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Postanesthesia Care for the Elderly Patient

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ABSTRACT

Purpose: As the general population lives longer, the perioperative physician is more likely to encounter disease states that increase in incidence in an aging population. This review focuses on anesthetic considerations for rational drug choices during the perioperative care of elderly patients. The primary aim of the review was to identify intraoperative and postanesthetic considerations for diseases associated with advancing age; it includes highlights of the commonly impaired major organs (eg, cardiovascular, pulmonary, neurologic, renal, hepatic systems). We also outline an approach to frequent issues that arise in the immediate postsurgical period while caring for these patients.

Methods: A systematic review was performed on aspects of the perioperative and postoperative periods that relate to the elderly. A list of pertinent key words was derived from the authors, and a PubMed database search was performed.

Findings: The anesthesiologist must account for changes in various organ systems that affect perioperative care, including the cardiovascular, pulmonary, renal, hepatic, and central nervous systems. The pharmacokinetic principles frequently differ and are often unpredictable because of anatomic changes and decreased renal and hepatic function. The most important pharmacodynamic consideration is that elderly patients tend to exhibit an exaggerated hypoactivity after anesthesia.

Implications: Before surgery, it is essential to identify those patients at risk for delirium and other commonly encountered postanesthesia scenarios. Failure to manage these conditions appropriately can lead to an escalation of care and prolonged hospitalization. (*Clin Ther*. 2015;▮:▮▮▮–▮▮▮) © 2015 Published by Elsevier HS Journals, Inc.

Key words: elderly, recovery, delirium, polypharmacy, anesthesia, surgery.

INTRODUCTION

As the general population lives longer, the perioperative physician is more likely to encounter disease states that increase in incidence in an aging population. The preoperative evaluation of elderly patients undergoing surgery is considered elsewhere. The primary aim of the present review was to identify intraoperative and postanesthetic considerations for diseases associated with advancing age; it includes highlights of the commonly impaired major organs (eg, cardiovascular, pulmonary, neurologic, renal, hepatic systems). We also outline frequent issues that arise in the immediate postsurgical period in these patients. Finally, we present our anesthetic techniques that may be of clinical benefit for surgeries and procedures often performed in the elderly population.

MATERIALS AND METHODS

Although most clinical research involves an arbitrary age threshold at which one is considered to be aged or elderly, most practitioners understand that there is great heterogeneity in co-morbid conditions, disease severity, and functional independence among patients who are aged >60 years. Although the literature search was not limited to a particular age range, the National Library of Medicine notes elderly (or aged) as a person aged 65 through 79 years (Medical Subject Headings Descriptor Data).

We performed a systematic review of aspects of the perioperative and postoperative period that relate to the elderly. A list of pertinent key words was derived from the authors, and a PubMed database search was performed. Search terms (Medical Subject Headings)

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were: (((Elderly) OR (Aged, 80 and Over)) AND ((Surgery) OR (Anesthesia) OR (PACU) OR (Recovery))) AND (keyword). The key words used were as follows: complications, myocardial infarction, stroke, delirium, anemia, COPD, diabetes, dysphagia, hip fracture, hypotension, hypertension, dementia, POCD, sleep, cancer, polypharmacy, endocrine, pain, nausea, vomiting, and hypothermia. The focus was on recently published, highly cited, randomized controlled trials, human studies, translational animal models, articles pertaining to the perioperative period, and reporting of adverse outcomes. Articles in languages other than English were excluded from the search.

ANESTHETIC CONSIDERATIONS FOR DISEASES THAT INCREASE IN PREVALENCE WITH AGE

Cardiovascular Disease

The lifetime risk of developing coronary artery disease after 40 years of age is 49% for men and 32% for women.[1] Preoperative risk stratification is well outlined by the American Heart Association guidelines, and we refer to this document for preoperative consideration. In patients of any age with coronary artery disease, a key anesthetic goal is maintenance of the balance between oxygen supply and demand in the perioperative period. Although hypertension (increased cardiac work) and hypotension (decreased coronary blood flow) can negatively affect patients with coronary artery disease, tachycardia (increased work and decreased coronary filling time) has the greatest adverse effect. The 2014 American Heart Association guidelines on perioperative evaluation and management recommend continuing β-blocker therapy in the perioperative period.[2] Acute withdrawal of β-blockade was shown to increase both 30-day and 1-year mortality.[3] Although initiating β-blocker therapy on the day of surgery is associated with a decreased incidence of perioperative myocardial infarction, there is a subsequent increase in the risk of death and stroke.[4] Intraoperative hypotension in 2 different studies was found to be an independent risk factor for major cardiac events in noncardiac surgery.[5,6] The study by Sabate et al[5] specifically defines intraoperative hypotension as a >20 mm Hg decrease or a drop of 20% in mean arterial pressure lasting for >1 hour. Given these results, keeping the mean arterial pressure within 20% of baseline would be recommended. The accompanying table summarizes anesthetic considerations for specific cases commonly encountered in the elderly population.

Atrial fibrillation also increases in frequency with age. Five percent of patients aged >70 years have a diagnosis of atrial fibrillation, and it is increased to 10% in patients aged >80 years.[7] Patients with chronic atrial fibrillation do not require additional evaluation before surgery if their heart rate is pharmacologically controlled at <80 beats/min.[8] The 2014 American Heart Association guidelines on perioperative management recommend no changes in medication management under these circumstances.[2] Age reduces arterial compliance; recently, the role of atrial stretch in arrhythmogenesis has received much scientific attention.[9,10] This focus has prompted clinicians to carefully consider fluid strategies when managing patients at risk for developing atrial fibrillation, especially during cardiac surgery.[11] Despite the potential risk of abnormal atrial stretch leading to new-onset atrial fibrillation, no fluid strategy is currently recommended for the prevention of atrial fibrillation. In addition, no recommendations can currently be made for the fluid management of patients undergoing surgery who have existing long-standing or paroxysmal atrial fibrillation.

Historically, inhaled anesthetics (halothane and nitrous oxide) dominated the anesthesia market as potent, nonflammable agents suitable for a wide variety of surgeries. However, their use has declined somewhat with the introduction of newer volatile agents (sevoflurane, isoflurane, and desflurane) with more favorable cardiovascular profiles. Halothane (no longer in use in the United States) has been considered to increase the risk of arrhythmias,[12] and nitrous oxide may increase the incidence of myocardial infarction even without a significant increase in the risk of morbidity from that infarction.[13] Although cardiac arrhythmias and perioperative myocardial infarction are still identified and treated, much of the cardiovascular concerns have shifted toward avoiding perioperative hypotension in patients to preserve cerebral perfusion.

The prevalence of hypertension in adults aged ≥ 60 years is 66.7%.[1] A meta-analysis of 30 observational studies examining perioperative cardiac risk reported no significant increase in this condition in patients with preoperative arterial pressures of $<180/110$ mm Hg.[14] A study in the *Canadian Journal of Anesthesia*