Postoperative hyponatremia

Most hospitalized hyponatremic patients are asymptomatic, euvolemic, and have measurable vasopressin levels[16]. Postoperative hyponatremia occurs mainly in the setting of infusion of excessive amounts of electrolyte-free water (hypotonic saline or 5% dextrose in water) and the presence of vasopressin, which prevents the excretion of this electrolyte-free water. Hyponatremia can also occur in the postoperative setting despite near-isotonic saline infusion within 24 h of induction of anesthesia. This occurs mostly through the generation of electrolyte-free water by the kidneys in the presence of vasopressin[17]. In a small subgroup of young females, hyponatremia is accompanied by cerebral edema, leading to seizures and hypoxia with catastrophic neurologic events, particularly after gynecologic surgery.

Drugs causing hyponatremia

Drug-induced hyponatremia is mediated by vasopressin analogs such as desmopressin (DDAVP: deamino-D-arginine-vasopressin), drugs that enhance vasopressin release, or by agents potentiating the action of vasopressin. In other instances, the mechanism is unknown (Table 8.3).

Vasopressin analogs	Drugs that potentiate renal action of vasopressin
Desmopressin (DDAVP)	Chlorpropamide
Oxytocin	Cyclophosphamide
Drugs that enhance vasopressin release	Nonsteroidal anti-inflammatory agents
Chlorpropamide	Acetaminophen (paracetamol)
Clofibrate	**Drugs that cause hyponatremia by unknown mechanisms**
Carbamazepine–oxycarbazepine	*Haloperidol*
Vincristine	Fluphenazine
Nicotine	Amitriptyline
Narcotics	Thioradazine
Antipsychotics/antidepressants	Fluoxetine
Ifosfamide	*Metamphetamine (MDMA or Ecstacy)*
	Sertraline

*Not including diuretics
Modified with permission from Veis and Berl[19]
Italics: The common causes

Table 8.3 Drugs associated with hyponatremia.

Syndrome of inappropriate vasopressin secretion

Despite being the most common cause of hyponatremia in hospitalized patients, the syndrome of inappropriate vasopressin (ADH) secretion (SIADH) is a diagnosis of exclusion. It is characterized by a defect in osmoregulation of vasopressin. For the degree of hypotonicity, the plasma vasopressin levels are inappropriately stimulated, leading to urinary concentration. The more common causes of this syndrome are listed in Table 8.4.

Causes of the syndrome of inappropriate vasopressin release (SIADH)			
Carcinomas	**Pulmonary disorders**	**Nervous system disorders**	**Other**
Bronchogenic carcinoma	*Viral pneumonia*	*Encephalitis (viral or bacterial)*	*AIDS–HIV*
Carcinoma of the duodenum	*Bacterial pneumonia*	*Meningitis (viral, bacterial, tuberculous, and fungal)*	*Idiopathic (elderly)*
Carcinoma of the pancreas	*Pulmonary abscess*	*Head trauma*	Prolonged exercise
Thymoma	*Tuberculosis*	*Brain abscess*	
Carcinoma of the stomach	Aspergillosis	*Brain tumors*	
Lymphoma	Positive pressure breathing	Guillain–Barré syndrome	
Ewing's sarcoma	Asthma	Acute intermittent porphyria	
Carcinoma of the bladder	Pneumothorax	Subarachnoid hemorrhage or subdural hematoma	
Prostatic carcinoma	Mesothelioma	Cerebellar and cerebral atrophy	
Oropharyngeal tumor	Cystic fibrosis	Cavernous sinus thrombosis	
Carcinoma of the ureter		Neonatal hypoxia	
		Hydrocephalus	
		Shy–Drager syndrome	
		Rocky Mountain spotted fever	
		Delirium tremens	
		Cerebrovascular accident (cerebral thrombosis or hemorrhage)	
		Acute psychosis	
		Peripheral neuropathy	
		Multiple sclerosis	

With permission from Berl and Schrier[20]
Italics: the common causes.

Table 8.4 Causes of the syndrome of inappropriate vasopressin release (SIADH).