of the most common causes of avoidable cancellation. In the absence of symptoms and electrocardiographic changes a diastolic pressure of less than 110 mm Hg does not seem to be associated with an appreciable increase in morbidity.³ Ideally, however, blood pressure should be within the normal range for the patient's age. Patients with ischaemic heart disease often have limited cardiovascular reserves and any associated hypertension should be rigorously controlled.

A patient who has anaesthesia within six months of a myocardial infarction carries a considerable risk of reinfarction. Goldman has identified several cardiovascular abnormalities which increase the morbidity and mortality of anaesthesia and surgery (see box).⁴ These risks are further enhanced when the patient is elderly or the operation is an emergency.

RESPIRATORY DISEASE

Respiratory disease presents the anaesthetist with several problems. Anaesthesia is associated with a fall in compliance, functional residual capacity, and air trapping in the dependent airways leading to an

imbalance between ventilation and perfusion. Endotracheal intubation can induce profound bronchospasm in susceptible patients. Postoperative atelectasis is not uncommon, especially in association with thoracic and upper abdominal surgery, obesity, postoperative immobility, and pre-existing chronic obstructive airways disease.⁵ Acute upper respiratory tract infections can be exacerbated by anaesthesia, and all but the briefest procedures should be postponed for seven days; this is especially important for patients with asthma.

Anaesthesia should be avoided in patients with exacerbated chronic obstructive airways disease. Co-existent infections and reversible bronchospasm should be treated in good time with medication and physiotherapy. Time spent before the operation optimising the patient's respiratory function is worth while and may avoid the need for intensive therapy after the operation. Vital capacity and peak flow measurements are a useful and simple means of assessing preoperative treatment. In patients with chronic obstructive airways disease elective surgery should be avoided during the winter months.

ASPIRATION OF STOMACH CONTENTS

Patients with hiatus hernia may aspirate stomach contents. Gastro-oesophageal reflux is a potentially fatal condition for a patient under anaesthesia; regurgitation and aspiration of gastric contents is associated with appreciable morbidity and a mortality of 25%. Not surprisingly, many patients with known but asymptomatic hiatus hernias fail to volunteer this information. Any history of reflux is relevant since treatment with antacids with H₂ antagonists before the operation can offer substantial protection by raising the gastric pH.⁶ Symptomatic improvement may also be obtained if a patient loses weight and reduces alcohol and tobacco use.

Patients who are referred to hospital with acute conditions for which anaesthesia may be required should not eat or drink until instructed to do so by the hospital staff. Patients with oesophageal reflux or full stomachs require anaesthetic techniques that are designed to minimise the possibility of pulmonary aspiration.

OBESITY

Obesity can be a major complication, and the hazards of anaesthesia and surgery are greatly increased (fig 1). Obesity is associated with an increased incidence of cardiovascular disease, respiratory inadequacy during and after anaesthesia, difficulties with intubation, gastro-oesophageal reflux, and postoperative complications.⁷ Obese patients should be encouraged to lose weight when elective surgery is being considered.

Preoperative cardiovascular factors associated with enhanced morbidity and mortality after anaesthesia and surgery⁴

Raised jugular venous pressure
Gallop rhythm
More than five ventricular ectopic beats per minute
Rhythm other than sinus rhythm
Appreciable aortic stenosis
Myocardial infarction in preceding six months

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FIG 1—In an obese patient with a receding chin it may be difficult to visualise the larynx. (Photograph courtesy of Dr S Cook)

MUSCULOSKELETAL DISORDERS AND ARTHRITIS

In patients with arthritis or musculoskeletal disorders it may be difficult to maintain the airway or perform endotracheal intubation if the cervical spine or the temporomandibular joints are affected.⁸ Arthritis of the cervical spine or cervical spondylosis can be exacerbated by attempts at intubation. Calcification of the lumbar spine may make it impossible to give a spinal or epidural anaesthetic. Patients with scoliosis often develop impaired respiratory and cardiovascular function and are often hypoxaemic, have a diminished vital capacity, and show an imbalance of ventilation and perfusion. Pulmonary hypertension leading to right ventricular failure may also arise. Scoliosis is often associated with various muscle diseases.

