



October 2017

ELDER CARE

A Resource for Interprofessional Providers

Hyponatremia in Older Adults – Therapeutic Considerations

Sangeetha Murugapandian, MD and Bijin Thajudeen, MD, Department of Medicine, University of Arizona college of Medicine

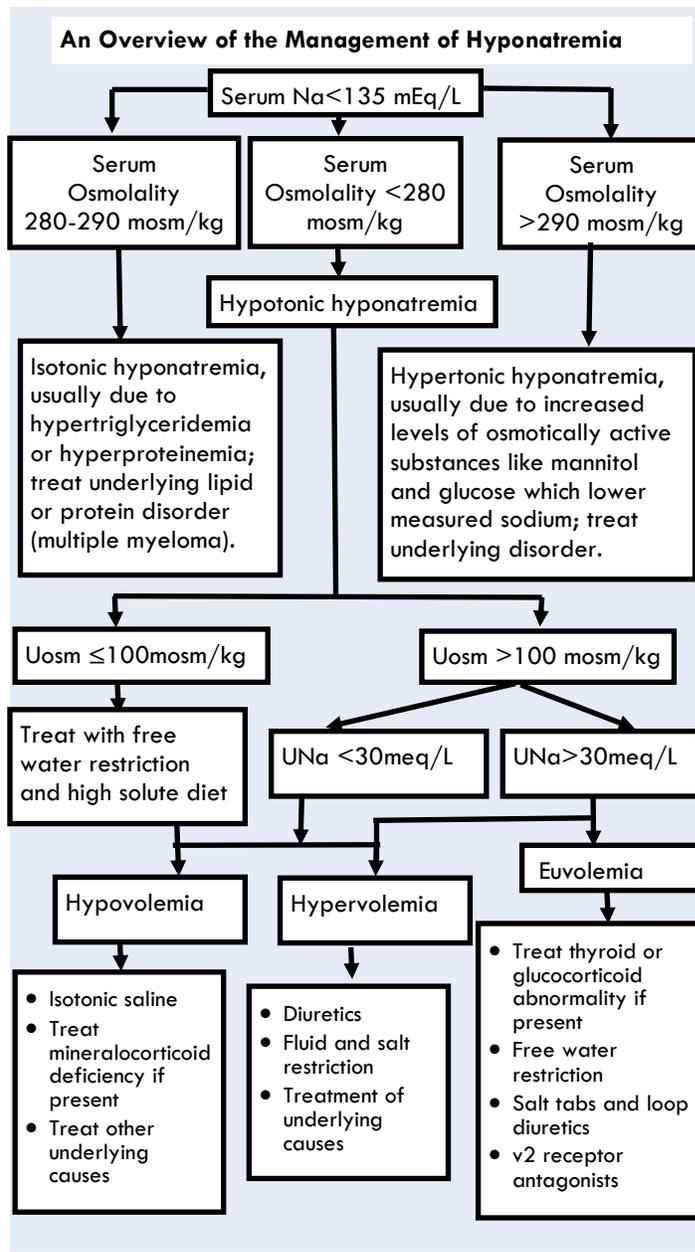
The diagnostic evaluation of hyponatremia in older adults is reviewed in another edition of Elder Care (see references and resources). This edition focuses on treatment.

The general treatment principles are shown in Table 1 and the algorithm at right outlines the key steps in treatment. More detailed information about special issues in treating hyponatremia in older adults is provided on page 2.

As noted in Table 1, an important part of treatment is to reverse the underlying condition causing hyponatremia. In many cases, the condition is caused by medications taken by older adults, such as thiazide diuretics, antipsychotics, and antidepressants which put them under increased risk. A key step in treating hyponatremia is thus stopping or reducing the dose of these drugs whenever possible.

Note also some of the treatments discussed on page 2 involve changes in dietary habits or fluid consumption that may be difficult for older adults. Referral to a dietician may be helpful with this aspect of treatment.

Table 1. General Principles for Treating Hyponatremia
<ul style="list-style-type: none"> Hyponatremia signifies an underlying pathology that needs to be identified and treated. When hyponatremia develops slowly and has been present chronically, older patients often have few or no symptoms. Correction of serum sodium levels must not be increased more than 6mEq/L per 24 hours due to risk of osmotic demyelination. Older adults with chronic hyponatremia and/or malnutrition are at increased risk of this complication. Patients with acute symptomatic hyponatremia should be treated in the hospital, irrespective of sodium levels. Treatment involves infusion of hypertonic saline, and it requires careful monitoring. Infusion of isotonic saline and use of diuretics to treat hyponatremia has to be done with caution in older adults, as they are prone both to volume overload and volume depletion.



TIPS FOR TREATING HYPONATREMIA IN OLDER ADULTS

- The initial step in the managing hyponatremia involves elucidating the cause, and reversing that cause if possible.
- Isotonic saline and diuretics must be used with caution in older adults; requires careful inpatient monitoring to avoid fluid overload.
- Correction of serum sodium depends on how long hyponatremia has been present. Acute hyponatremia with severe symptoms has usually developed rapidly even if hyponatremia is mild, and requires more rapid correction. Long-standing hyponatremia without severe symptoms must be corrected more slowly - not more than 6mEq/L in 24 hours to avoid osmotic demyelination syndrome.

