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Geriatric Anesthesia

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ANAESTHESIA
2023 -2024

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Geriatric Anesthesia

The geriatric population (The elderly) experiences significant alterations of many organ systems as a result of the aging process. They also have several co-morbidities including hypertension, cardiac disease, diabetes, cerebrovascular disease, and renal dysfunction. Geriatric patients are considered vulnerable and especially sensitive to the stress of trauma, surgery, and anesthesia

GERIATRIC ANESTHESIA STRATEGIES

A. Preoperative Evaluation

Tests should be directed toward the type of surgery, known co-existing disease, and history and physical examination findings. Electrocardiogram (ECG), hematocrit (Hct), and hemoglobin (Hgb) are often the most useful tests

1)Cardiac .

Major indicators of cardiovascular risk are unstable coronary syndrome, decompensated heart failure, significant or unstable dysrhythmias, and severe or critical valvular disease, especially aortic stenosis. Cardiac testing should be reserved for patients .undergoing intermediate- or high-risk surgery

2)Pulmonary

Referral to a pulmonologist may be indicated if the patient has signs and symptoms of undiagnosed or decompensated lung dysfunction. Risk factors for postoperative pneumonia include the inability to carry out the activities of daily living, weight loss of 10% or more in the previous 6 months, history of stroke, long-term .steroid use, smoking, and underlying lung disease

3)Renal

It is wise to obtain serum electrolyte levels and creatinine concentration before procedures that carry a significant risk of renal failure (e.g., cardiopulmonary bypass, aortic aneurysm resection, or

surgeries in which large fluid shifts or significant blood loss are .anticipated)

4)Hepatic

Baseline liver function tests may be reasonable before surgeries .that involve significant liver manipulation

5)Diabetes Mellitus .

Poor glucose control (blood sugar higher than 200 mg/dL) is ,associated with a risk of aspiration, poor wound healing, infection cardiac and cerebral events, and autonomic dysfunction. Whenever possible, control of serum glucose to levels of 120 to 180 mg/dL is .desirable before surgery

6)Malnutrition

Serum albumin below 3 g/dL with hypocholesterolemia and low body mass index is indicative of malnutrition

B. Pharmacokinetics and Pharmacodynamics

There is no evidence that any specific inhaled or injected anesthetic agent is preferable in elderly patients. Changes in body composition can affect the distribution, metabolism, and clearance of drugs.

1. Total Body Water:
2. Adipose to Lean Muscle Ratio:
3. Circulation Levels of Drug-Binding Proteins:
4. Decreased Cardiac Output.
5. Muscle Relaxant Effects
6. Multiple Drug Prescriptions
7. Minimum Alveolar Concentration (MAC) of Volatile Agents

MAC decreases with age, about 4% per decade after 40 years of age.

C. Anesthetic Plan: Anesthetic management for elderly

Patients require consideration of many details

1. Anesthetic Technique
2. Monitoring
3. Optimal Analgesia

Postoperative Delirium

Delirium is defined as an acute alteration in cognitive function

n that progresses over a brief period lasting for a few days to a few weeks.

Risk Factors

1. Advanced age (>70)
2. Underlying dementia .
3. Various comorbidities
4. Drugs (narcotics and benzodiazepines).
5. Alcohol abuse.
6. Previous episodes of delirium.
7. Visual impairment.

8. Certain types of injuries (e.g., hip fractures).
9. Elevated blood urea nitrogen (BUN).

Treatment

Treating underlying disorders, 0.25 to 2 mg of oral haloperidol for acute control of delirium is the preferred treatment, but diazepam, droperidol, and chlorpromazine are also often used with good results.

Similarities between elderly people and infants, compared with the general population.

Decreased ability to increase heart rate in response to hypovolemia, hypotension, or hypoxia
Decreased lung compliance
Decreased arterial oxygen tension
Impaired ability to cough
Decreased renal tubular function
Increased susceptibility to hypothermia

Age-related physiological changes and common diseases of the elderly.

Normal Physiological Changes	Common Pathophysiology
Cardiovascular	
Decreased arterial elasticity	Atherosclerosis
Elevated afterload	Coronary artery disease
Elevated systolic blood pressure	Essential hypertension
Left ventricular hypertrophy	Congestive heart failure
Decreased adrenergic activity	Cardiac arrhythmias
Decreased resting heart rate	Aortic stenosis
Decreased maximal heart rate	
Decreased baroreceptor reflex	

Respiratory

Decreased pulmonary elasticity	Emphysema
Decreased alveolar surface area	Chronic bronchitis
Increased residual volume	Pneumonia
Increased closing capacity	
Ventilation/perfusion mismatching	
Decreased arterial oxygen tension	
Increased chest wall rigidity	
Decreased muscle strength	
Decreased cough	
Decreased maximal breathing capacity	
Blunted response to hypercapnia and hypoxia	

Renal

- Decreased renal blood flow
  - Decreased renal plasma flow
  - Decreased glomerular filtration rate
- Decreased renal mass
- Decreased tubular function
  - Impaired sodium handling
  - Decreased concentrating ability
  - Decreased diluting capacity
  - Impaired fluid handling
  - Decreased drug excretion
- Decreased renin–aldosterone responsiveness
- Impaired potassium excretion
- Diabetic nephropathy
- Hypertensive nephropathy
- Prostatic obstruction
- Congestive heart failure