TEETH

If teeth are loose or diseased they may be damaged or dislodged during anaesthesia (fig 2). Aspiration of dental fragments can cause bronchospasm, airways obstruction, and infection necessitating removal of the fragments with a bronchoscope. Patients should be encouraged to have loose teeth attended to before surgery. Expensive and complex prosthetic dentition renders endotracheal intubation more demanding, and damage to teeth and prostheses is a common cause of litigation.⁹

PREGNANCY

Anaesthesia is best avoided during the first trimester of pregnancy, and any essential elective surgery should be postponed until the second trimester. Pregnancy should be excluded before an anaesthetic is given. Pregnant patients requiring anaesthesia present several problems for the anaesthetist, the most important being gastro-oesophageal regurgitation and supine hypotension due to aortocaval compression in the supine position.^{10 11}

Previous anaesthetic history

Any information that the general practitioner has about a patient that may be related to previous anaesthetics should be noted in hospital referral letters. To this end anaesthetists should be encouraged to

inform general practitioners of notable problems with anaesthesia, particularly if these are likely to recur. Adverse reactions to drugs or perioperative incidents such as difficulties with intubation or awareness during anaesthesia are especially important. Repeat administration of halothane within three months is contraindicated in adults; a potentially fatal halothane hepatitis can be induced.¹² Altered liver function test results, jaundice, or fever occurring after anaesthesia are important and need a detailed review. Patients who have had a complication with anaesthesia may fear a recurrence, but precautions can be taken to minimise that possibility and to reassure the patient.

Drug treatment

It is important to know a patient's current and recent drug treatment since drug interactions with anaesthetic agents are common. With a few notable exceptions all drug treatment should be maintained until the anaesthetic is given. This is especially important with treatment for cardiovascular disease where withdrawal may be associated with cardiovascular instability and the risk of perioperative myocardial ischaemia.¹³ Table I lists commonly used drugs of concern to the anaesthetist. Several important interactions necessitating drug withdrawal preoperatively are discussed below.

Oral contraceptive pill—The association of the oral contraceptive pill, surgery, and anaesthesia with thromboembolic disease is well known.¹⁴ Hypotensive anaesthesia carries a risk of cerebral thromboembolism and would be contraindicated in patients taking the pill. Current guidelines on the management of patients may be found in the *British National Formulary*. For patients having minor elective procedures with full recovery and mobilisation the same day the low dose oestrogen pill need not be stopped. An exception to this would be surgery on the legs or feet such as for varicose veins. A previous or family history of

TABLE I—Drugs of special importance when an anaesthetic is given

Drug	Effect
Cardiovascular drugs:	
β blockers	Cardiovascular instability if stopped prematurely ¹⁵
Calcium channel blockers	Enhanced negative inotropic and chronotropic effects in association with some volatile anaesthetics ⁹
Diuretics	Hypokalaemia provoking arrhythmias and prolonged neuromuscular blockade
Digoxin	Enhanced arrhythmias especially if associated with hypokalaemia
Antibiotics	Many antibiotics of the aminoglycoside group can potentiate neuromuscular blockade and induce microsomal enzymes
Psychopharmacological drugs:	
Monoamine oxidase inhibitors	See text
Tricyclic antidepressants	Enhanced arrhythmias with some volatile anaesthetics
Lithium	Potential of neuromuscular blockade
Neuroleptics	Exaggerated hypotensive effects in association with anaesthesia
Antiepileptic agents	Microsomal enzyme induction and high protein binding—some anaesthetic agents are mildly epileptogenic
Antiplatelet drugs:	
Aspirin	May enhance haematoma formation with regional anaesthetic techniques
Dipyridamole	Supplementation necessary to avoid cardiovascular instability perioperatively—supplementation necessary up to three months after treatment is stopped
Steroids	
Phospholine iodide	See text
Timolol maleate	See text
Oral contraception	See text

thromboembolic disease, smoking, diabetes, obesity, or hypertension would necessitate caution. Oestrogen based pills should be stopped four weeks before elective surgery that will require postoperative immobility. The pill should be restarted at the first menses occurring at least two weeks after the procedure, assuming the patient is fully mobilised. Alternative methods of contraception should be used in the interim. Progesterone only pills need not be stopped. Where anaesthesia and surgery are unavoidable in a patient on the pill then low dose heparin or intravenous dextran in the postoperative period may be indicated.

Phospholine iodide (ecothiopate iodide) eye drops—These have anticholinesterase activity and attenuate the metabolism of suxamethonium chloride, a short acting neuromuscular blocking drug, leading to prolonged apnoea.¹⁵ Ecothiopate is extensively protein bound and treatment needs to be discontinued three weeks before anaesthesia is given. Patients can generally be easily managed, however, if they remain on phospholine provided the anaesthetist knows of the treatment.