ELDER CARE

Continued from front page

Treating Hypotonic Hyponatremia With Urine Osmolality <100 mOsm/kg

Hypotonic hyponatremia with decreased urine osmolality is classically seen in patients with psychogenic polydipsia and beer potomania. But, it also occurs in older adults who have difficulty preparing foods and gradually cut back on food variety until they are eating a simple “tea and toast” diet, which contains inadequate sodium.

Free water restriction is the mainstay of treatment for all of these low-osmolality conditions, but it can be difficult for older adults, whose thirst centers are activated at a lower osmolality levels than in younger individuals. Sodium intake should not be limited but rather increased; patients need high solute (sodium intake) to help with free water excretion. Reset osmostat is another condition seen in older adults who have pulmonary diseases in which regulation of anti-diuretic hormone takes place at lower osmolal threshold than normal. These patients have lower normal serum sodium levels that cannot be raised.

Treating Hypotonic Hyponatremia With Urine Osmolality >100mOsm/kg and Urine Sodium <30 mEq/L

If the patient is hypovolemic on exam, hyponatremia is typically caused by gastrointestinal fluid losses, pancreatitis, third spacing, or insensible losses. Intravenous fluid replacement is the mainstay of treatment, but in institutionalized older adults, where vascular access is an issue, subcutaneous infusions may be useful.

If the patient is hypervolemic on exam, hyponatremia is likely caused by decreased effective arterial blood volume due to cirrhosis or heart or renal failure. Diuretics are used to correct hyponatremia in these cases, but they risk causing volume depletion in older adults—so the dose of diuretics should be carefully managed based on clinical response.

Treating Hyponatremia When Urine sodium >30mEq/L

If the patient is hypovolemic, hyponatremia is most often caused by diuretics, so a careful medication review is important. Cerebral salt wasting, mineralocorticoid deficiency, and osmotic diuresis are other conditions that can cause hypovolemic hyponatremia. Treatment involves discontinuing offending drugs, administering isotonic saline, and treating any underlying causes.

If the patient is hypervolemic, hyponatremia is caused by acute or chronic renal insufficiency. Treatment involves fluid and water restriction as well as diuretics, plus improving renal function if possible.

If the patient is euvolemic, likely causes include the syndrome of inappropriate antidiuresis (SIAD), hypothyroidism, and glucocorticoid insufficiency. Drugs and other conditions commonly associated with SIAD are listed in Table 2.

Treatment includes discontinuation of offending drugs and treating any underlying conditions that might be contributing to hyponatremia. Free water restriction is helpful when the urine osmolality is not very high. Loop diuretics and salt tablets may be helpful if fluid restriction does not increase the serum sodium. Newer agents like tolvaptan and conivaptan, which are vasopressin receptor antagonists, block the action of vasopressin in the kidneys and help excrete water load, thus improving hyponatremia. However safety and long term effects of these drugs in older adults have not been well established, and thus should be used with caution.

Drugs (examples)	<ul style="list-style-type: none">• Amiodarone• Carbamazepine• Cyclophosphamide• Haloperidol• Opioids• Selective serotonin reuptake inhibitors
Malignancy	<ul style="list-style-type: none">• Small cell lung cancer• Head and neck cancers
Central nervous system disorders	<ul style="list-style-type: none">• Hemorrhage• Infection• Stroke• Trauma
Pulmonary disorders	<ul style="list-style-type: none">• Acute respiratory failure• Atelectasis• Pneumonia
Idiopathic	

References and Resources

- Al Zahrani, Sinnerty R, Gernsheimer J. . Acute kidney Injury, sodium disorders, and hypercalcemia in the aging kidney: diagnostic and therapeutic management strategies in emergency medicine Clin Geriatr Med, 2013; 29:275-319
- Soiza RL, Cumming K, Clarke JM, Wood KM, Myint PK. Hyponatremia: special considerations in older patients. J Clin Med. 2014;3(3):944-958.
- Berl T. An elderly patient with chronic hyponatremia. Clin J Am Soc Nephrol 2013; 8(3):469–475, 2013.
- Koch CA, Fulup T. Clinical aspects of changes in water and sodium homeostasis in the elderly. Rev Endocr Metab Disord. 2017;18:49–66
- Choudhury D, Levi M. Aging and Kidney Disease. In: Skorecki K, Chertow GM, et al. Eds. Brenner and Rector's The Kidney, 24, 727-751. 2016
- Murugapandian S, Thajudeen B. Hyponatremia: Diagnosis. Elder Care. 2017 <http://aging.arizona.edu/program/elder-care-resource-interprofessional-providers>

Interprofessional care improves the outcomes of older adults with complex health problems.

Editors: Mindy Fain, MD; Jane Mohler, NP-c, MPH, PhD; and Barry D. Weiss, MD

Interprofessional Associate Editors: Tracy Carroll, PT, CHT, MPH; David Coon, PhD; Marilyn Gilbert, MS, CHES;

Jeannie Lee, PharmD, BCPS; Linnea Nagel, PA-C, MPAS, Marisa Menchola, PhD; Francisco Moreno, MD; Lisa O'Neill, DBH, MPH; Floribella Redondo; Laura Vitkus, BA

The University of Arizona, PO Box 245069, Tucson, AZ 85724-5069 | (520) 626-5800 | <http://aging.arizona.edu>

Supported by: Donald W. Reynolds Foundation, Arizona Geriatrics Workforce Enhancement Program and the University of Arizona Center on Aging

This project was supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant number U1QHP28721, Arizona Geriatrics Workforce Enhancement Program. This information or content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government.