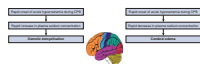


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BRAIN AND THE RAPID ONSET OF HYPONATREMIA



DURING CARDIOPULMONARY BYPASS

To the Editor:

During cardiac surgery, serum sodium levels decrease rapidly when cardiopulmonary bypass (CPB) is initiated because CPB causes hemodilution.¹ The balance of water in the body is regulated by plasma osmolarity: Increased plasma osmolarity (hypertonicity) is sensed by osmoreceptors in the hypothalamus that regulate both antidiuretic hormone release and thirst. Serum sodium concentration (natremia) reflects water balance.² There are several potential mechanisms by which hyponatremia may be associated with postoperative stroke. First, central nervous system osmotic swelling may result from an acute decrease in serum sodium levels during CPB. Acute swelling may disrupt the myelin sheath and cause neuronal rupture. Second, acute swelling may result in increased intracranial pressure and decreased cerebral perfusion pressure. Third, levels less than 130 mEq/L during CPB resulted in a postoperative stroke and neurologic deficits in patients within 2 days of

surgery, which suggests an acute insult. It is important to note that although data regarding the effects of hyponatremia during CPB with respect to human neurologic injury are currently lacking, the current study's findings are significant in that sodium levels of less than 130 mEq/L are not uncommon during CPB. Therefore, a simple method of preventing hyponatremia during CPB is to avoid using low-sodium lactated Ringer's pump prime solution, especially in patients with preoperative hyponatremia. Thus, using a balanced priming solution with retrograde autologous priming techniques may be ideal in patients with preoperative hyponatremia. Moreover, intraoperative hyponatremia and hypernatremia during CPB may need to be treated quickly and properly.

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