Timolol maleate eye drops—Systemic absorption of the β antagonist timolol from ophthalmic drops can cause respiratory and cardiovascular side effects. Bronchospasm and bradycardia are most commonly seen. A profound bradycardia may occur during ophthalmic surgery if an ocular-cardiac reflex is induced by traction on extraocular muscles.

Monoamine oxidase inhibitors—Giving anaesthesia to a patient who has taken a monoamine oxidase inhibitor within 14 days can be potentially fatal due to drug interactions—in particular with pethidine. Complex and poorly understood interactions with narcotic analgesics and sympathomimetic amines necessitates a careful choice of anaesthetic technique in such patients. Monoamine oxidase inhibitors should ideally be stopped at least two weeks before an anaesthetic is given and in consultation with a psychiatrist. The monoamine oxidase B inhibitors (selegiline), used in severe parkinsonism, seem not to interact and need not be stopped; no reports of interactions with this drug have appeared in publications on anaesthesia.

Allergies

Any history of atopy is relevant. Anaphylactic and anaphylactoid reactions, as well as halothane hepatitis,

occur more commonly in people who are atopic. Many drugs used in anaesthesia have the potential to release histamine and provoke severe anaphylactoid reactions. That these severe reactions are seldom fatal can probably be attributed to the immediate availability of skilful care and facilities.

Family history

Fortunately, inherited conditions of concern to the anaesthetist are rare. Table II lists the most important disorders.

TABLE II—*Inherited or familial disorders of relevance to anaesthesia*

Disorder	Implications
Pseudocholinesterase	Atypical cholinesterase resulting in prolonged paralysis after suxamethonium chloride is given; family members should be tested to identify those at risk ²⁰
Porphyria	Acute porphyria can be precipitated by several anaesthetic agents and careful selection of anaesthetic technique is required
Malignant hyperpyrexia syndrome	Very rare but lethal subclinical myopathy provoked almost exclusively by some anaesthetic agents; family members need to be investigated to identify those at risk ²¹
Haemoglobin S	Sickle cell trait is less obvious than the disease; sickle tests should be performed on patients of Indian, West Indian, and African origin
Hypertlipidaemia	Increased probability of serious cardiovascular disease
Sudden infant death syndrome	Potential association with malignant hyperpyrexia syndrome

Social history

Smoking—Smoking is associated with an increase in postanaesthetic complications, in particular respiratory disorders.¹⁶ High carboxyhaemoglobin concentrations impair oxygen transport, and cardiovascular and respiratory disorders are common. All patients should be encouraged to reduce or stop smoking several weeks before receiving anaesthesia.

Alcohol—Excessive alcohol consumption can lead to tolerance of anaesthetic agents, increased gastric acid production, and oesophageal reflux; enzyme induction and tissue tolerance to anaesthetic agents often develop. A withdrawal syndrome may develop postoperatively. In addition, alcoholics often have diminished adrenocortical responses, electrolyte and fluid imbalance, bone marrow depression, and cardiomyopathy.¹⁷

Drug abuse—Abuse of "street drugs" presents problems. Access to veins may be limited, and the risk to staff and patients of infection with hepatitis B and the human immunodeficiency virus is of great concern. It is important for hospital staff to be aware of behaviour that might suggest a risk of contracting these infections so that precautions may be taken.

Postoperative considerations

General practitioners may be consulted by patients who have recently had anaesthesia (particularly as day surgery has increased) with a variety of symptoms related to anaesthesia.

Suxamethonium chloride myalgia ("scoline" pains)—Myalgia may follow the use of suxamethonium chloride for endotracheal intubation. Muscle pains can be severe, particularly when they occur the day after anaesthesia. The incidence in ambulant patients is about 60%. The pains are often diffuse but usually

FIG 2—Chronic periodontal disease. If teeth are loose or diseased they may be damaged or dislodged during anaesthesia. (Courtesy of the Department of Oral Pathology, Dental School, University of Newcastle upon Tyne)

affect the large muscle masses such as the pectoral and neck muscles. The discomfort is self limiting and best managed by bed rest and simple analgesics.

Sore throat—A sore throat is a common occurrence after anaesthesia with or without endotracheal intubation. Symptomatic treatment is usually sufficient. Intubation can cause persistent hoarseness, in which case an opinion should be sought from an ear, nose, and throat surgeon as granulomatous lesions of the vocal chords may occur.

