

牙科麻醉學
Dental anesthesiology

Anesthesia and Co-existing Diseases

馬偕紀念醫院 麻醉科
黃俊仁
cjhuang@tmu.edu.tw



Dept. of Anesthesiology, Mackay Memorial Hospital

2009/04/13

學習目標

- 正確評估口腔疼痛問題及行為管理
- 全身性潛在疾病併發之處理及預防

資料來源

1. Handbook of local anesthesia Stanley F. Mclamed 1997 4th ed. Mosby
2. Handbook of local anesthesia Stanley F. Mclamed 1995 3th ed. Mosby 3. Sediton

Hypertension

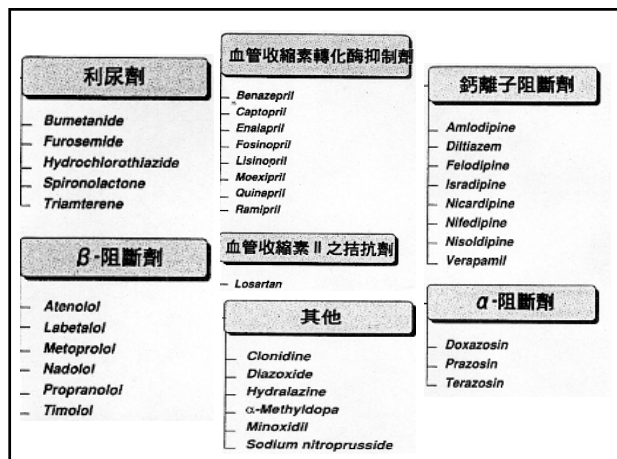
- Affect 1 billion people globally
 - Account for 7 million death per year
- Isolated systolic hypertension
 - The most common subtype of hypertension (> 50 y/o)
 - Greater risk of fatal and non-fatal stroke and CAD
- Diastolic hypertension
 - Microvascular pathology (< 40 y/o)
 - Important marker for cardiovascular outcomes
- Hypertension combines with target organ damages (ischemic heart disease, heart failure, renal, cerebrovascular diseases, etc.)
 - ↑ Risk of perioperative cardiac complications

Classification of Hypertension

Category	SBP	AND	DBP
Optimal	<120	AND	<80
Normal	<130	AND	<85
High normal	130-139	OR	85-89
Mild hypertension	140-159	OR	90-99
Moderate	160-179	OR	100-109
Severe	>180	OR	>110
Isolated SBP hypertension	>140	AND	<90
Pulse pressure	>65		
Orthostatic changes	Hyper response >20		Hypo response <20

Treatment of Hypertension

- Treatment BP target: SBP/DBP < 140/90 mm Hg
 - Lower BP target in cases with diabetes or renal disease
 - More aggressive treatment of isolated systolic hypertension
- Lifestyle modification
- Pharmacological therapy
 - Diuretics
 - Angiotensin-converting enzyme inhibitor (ACEI)
 - Angiotensin II receptor antagonist (ARAs)
 - β -adrenergic receptor antagonists (β -blockers)
 - Ca^{2+} -channel blockers
 - α_2 -adrenergic receptor agonists (α_2 -agonists)



Anesthetic Management of Hypertensive Patients

- Maintain hemodynamic stable
 - Keep MBP fluctuation of < 20%
- Continue pharmacological therapy (except ACEI/ARA)
 - Switch to parenteral route for drug administration
 - Rebound hypertension: β -blockers, α_2 -agonists
- Perioperative pharmacological interventions
 - If MBP increase > 20%:
 - Antihypertensive agents:
 - β -blockers; α_2 -agonists; Ca^{2+} -channel blockers; Nitrates
 - If MBP decrease > 20%:
 - Vessel constrictor: α_1 -agonists, mixed α & β agonists(+)
 - (+) Inotropic/chronotropic agents:
 - β_1 -agonists, dopamine, etc.

Anesthetic Choice

- Regional anesthesia: significant hypotensive effects
 - Stress reduction; decrease sympathetic tone; \downarrow SVR
 - Fluid supplement; vaso-active drugs
- General anesthesia: Myocardial depression/vasodilatation
 - Intravenous and inhalational anesthetic agents
 - Fluid supplement
- Combined general and regional anesthesia
- Adequate analgesia:
 - Narcotic agents, NSAIDs
- Post-operative management:
 - Adequate analgesia: PCA
 - Restore antihypertensive agents



Diabetes Mellitus

- At least 171 million people worldwide suffer from diabetes
- Type I diabetes: Insulin-dependent (IDDM)
 - Autoimmune destruction of the pancreatic beta cells
 - Therapy: Insulin
- Type II diabetes: Non-insulin dependent (NIDDM)
 - Insulin resistance in target tissues
 - Therapy: diet, exercise, life style modification, oral diabetic drugs, insulin

Complications of Diabetes Mellitus

- Atherosclerosis
 - Macrovascular disease
 - Microvascular disease
 - Endothelial dysfunction
- Hypertension
 - Impaired cerebral autoregulation
 - Renal dysfunction
- Nephropathy
 - Renal dysfunction
 - Hypertension
- Autonomic neuropathy
 - Delayed gastric emptying
 - Orthostatic hypotension
 - Abnormal cardiac reflexes
- Sensory neuropathy
 - Joint immobility
 - Difficult laryngoscopy
- Retinopathy

