Hypernatremia: A known complication of conivaptan

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We report a 30-year-male who was diagnosed case of craniopharangioma. He was apparently well 2 months back when he had progressive decrease in vision (right > left). He was not able to visualize on lateral vision, and his right side pupil was not reacting to light. He got operated for the same and was shifted for elective ventilation. On 1st postoperative day, his trachea was extubated as computerized tomography (CT) scan was normal. One week after surgery, he suddenly became drowsy. On investigation, there was electrolyte imbalance (Na⁺ - 116 mEq/L, K⁺ - 2.7 mEq/L). He was started on 3% NaCl infusion along with KCl supplement.

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The single-centre retrospective study from The Methodist Hospital (TMH) compared the effect of hypertonic saline (HS) and conivaptan intervention in the management of 49 patients with hyponatraemia from January 2009 through November 2010. Regardless of whether the patient was euvoletic or hypervolemic, no significant difference was noted in serum sodium concentration after initiation of treatment or in frequency of over-correction between groups.[3] However, conivaptan given as a bolus can effectively treat acute hyponatraemia in brain-injured patients.[4]

Efficacy of vaptans is now well-accepted for management of hyponatraemia over a short period. However, vaptans have not become the mainstay treatment of hyponatraemia yet.[5] Whereas conivaptan is to be administered intravenously, the other vaptans such as tolvaptan, lixivaptan and satavaptan are effective as oral medication. Tolvaptan is approved for treatment of clinically significant hypervolemic/euvolemic hyponatraemia—serum sodium <125 mEq/L or less marked symptomatic hyponatraemia that has resisted correction with fluid restriction—but not heart failure without hyponatraemia.[6]

Conivaptan is a nonspecific arginine vasopressin receptor antagonist that has been used as therapy in adults who have hypervolemic hyponatraemia due to congestive heart failure.[7] Intravenous conivaptan is effective for increasing serum sodium levels and may be a potential adjuvant to enhance diuresis in children with cardiac disease.[8] Further studies are required before conivaptan can be recommended for routine use in children. However, conivaptan has not been approved by the FDA for the treatment of decompensated congestive heart failure. No dose adjustment is necessary in patients with mild or moderate renal impairment and in patients with mild hepatic impairment.[9] No data are available on the use of vaptans in acute hyponatraemia, and they are not indicated in hypovolemic hyponatraemia.[10] However, there are case reports where an extremely rapid correction of serum sodium with a typical dosing regimen of conivaptan were seen.[11] Vasopressin-receptor antagonists, by reversing osmotic shifts, may be novel agents to control ICP and cerebral edema, especially in the setting of falling sodium.[12]

The one of the possible cause of sudden neurological deterioration in this patient was diabetes insipidus which was ruled out by hourly urine output measurement that was within normal range as was the urine specific gravity. His volume status, adequately measured by central venous pressure, was also in normal limits. The intracranial bleed or infarction was also ruled out by doing a repeat CT scan was normal.

There was no specific indication to start the conivaptan infusion in our patient as he was responding well to the treatment with hypertonic saline. The infusion was started after receiving the instructions from the neurosurgeon as he wanted to see the response of this drug and the infusion of conivaptan was started without consulting the anaesthesiologist on duty. Through this
case report I want to simplify that though conivaptan is not the first line of treatment for the euvolemic or hypervolemic hyponatraemia, but they can be used as a life saving drug for euvolemic or hypervolemic hyponatraemia, when all other common treatment modalities fail. One has to be very cautious while using vaptan group of drugs and also perform the strict serum sodium level monitoring.

REFERENCES