Anaesthesia and perioperative care for elderly surgical patients

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SYNOPSIS

Age alone is no longer a barrier to surgery. Ageing changes the body's capacity to cope with the stress of illness and surgery. The anaesthetist must assess these changes and the perioperative factors which contribute to poor outcomes. To reduce morbidity and mortality there must be adequate pain control, thromboembolic prophylaxis and correction of inadequate nutrition and hydration. In the postoperative period there is a need to be alert for sepsis and delirium. An admission to hospital also provides an opportunity to assess the patient's other health care needs.

Index words: ageing, analgesia, thromboembolism.

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Introduction

In Australia in recent years spending has increased to support the care of elderly patients. This movement includes surgical care and is supported by an accumulation of evidence which shows that age alone can no longer be considered an independent risk factor for a poor outcome following general surgery.[1] 'With continual improvements in both anaesthesia and surgical expertise, surgery can no longer be denied to patients solely on the basis of age'.[2] It is arguable that a patient would ever be considered unsuitable for anaesthesia, rather unsuitable for the proposed surgical procedure.

The challenge we face in this decade is refining our skills to determine with more precision where the balance is between the benefit and cost (including harm) of matching interventions to each patient's needs. At a practical level, there is much that can be done to curb costs and wastage through better management of perioperative care, to foster multidisciplinary approaches and give appropriate time and resources to the appropriate care of elderly patients.

Understanding the impact of the ageing process

Understanding the physiological, pharmacodynamic and pharmacokinetic impact of the ageing process is important (Table 1).

The effects of ageing in an individual patient are accentuated by disease. The reductions in functional reserve in each organ system represent parallel reductions in the patient's capability to maintain homeostasis in the face of surgical stress and the actions of anaesthetic drugs.

After considering the effects of ageing and assessing the impact of the particular elderly patient's burden of illness – the surgical pathology itself, and any coexisting diseases – the anaesthetist is better equipped to appraise the factors which determine the risk of a poor outcome. With such foreknowledge it should be possible to prepare a management plan which minimises the impact of such risks. This is the crux of the preoperative assessment process. It requires the anaesthetist to spend time with the patient and must not be compromised by short-sighted 'drives for efficiency'.

The scope for tailoring anaesthetic management to the patient's condition has been widened considerably recently with good data upon which to base management decisions and the addition of several important drugs to our pharmacopoeia. These drugs have less lingering hypnotic and depressant effects.

Table 1

Effect of age on physiological processes
(The data in this table were accumulated from 'average' and healthy populations)

Function	*Percentage decline from age 20-30 years to age 60-80 years*
body temperature, arterial pH	0%
total number of neurones	0.2%
resting pulse rate, height, craniocerebral index	5%
nerve conduction, haematocrit, body weight, total lung capacity	10%
albumin, maximum pulse rate, basal metabolic rate, body water, arterial oxygen tension (PaO_2)	15%
total body potassium	15–20%
diet, renal mass, FEV_1, brain weight	20%
muscle mass, intracellular water, hypoxic and hypercarbic responses	25%
tissue oxygen delivery	20–30%
vital capacity, cardiac index, cerebral blood flow, alveolar parenchyma	30%
maximum oxygen uptake, anaerobic threshold, creatinine clearance, lean body mass	35%
number of alveoli	30–40%
glomerular filtration rate	40%
hepatic blood flow	40–50%
cortical neurones, renal plasma flow, ventilatory reserve	50%
maximum breathing capacity	60%

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Optimum management of perioperative care

Alongside rigorous planning of anaesthetic management there should be optimum management of perioperative medical care by a multidisciplinary team. This team tackles those conditions which contribute to morbidity and prolonged aftercare:

- pain
- delirium
- sepsis
- deep vein thrombosis
- poor nutrition and hydration
- rehabilitation planning.

The available evidence showing the benefit of taking specific measures directed at each of these factors has been reviewed in patients with hip fracture.[3]

Adequacy of pain control

There is a complex interplay between each patient's sensitivity to pain and the effectiveness of analgesic strategies. Perioperative pain management in elderly patients is therefore never routine.

Practically none of the analgesic drugs in current use are purely pain relieving. Opioids, non-steroidal anti-inflammatory drugs and local anaesthetics have a plethora of actions and consequently a host of reported adverse effects. For this reason alone, prescribing and medication administration routines result in many elderly patients receiving inadequate analgesia. A study of analgesic delivery after hip fracture highlighted the fact that patients with dementia received one third of the equivalent analgesic medication given to patients without cognitive impairment.[4] The authors commented that quite apart from the inhumanity, such care can only worsen the progress of cognitive dysfunction.

The implications for patient care are clear. We must give time and professional effort to assessing pain control. For example, to discern whether an elderly patient's sleep disturbance and its deleterious effect on their orientation is the result of inadequate or excessive analgesia requires astute observation and continuity of supervision. These roles are increasingly the province of the acute pain services which most hospitals have developed.

