

December 2007 DAC Answers

Tuesday, December 18, 2007

What are the clinical relevant differences between cerebral salt-wasting syndrome (CSWS) and syndrome of inappropriate antidiuretic hormone secretion (SIADH) ?

Despite outward similarities, the pathophysiology, biochemistry, and treatment of these two conditions are very different. In SIADH there is renal conservation of water and dilutional hyponatraemia. Cerebral salt wasting syndrome is defined as a natriuresis with sodium and water loss and a decrease in intravascular volume. As a result, SIADH is treated by fluid restriction and cerebral salt wasting responds to sodium and water replacement. Clinical variables that differentiate the 2 syndromes are listed as follows:

	CSW	SIADH
Weight	↓	↑
CVP	↓*	↑or N
Postural hypotension	+	-
Serum osmolality	↑or N	↓
Serum uric acid	N	↓
Plasma urea	N or ↑	↓or N
PCV	↑	↓or N
Urine sodium	↑↑	↑
Urine volume	↑↑	↓or N

Reference:

Harrigan M. Cerebral Salt Wasting Syndrome: A Review. Neurosurgery. 38(1):152-160, January 1996

Monday, December 17, 2007

What is the distinction between postoperative delirium and postoperative cognitive dysfunction?

One of the principal distinctions between postoperative (Post-Op) delirium and postoperative cognitive dysfunction (POCD) is the time frame in which they are found.

Emergence delirium occurs in the operating room (OR) or immediately after in the postanesthesia care unit (PACU). Postoperative delirium occurs 24–72 h after surgery. POCD is measured at weeks to months after surgery and anesthesia.

Reference:

Silverstein J et al. Central Nervous System Dysfunction after Noncardiac Surgery and Anesthesia in the Elderly. *Anesthesiology* Volume 106(3), March 2007, pp 622-628

2. Cerebral salt-wasting syndrome:dx
3. Celiac plexus block complications
4. Mivacurium:drug induced prolongation
5. Coagulopathy in transfusions

Friday, December 14, 2007

“A normal PaCO₂ in a patient with an asthmatic attack is a good sign.”
Is this true or false?

It depends! A normal PaCO₂ in an asthmatic is a good sign if the patient is feeling symptomatically improved with less dyspnea. However, it can be a sign of impending respiratory failure if the patient continues to feel dyspneic or exhausted. This is especially true if the patient was previously hypocapnic.
Laboratory results are not a substitute for clinical exam.

Reference:

K. Roberson and D. Lubarsky. *Anesthesiology – Critical Care* 2001; 100-103.

Thursday, December 13, 2007

A 45-year-old obese male presents with dyspnea, peripheral edema, snoring, and excessive daytime sleepiness. On a room air arterial blood gas is drawn and the Ph is 7.34, Pa CO₂ 60 mmHg, PaO₂ 58 mmHg, calculated HCO₃ is 28 mEq/l. What is the acid base disturbance?

The patient has a chronic compensated respiratory acidosis. If this were acute, the pH would be 7.24 with a normal HCO₃.

DAC, December 12, 2007

What is baroreceptor reflex?

Increases in blood pressure stimulate peripheral baroreceptors located at the bifurcation of the common carotid arteries and aortic arch. These baroreceptors then send afferent

signals to the brain stem circulatory centers via the glossopharyngeal and vagus nerves allowing an increase in vagal tone and consequently vasodilatation and decrease in heart rate.

Friday, December 7, 2007

5. Your patient is scheduled for thoracotomy for right upper lobe lung carcinoma. The patient did an internet search on postoperative pain control and he found that a large number of patients undergoing this procedure, still experience pain at 6 months after the surgery. The patient asks you why this persistent pain happens, and what can be done in his case to make it less likely to occur. What is your response?

The persistent pain after thoracotomy is very common (67% at or beyond 6 months). The pathophysiological mechanisms are still to be determined although the underlying process seems to be one of “sensitization” of the nervous system, either peripherally or centrally. There have been recognized several predisposing factors such as: severity of pre and postoperative pain, intraoperative nerve injury, depression and anxiety. The severity of acute pain in particular seems to be very important and so much attention has focused on determining optimal techniques perioperatively. In this regard, epidural analgesia is far superior to any form of systemic analgesia and this remains the technique of choice, although paravertebral block is proven its value. A recent metaanalysis did not find “preemptive” epidural analgesia to be significantly better than epidural block established after surgery had commenced, however there were few studies reviewed. In addition, a multimodal approach of perioperative pain control is advisable, including NSAIDS, antidepressants and gabapentin, proved their efficacy in small trials.

Reference:

1. Solak, O et al. Effectiveness of Gabapentin in treatment of chronic post-thoracotomy pain control. *Eur J Cardio-Thorac Surg* 32: 9-12, 2007
2. R. G. Davies et al. A comparison of the analgesic efficacy and side-effects of paravertebral vs epidural blockade for thoracotomy—a systematic review and meta-analysis of randomized trials; *British Journal of Anaesthesia* 2006 96(4):418-426

Thursday, December 6, 2007

What level of spinal or epidural blockade is required to suppress the vasoconstrictor response to sympathetic stimulation that results in a reduction in renal blood flow and GFR?

Neuraxial blockade from the level of T4 to T10 is required as renal vasoconstrictor fibers are derived from T4 to L1 spinal cord segments through celiac plexus.

Wednesday, December 5, 2007

What are the characteristics of the flow-volume loop in a case of variable extrathoracic obstruction? What are the frequent causes of extrathoracic obstruction?

Variable extrathoracic lesions are caused by vocal cord neoplasms, neoplasms of the neck, or vocal cord paralysis. The inspiratory limb of the flow-volume loop has a plateau. During inspiration, the generation of negative intrathoracic pressure pulls the extrathoracic airway closed. During exhalation airflow maintains the patency of the airway.

Tuesday, December 4, 2007

What are the factors that govern CO production resulted from degradation of volatile anesthetics?

The factors that govern CO production include:

- 1) The anesthetic used: for a given minimum alveolar anesthetic concentration (MAC)-multiple, the magnitude of CO production (greatest to least) is desflurane > or = enflurane > isoflurane >> halothane = sevoflurane.
- 2) The absorbent dryness: completely dry soda lime produces much more CO than absorbent with just 1.4% water content, and soda lime containing 4.8% or more water (standard soda lime contains 15% water) generates no CO.
- 3) The type of absorbent: at a given water content, Baralyme produces more CO than does soda lime.
- 4) The temperature: an increased temperature increases CO production.
- 5) The anesthetic concentration: more CO is produced from higher anesthetic concentrations.

Reference:

Eger EI, et al. Carbon monoxide production from degradation of desflurane, enflurane, isoflurane, halothane, and sevoflurane by soda lime and Baralyme. *Anesthesia & Analgesia*, 1995; Vol 80, 1187-1193.

Monday, December 03, 2007

What happens to the pH as PaCO₂ increases by 10 mmHg?

As the PaCO₂ increases by 10 mmHg, the pH falls by 0.08 to 0.1 units.