Thrombophlebitis—Phlebitis may occur at the site of intravenous cannulation and drug administration. Many anaesthetic agents are irritant when injected extravascularly, and the discomfort persists for several days.

Loss of radial pulse—An absent radial pulse may follow the insertion of an intra-arterial cannula for intraoperative measurement of blood pressure during major or hypotensive anaesthesia. The pulse usually returns in a few weeks.

Shoulder tip pain—Pain over the shoulder, often persisting for several days, may follow laparoscopy in which carbon dioxide is insufflated into the abdominal cavity. The discomfort passes off as the gas is reabsorbed or when the patient is lying down.

Epidural anaesthesia—Epidural anaesthesia may be associated with some transient local tenderness at the injection site. About 1% of patients will experience a "dural tap"—that is, inadvertent puncture of the dura by a large 16 gauge or 19 gauge epidural needle. This can lead to symptoms of neck stiffness, headache, photophobia, nausea, and vomiting 24 to 48 hours later. The headache is classically postural, symptomatic relief being obtained when the patient lies flat, and 24 hours of supine bed rest usually resolves the discomfort. In severe, persistent cases a small quantity of the patient's own blood can be injected into the epidural space at the level of the puncture to occlude the dural puncture—a so called epidural "blood patch." Patients who have persistent headache after spinal or epidural anaesthesia should be referred to hospital for review and management where necessary.

Spinal anaesthesia—Spinal anaesthesia is ideally performed with fine needles (eg, 26 gauge) and rarely causes postanaesthetic headaches. The patient may be unaware of having had a spinal as it is not uncommon to combine a spinal with a general anaesthetic or heavy sedation. Persistent headache due to dural puncture can be treated with a "blood patch."

Nerve palsies—Peripheral nerve palsies may rarely follow peripheral nerve block for local anaesthesia. The radial, ulnar, and sciatic nerves can be subject to traumatic compression during anaesthesia or during

recovery. Similar injuries can be produced by surgical tourniquets.

Corneal abrasion—While unconscious patients cannot protect themselves from injury. The eyes are particularly at risk of injury during head and neck surgery and appropriate protection of the eyes is routine. Corneal injury may occur, however, whenever the patient is unconscious.

Awareness during anaesthesia—Awareness is a common fear of many patients who are about to undergo anaesthesia. The incidence of awareness is estimated to be about 1%. Awareness usually amounts to a limited auditory recall of events, but on occasions the patient may have a full and detailed recall of events and experience pain. Postoperative neurosis as a consequence has been described.²² Any suggestion of awareness should be followed up. A full and frank explanation of the events is desirable.

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ANY QUESTIONS

Is there any evidence to suggest that nasal polypectomy precipitates or worsens asthma?

An association between nasal polyps and asthma has been recognised for over a century. Several recent studies have shown the frequency of this association. The frequency of nasal polyps in people with proved nasal allergy seems to be about 4%; in those with nasal allergy and asthma the frequency is 6-7%.¹ Roughly 20% of patients with polyps have asthma and about 30% of patients with asthma have polyps.²

Asthma undoubtedly occurs in some patients shortly after nasal polypectomy but is rare. Only 2% of polypectomies are followed by asthma, and in only 0.5% does this occur within a few months.³ In a very few patients asthma occurs within days of the procedure, and it is the frequent occurrence of asthma within 24-48 hours that might be expected if polypectomy was truly a precipitating factor and not just a chance occurrence in two diseases that so frequently coexist. It also seems true that those people with asthma who have coexistent nasal polyps have severe nasal polyps that require more frequent surgical removal. It is much more

likely, therefore, that in these patients an asthma attack follows nasal polypectomy as a chance occurrence.

Other evidence against a precipitating relation is that the onset of asthma occurs more frequently before the onset of nasal polyposis (ratio 2.5:1) and that the highest rate of the onset of asthma occurs on either side of the time of first polypectomy, with an even distribution about this point.² A wealth of anecdotal evidence testifies to the improvement of lower respiratory tract symptoms after polypectomy. Though this is unproved it is at least logical, as the copious quantities of often infected nasal secretion and the constant mouth breathing accompanying nasal polyposis are hardly likely to improve any lower respiratory tract symptoms.

Episodes of asthma immediately after polypectomy do occur but are rare. All evidence so far points to this occurrence being one of chance, for the two diseases often coexist and have common aetiological factors. The long term effect of nasal polypectomy on asthma is probably beneficial. — W V CARLIN, ear, nose, and throat surgeon, Stoke on Trent

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