Hyperglycemic Crises

- Diabetic ketoacidosis
 - Hyperglycemia
 - Ketonemia
 - Acidosis
 - Typically type 1 diabetics
 - Mortality 3-5%
- Hyperosmolar hyperglycemic state
 - Hyperglycemia
 - Hyperosmolarity
 - Neurologic dysfunction (coma)
 - No acidosis
 - Typically type 2 diabetics
 - Mortality > 15%

Anesthetic Management of Diabetic Patients

- Preoperative evaluation:
 - End organ damage; antidiabetic medication; glucose level
- Intraoperative glucose regulation: target glucose level 80-200 mg/dL
 - Frequent glucose measurements (q30 min)
 - Rapid changes in glucose and insulin infusion rates
- Insulin infusion rates: ↓ glucose level by 25-30 mg/dL per unit
 - Start from 0.5-1 units/h
 - Increase by 0.3-0.5 units/h if BS > 180 mg/dL
 - Stop insulin infusion if BS < 80 mg/dL
- Hypokalemia
- Rapid reduction of glucose level: ↑ risk of cerebral edema

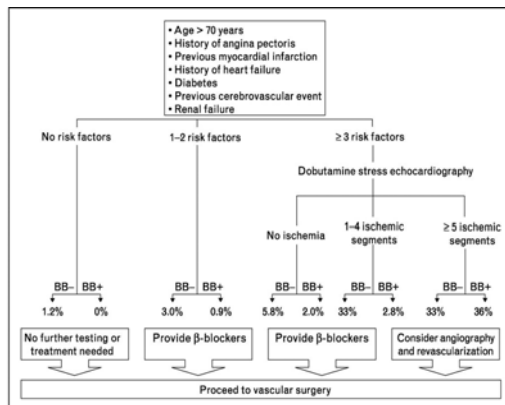
Anesthetic Choice

- Regional anesthesia:
 - Contra-indications: systemic anticoagulation, infection at injection site, peripheral neuropathy (?)
- General anesthesia:
 - Avoid/minimize adverse effects of anesthetic agents on end organs
 - Adjunctive drugs: β -blockers, antihypertensive agents
 - Laryngoscopy and tracheal intubation
 - Expect difficult airway, LMA
- Combined general and regional anesthesia
- Stress reduction; adequate perioperative analgesia
- Resume oral intake as soon as possible after surgery



Ischemic Heart Disease (IHD)

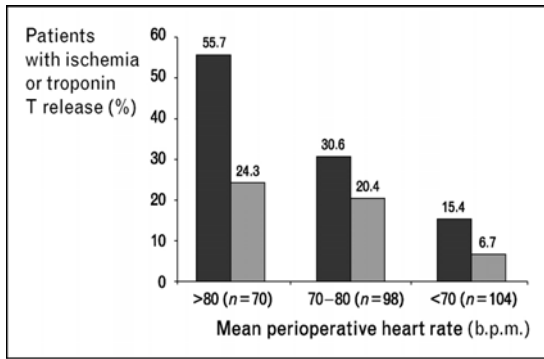
- Coronary artery disease (CAD)
- The most common cause of sudden death
 - Leading cause of death in USA
- S/S: angina pectoris; stable angina, unstable angina
- Imbalance between myocardial oxygen demand and supply
 - Myocardial oxygen demand:
 - HR, contractility, systemic vascular resistance
 - Myocardial oxygen supply:
 - Coronary artery filling time/pressure
- Therapy:
 - Nitrates; β -blockers; anti-arrhythmic agents
 - anti-platelet agents; anti-hypertensive agents



BB, β -blockers. The proportions are the incidence of cardiac death or myocardial infarction. Derived from Boersma et al. [11].

Anesthetic Management of Patients with IHD

- Preoperative evaluation:
 - Myocardial ischemic condition:
 - postpone elective surgeries in unstable cases
 - Current medication:
 - Cardiac condition: echocardiography; heart failure; arrhythmia
 - Coagulation condition: bleeding time
- Continue pharmacological therapy: anti-platelet agents (?)
- Invasive hemodynamic monitors:
 - A-line, CVP, PA catheter, Cardiac output monitor
- Maintain hemodynamic stability
- Avoid tachycardia



Derived from Feringa *et al.* [47**].

Anesthetic Choice

- Regional anesthesia: better stress reduction
 - Peripheral vascular dilatation: hypotension, reflex tachycardia
 - Fluid supplement
 - ↑ Venous return: pharmacological or non-pharmacological
 - Contra-indications: systemic anticoagulation
- General anesthesia:
 - Avoid/minimize myocardial depression effects of anesthetics
- Combined general and regional anesthesia
- Stress reduction; adequate perioperative analgesia
- Postoperative monitoring

Summary

- Introduction of dental anesthesiology
- Pharmacology of local anesthetic and Clinical Notes in Local Anesthesia
- Peri-op management of anesthesia
- General Anesthesia and Sedation
- Anesthesia and Co-existing Diseases
- ACLS and Airway Management
- ACLS
- Local Anesthesia In Dentistry
- 身心障礙者之門診麻醉 sedation in dentistry