Delirium

Delirium is an organic mental disorder characterised by acute onset, altered level of consciousness, fluctuating course and disturbances in orientation, memory, attention, thought and behaviour. It is associated with significant increases in functional disability, length of hospital stay, rates of admission to long-term care institutions, mortality and health care costs.

In the perioperative period, when there is a confluence of factors (for example drug effects, poor pain control, infections, unfamiliar environment and sensory deprivation) the prevalence of delirium increases to 15–50% of patients in the over-70 age group.[5] An earlier systematic review highlighted the frustration in managing delirious patients and the poor absolute risk reduction achieved by attempts at preventive strategies.[6] That review was made difficult by the small number of studies and the small numbers of patients in each one. A more recent study of 852 general medical patients shows the benefits of multicomponent therapy aimed at each of the known risk factors.[7] This approach is very likely to be equally applicable to surgical patients where the risk factors include:

- pre-admission cognitive impairment
- sleep deprivation
- immobility
- visual impairment
- hearing impairment
- dehydration.

Sedative-hypnotic and anticholinergic medications in general should not be used because of their central nervous system effects. A quiet environment and a supportive reorientation should be encouraged. This is the regular gentle and empathetic evaluation of mental state and level of comfort of the elderly patient.

Sepsis

Postoperative infection is a significant contributor to mortality and morbidity. This can be related to the operative site, to developing urinary tract or respiratory infection or to hospital-acquired sepsis at cannula sites.

Recognition of infection in elderly patients is frequently delayed. In part this may relate to the nature of the patient, but also to the altered symptoms and signs of infection in elderly patients. In comparison with younger patients, the absence of fever and the masking of other signs (e.g. tachycardia) by concurrent drug therapy mean that the diagnosis of infection is often not made until sepsis is well established.

The evidence for the benefits of antibiotic prophylaxis is convincing. There was a 44% reduction in the incidence of infection in a meta-analysis of seven studies that compared antibiotic use with placebo for elderly patients undergoing hip arthroplasty.[3] Weaker (in terms of not being generated by systematic review or randomised controlled clinical trial), but compelling evidence is available for the benefit of antibiotic prophylaxis in gynaecological[8] and urological[9] surgery.

Deep vein thrombosis prophylaxis

As there is an increased incidence of venous thrombosis and pulmonary embolism after surgery, thromboembolic prophylaxis has been endorsed by almost all recent studies of elderly surgical patients.[10] This may take many forms, from low-dose heparin (unless contraindicated, for example immediately after neurosurgery) to low molecular weight heparin and aspirin. The beneficial effect of compression stockings is indisputable.[11]

Nutrition and hydration

Both the level of hydration and the balance of nutritional requirements need attention in elderly patients. Recognising

nutritional deficits and correcting them contributes significantly to improved outcomes for older surgical patients. This has been particularly clearly shown in patients with femoral neck fractures.[12,13]

Rehabilitation planning

Early mobilisation improves patients' perceptions and orientation as well as shortening hospital stay. There are but a few clinical situations where strict bed rest needs to be enforced. Furthermore, in orthopaedic patients, the benefits of postoperative exercise and balance training in reducing falls and facilitating discharge have been substantiated in a recent systematic review.[14]

The surgical episode as an opportunity for enhancing life quality

For a significant proportion of elderly patients, a surgical procedure represents the first medical contact the patient has made for some time, if not the first ever. For others it affords the opportunity to work in liaison with the general practitioner to review and stabilise therapy for coexisting disease in a supervised environment.

The whole episode should ideally be one of holistic care, with evaluation of and provision for all the health needs of the patient. Examples of beneficial parallel interventions range from the simple, such as reviewing medication, to the more complex, such as getting hypertension under control and preventing its contribution to the progression of dementia.[15] The aim should be to enhance the quality of life where possible. In this context, the anaesthetist's role is significant and complementary.

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Conflict of interest: none declared

Self-test questions

The following statements are either true or false (answers on page 47)

7. Patients with cognitive impairment require less postoperative analgesia than other patients.
8. Older patients have fewer alveoli than younger adults.

New drugs

Some of the views expressed in the following notes on newly approved products should be regarded as tentative, as there may have been little experience in Australia of their safety or efficacy. However, the Editorial Committee believes that comments made in good faith at an early stage may still be of value. As a result of fuller experience, initial comments may need to be modified. The Committee is prepared to do this. Before new drugs are prescribed, the Committee believes it is important that full information is obtained either from the manufacturer's approved product information, a drug information centre or some other appropriate source.

Amprenavir

Agenerase (Glaxo Wellcome)

150 mg capsules, and 240 mL bottles containing 15 mg/mL oral solution

Approved indication: HIV-1

Australian Medicines Handbook Section 5.3.5

Amprenavir is the fifth protease inhibitor to be approved for use in Australia. It can be used to treat HIV infection in combination with other antiretroviral drugs, such as zidovudine and lamivudine. By inhibiting the protease in HIV-1, amprenavir results in the production of non-infectious virions.

Patients take amprenavir twice a day. As the dose is 20 mg/kg the patients need to take several capsules. The oral solution is