A Review of Risk Factors in Geriatric Patients

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Introduction

The purpose here is to understand the different risk factors in geriatric anesthesia and the techniques used to minimize these risks in the patients. Elderly patients tend to have chronic diseases, furthering the need to be vigilant in the type of care they receive. Each organ impacted by the disease can greatly influence the drug choices, fluid choices, and intubation techniques used by anesthesia providers. Understanding the underlying causes of the changes is important to understand the nature and purpose of the modifications. As such, we will be discussing some histological changes associated with aging that have implications for common chronic diseases.

Biggest Risks

Aspiration Pneumonia
Acute Renal Failure
POCD
Hypokalemia
Hyperkalemia
Hypothermia
Atrial Fib & Flutter
Ischemia

Predictive Factors of Outcome

- Metabolic Equivalent Task Scores (METS)
- Estimated Weekly Energy Expenditure
- Frailty
- Nutrition
- Pain Score
- BMI

Common Pathophysiology

Cardiac

Atherosclerosis
Coronary Artery Disease
Hypertension
Congestive Heart Failure
Cardiac Arrhythmias
Aortic Stenosis

Respiratory

Emphysema
Pneumonia
Chronic bronchitis
Obstructive lung disease
Restrictive lung disease

Renal

Diabetic Nephropathy
Hypertensive Nephropathy
Prostatic Obstruction

Drug Considerations

- MAC reduced 4% every decade after 40 y/o
- Volatile agent of choice: Desflurane
- Nearly 50% reduced dose requirements for: opioids, benzodiazepines, & induction agents
- Possible delayed recovery from muscle relaxants
- Muscle Relaxant of choice: Cisatracurium

Physiological Changes & Considerations

Respiratory

Closing capacity exceeds FRC at 65 in sitting position
Increased work of breathing
Increased risk of aspiration pneumonia
Inability to respond to hypoxia

Gastrointestinal

Decrease in rate of biotransformation and protein production
In men, plasma cholinesterase decreased
Prolonged gastric emptying
Increased gastric pH

Cardiac

Delays in onset of IV medications
Significant drop in BP during induction
Decreased sensitivity to adrenergic receptors
Increased risk of atrial fib and flutter
Inability to respond to hypovolemia or hypotension
Diastolic dysfunction

Neuro/Musculoskeletal

Muscle mass is reduced
Skin atrophied - susceptible to trauma
Increased threshold for all sensory modalities - touch, temperature, hearing, vision, etc.
Frail veins - rupture with IV infusion
Arthritic joints - positioning and regional

Metabolic/Endocrine

Basal and maximal oxygen consumption declines
Increased risk of hypothermia
~15% of pts. older than 70 y/o have diabetes

Renal

Decreased ability to excrete drugs
Impaired handling of Na+
Decreased ability to reabsorb glucose
Predisposed to hypokalemia and hyperkalemia
Inability to properly manage fluids

Conclusion

The discriminating operator who is diligent in assessing the health status of a patient is much more likely to anticipate complication from surgery, and adequate knowledge of surgical modifications serves to raise the standard of care for geriatric patients.

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