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Diagnosis of Nephrogenic Diabetes Insipidus: Remember the Copeptin!

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To the Editor,

We are writing this letter to remember an often-forgotten biochemical dosage that can easily and safely diagnose nephrogenic diabetes insipidus (NDI).

We report the case of a 50-day-old male infant presenting with low-grade fever, dehydration, and a history of poor weight gain. Written informed consent for this case presentation was obtained from the patient's parents. His maternal grandfather had NDI. The infant's evaluation revealed hypernatremia (serum sodium: 162 mmol/L), elevated serum osmolality (332 mOsm/kg), low urine osmolality (85 mOsm/kg), and polyuria (284 mL/kg/day). Initial treatment involved intravenous rehydration with 0.2% NaCl until sodium levels decreased to below 160 mmol/L, followed by rehydration with intravenous 5% dextrose and oral fluids. After stabilizing the patient, venous access was lost, preventing further arginine vasopressin (AVP) testing. Although central venous access was considered, given the patient's stable condition and family history of NDI, we opted to measure copeptin levels instead, which were significantly elevated at 350 pmol/L. Treatment with hydrochlorothiazide and a hypo-osmolar diet was initiated. Genetic analysis identified the mutation c.574T>A (p.Cys192Ser) in the AVPR2 gene on the X chromosome.

Nephrogenic diabetes insipidus is characterized by kidney insensitivity to AVP, resulting in an inability to concentrate urine.[1,2] The water deprivation test (WDT), though often considered the gold standard for diagnosing polyuria-polydipsia syndrome (PPS), has limited diagnostic accuracy (approximately 70%) and can pose significant risks, particularly in young or dehydrated children.[1-4] Copeptin, the C-terminal glycopeptide of the AVP prohormone, is a reliable surrogate marker for endogenous plasma AVP due to its ease of measurement, rapid turnaround (results within 4 hours), and suitability for infants (only 50 µL of plasma required). It is also more stable (1 week at room temperature) with a half-life twice as long as AVP (<30 minutes).[1,2] Compared with WDT, baseline copeptin measurement is safer and does not interfere with the child's hemodynamic status.[1,2] Copeptin has proven invaluable in the differential diagnosis of PPS, especially in diagnosing NDI, as copeptin levels in these patients are consistently elevated.[3,4] Evidence suggests that a single baseline copeptin level >20 pmol/L, without prior water deprivation, can confirm NDI, making WDT unnecessary.[3,4]

To our knowledge, only two clinical cases in the literature have reported the utility of baseline copeptin in diagnosing NDI in children.[1,2] In our case, which is the youngest reported in the literature, we aim to remind clinicians that suspicion of NDI can be confirmed easily, quickly, and safely with this simple biochemical test.

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Informed Consent: Written informed consent was obtained from the parents of patient who agreed to take part in the study.

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