Suspected Central Diabetes Insipidus Care Guideline

Inclusion Criteria:

- Patients at risk for DI including:
  - s/p trans-sphenoidal resection of mass
  - Acute Brain Injury
  - Hypoxemic insult/vascular injury
  - Neurosurgical procedures involving the brain
  - Meningitis
  - Congenital cysts / masses of the brain involving the hypothalamus, pituitary or infundibulum
  - Cranial tumors
  - Brain malformations
- Patients with pre-existing diagnosis of central DI

Exclusion Criteria:

- Renal failure
- Other causes of polyuria not ruled out:
  - Hyperglycemia
  - Recent diuretic use
  - Barter syndrome
  - Hypercalcemia

Step 1: Establish Diagnosis

Note:
This guideline is designed for neurological post-op patients at risk for development of Central Diabetes Insipidus.

Steps on this page can be utilized to identify patients in acute care areas who may be displaying signs and symptoms of DI.

Criteria for Central DI:

- Serum Na^+ >145
- Urine output >4 mL/kg/hour (<60 kg) or >250 mL/hr (>60 kg) sustained for over 2 hours

Other labs to draw if highly suspecting Central DI:

- Cortisol (if possible wait for 8 AM)
- ACTH
- TSH
- Free T4
- PRL
- Copeptin

Consult Endocrinology for instructions on Hydrocortisone stress dosing after surgery, if indicated

Obtain serum and urine osmolality, urine sodium

*If Na^+ >145 and UOP >4 mL/kg/hr sustained over 2 hours, can proceed to Step 2 while awaiting remaining diagnostic labs

- Serum osmolality >300
- Urine osmolality <300
- Urine Na^+ <40

NO

Consider other differentials:

- Post-op Diuresis
- Hyperglycemia
- Renal failure
- Diuretic use
- 3% saline or mannitol
- Osmotic load

YES

If patient is admitted to Acute Care units, consult Endocrinology.

<u>For ICU Management - Proceed to Step 2</u>: Post-op Management of Central Diabetes Insipidus

Approved Evidence Based Medicine Committee
Original: 5/15/2024

Reassess the appropriateness of Care Guidelines as condition changes and 24 hrs after admission. This guideline is a tool to aid clinical decision making. It is not a standard of care. The physician should deviate from the guideline when clinical judgment so indicates.

Post-op Management of Central Diabetes Insipidus in the PICU

Step 2: Post-op Management of Central Diabetes Insipidus in the PICU

Calculate free water deficit if Na^+ >145
(0.6 x weight (kg) x [(current Na^+ - desired Na^+) / desired Na^+]

- **Start IV fluids at ⅔ maintenance rate (D5NS).** For patients with BMI >95%ile, use ideal body weight.
- **On top of ⅔ maintenance fluids, Y-in fluids with D5 ½ NS to correct free water deficit (FWD).** Run FWD fluids over the next 4-6 hours (can give as **free water** if patient has NG/GT).
- If hypernatremia is suspected to be chronic (>24 hours), replace FWD more slowly, over 12-24 hours.
- Any non-urine losses (e.g. drain output) should be replaced 1:1 and added to free water deficit replacement

Goal Na^+: 140-145

Is the Na^+ level correcting?

YES

- Allow the patient to drink fluids once clinically able and cleared for po by Neurosurgery
- Give IV+PO goal of ⅔ maintenance rate and wean off maintenance fluids as po intake improves

NO

- If Na^+ is **not correcting** after 4-6 hours on Vasopressin gtt and fluids, or at any time rises to >150.
- **If urine output > 3 mL/kg/h: Ensure Vasopressin drip is optimized,** titrating dose to achieve goal UOP. After this, recalculate free water deficit and adjust fluid rate to replace over next 6 hours.
- **If urine output within goal 1-3 mL/kg/h: Recalculate free water deficit and adjust fluid rate** as needed to replace FWD over 6 hours. If Na^+ remains above 150 on subsequent checks, recalculate FWD and adjust fluid rate every 6 hours as needed.

Recommendations for Monitoring

- Check Na^+ q2h for the first 6 hours
- Once Na^+ stable x 3 checks and UOP in goal range, space Na^+ checks out to q4h
- For recurrent polyuria and hypovolemia, check Na^+ q1-2 hours, monitor UOP and volume status every 30 minutes
- Urine output, vital signs, volume status and perfusion: q1h

Please contact Endocrinology with any questions!

Start Vasopressin drip

- Starting dose: 0.01 mU/kg/min
- To reach **goal UOP of 1-3 mL/kg/h**, double dose every 30 minutes until goal UOP achieved

- Continue to titrate Vasopressin by 0.01 mU/kg/min every 30 minutes to maintain UOP 1-3 mL/kg/hour
- **If Na^+ <135,** hold Vasopressin and resume q2h Na^+ checks
- After holding Vasopressin drip, notify Endocrinology if UOP >4 mL/kg/hr for over 2 hours and Na^+ >140, to discuss if a DDAVP dose or resuming Vasopressin is indicated
- Be mindful of **triple phase response:** If hyponatremia persists after holding Vasopressin drip, consider SIADH or CSW

Criteria for transfer to Acute Care:

- Na^+ 135-150
- 12 hours since Vasopressin drip has been discontinued

Discharge Criteria

- Na^+ within goal of 135-150
- No hypovolemia
- Tolerating home feeding regimen

Patient/Family Education

- KidsHealth – A to Z: Diabetes Insipidus, Central
- Pediatric Endocrine Society – Diabetes Insipidus

Pre-existing Central Diabetes Insipidus Care Guideline

If on po DDAVP, tolerating po/GT intake

Na^+ 138-150

No signs of hypovolemia

NO

- Hold home DDAVP until Na^+ >138 and having breakthrough UOP >4 mL/kg/hour
- If NPO and Na^+ in range 138-150, start D5½NS at maintenance rate
- If inability to take po DDAVP, and Na^+ >138, consider Vasopressin drip or SQ DDAVP
- If signs of hypovolemia and Na^+ >150: Correct free water deficit with an NS bolus followed by IV/po fluids

YES

Resume home DDAVP regimen

Can transfer from PICU if Na^+ remains within goal of 135-150, and hypovolemia corrected

Recommendations for Monitoring

- Check Na^+ q3-4 hours initially, and 2 hours prior to DDAVP doses.
- Space out to q12h, 2 hours prior to DDAVP doses, once Na^+ levels are in goal on home dosing.
- For recurrent polyuria and hypovolemia, check Na^+ sooner as needed.
- Monitor vitals, volume status and UOP q1h.

Central Diabetes Insipidus
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