ELDERLY PATIENTS WITH CARDIOVASCULAR DISEASE: AN OVERVIEW OF PERIOPERATIVE MANAGEMENT

An essay
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مرضى القلب والأوعية الدموية المسنين: نظرة شاملة على معالجتهم فى أوقات ما حول العملية

رسالة

توطئة للحصول على درجة الماجستير فى التخدير

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Summary

The number of elderly patients in the population is increasing and the incidence of cardiovascular disease is also on the increase. So, the likelihood of elderly patients with cardiovascular disease undergoing anesthesia and surgery is being greater.

The mechanisms that control aging process remain unknown; the elderly patients may show normal physiological changes in different systems that accompany aging. Two important principles must be kept in mind when discussing the physiology of aging. First, aging is associated with a progressive loss of functional reserve in all organ systems. Second, the extent and onset of these changes are highly variable from person to person. Although aging affects all systems of the body, the most important effects with regard to anesthesia and surgery are those on cardiovascular, respiratory and renal systems.

In addition to these physiological changes, the elderly patients face risk factors such as past history of myocardial infarction; ischemic heart disease; history of congestive cardiac failure or arterial hypertension.

Elderly patients with cardiac disease are likely to be receiving one or more co-medications (e.g., aspirin, β blockers, nitrates, calcium antagonists, diuretics, digoxin, ACE

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قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا
إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ

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ACE : Angiotensin- Converting Enzyme

ACEI : Angiotensin converting enzyme inhibitor.

AF : Atrial Fibrillation

AFL : Arial Flutter

AGP : α1-Acid Glycoprotein

ARBs : Angiotensin II receptor blockers.

ASA : American Society of Anesthesiologists

AV : Atrioventricular

AVNRT : Atrioventricular Nodal Reentrant Tachycardia

AVRT : Atrioventricular Reentrant Tachycardia

BAFTA : Birmingham Atrial Fibrillation Treatment of the Aged Study

BBs : β- Blockers.

BNP : B-Type Natriuretic Peptide

CAD : Coronary Artery Disease

CCBs : Calcium channel blockers.

CHF : Congestive heart failure.

CK : Creatine kinase

CNS : Central Nervous System

COPD : Chronic Obstructive Pulmonary Disease

CSF **:** Cerebrospinal fluid.

cTnI **:** Cardiac Troponin I

DBP **:** Diastolic blood pressure.

Do2 **:** Systemic oxygen delivery.

ECG **:** Electrocardiogram

EEG **:** Electroencephalography

$GABA_A$ **:** δ-Amino Butyric Acid

GFR **:** Glomerular Filtration Rate

HCTZ **:** Hydrochlorothiazide

HMG-CoA **:** Hydroxymethylglutaryl Coenzyme A

HTN **:** Hypertension

INR **:** International Normalized Ratio

ISH **:** Isolated Systolic Hypertension

JNC **:** Joint National Committee

MAC **:** Minimal Alveolar Concentration

NO **:** Nitric oxide.

NSAIDS **:** Non -Steroidal Anti-Inflammatory Drugs

PACU **:** Post Anesthesia Care Unit

PEEP **:** Positive end- expiratory pressure.

POCD **:** Post Operative Cognitive Dysfunction

POMI **:** Perioperative Myocardial Infarction

RAAS **:** The renin-angiotensin-aldosterone system.

RAS **:** The rennin angiotensin system.

RCRI **:** Revised cardiac risk index.

ROS **:** Reactive Oxygen Species

RPF **:** Renal Plasma Flow

SBP **:** Systolic blood pressure.

SPECT **:** Single-Photon-Emission Computed Tomography Study.

SVT **:** Supraventricular tachycardia.

TURP **:** Transurethral Resection of the Prostate

V/Q **:** Ventilation Perfusion Ratio

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Introduction

Perioperative management of geriatric surgical patients is an important component of anesthetic practice because the population segment with the fastest growth is people 65 years and older.

Age-related changes in physiology can affect every aspect of perioperative care. Respiratory, cardiovascular and renal physiological reserves are diminished by aging. Moreover, polypharmacy in conjunction with changes in pharmacokinetics and pharmacodynamics may strikingly modify the sensitivity of the elderly to anesthetics and analgesics ***(Cohendy et al, 2005).***

Cardiovascular morbidity and mortality in the elderly patients has been determined to be the main contributor in cases of overall adverse perioperative outcome ***(Mangano, 1990).***

Coupled with the increased prevalence of ischemic heart disease in the elderly, there are a number of important risk factors for the coexistence of cardiac disease such as arterial hypertension, smoking, hyperlipidemia and diabetes mellitus. A number of strategies have been examined to reduce these adverse outcomes ***(Kannal & Vokonas, 1992).***

The role of anesthesiologists and perioperative physicians is focused on stabilization and optimization of preoperative medical condition, selection of appropriate intraoperative anesthetic techniques and management, stabilization of other immediate postoperative conditions, and management of postoperative pain ***(Schein et al., 2000).***

Chapter (1)

Statistical and Demographic Data

In many developed countries the population is becoming older, thanks to improvements in health care. The oldest of the elderly, which is the group most likely to need medical care, is the fastest growing segment of the population ***(US Bureau of Census, 1993)***.

In Western countries approximately 14% of the population is aged 65 years or older ***(Hall, 1997)***.

In recent decades life expectancy in the USA and Europe has been prolonged in men and women to approximately 74 years and 80 years, respectively. Many factors contribute to this development, but medical progress seems to be the most effective one ***(Schneider, 1999).***

In 1998, European inhabitants aged 65 and older represent 15-19% of the population. It is estimated for the year 2025 that this group will grow to over 20% of the population in Europe, Canada and Japan ***(World Health Organization, 1998).***

In 2000, elderly surgical patients received 20% or more of all surgical procedures in acute care hospitals across the country ***(Bailes, 2000)***. During the past two decades, progress in both surgical and anesthetic techniques lowered the overall