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SCIENTIFIC LETTER

Levetiracetam can decrease desmopressin requirement in children with diabetes insipidus☆

El levetiracetam puede disminuir la dosis de desmopresina en niños con diabetes insípida

Hyponatremia due to water intoxication is a known adverse effect of antiepileptic drugs, particularly carbamazepine and oxcarbazepine. The postulated mechanisms are an increase in hypothalamic antidiuretic hormone (ADH) secretion on one hand, and increased action of the hormone at renal tubular level on the other.[1] Levetiracetam is a second-generation anticonvulsant that is increasingly prescribed because it has fewer side effects than the classical agents, also in pediatric patients.[2]

We report the case of a girl with no relevant family or personal history diagnosed at three years of age with sellar craniopharyngioma after consulting for headache. Initial management consisted of partial surgical resection. Following this first treatment, she developed growth hormone deficiency as sole complication; replacement therapy was not prescribed, due to the persistence of tumor remnants. At 6 years of age the patient developed cranial hypertension due to growth of the neoplasm, requiring repeat surgery to secure complete resection. At that time her anthropometric data were: weight 16 kg, height 101 cm (−3.13 standard deviations below average), body mass index 16.5 kg/m^2 (percentile 59) and body surface area 0.69 m^2. In this second postoperative period the patient presented panhypopituitarism including central diabetes insipidus, as well as adipsia, obstructive hydrocephalus, behavioral disorders, and cognitive, vision and motor deficits (paresis and spasticity of the left extremities). She was receiving treatment with hydrocortisone 2.5 mg/8 h p.o., levothyroxine 62.5 μg/24 h p.o. and desmopressin 5 μg/12 h via the nasal route in the event of diuresis >50 ml/h. The management of water-electrolyte metabolism was complicated by the cognitive problems and lack of thirst sensation. The parents were therefore instructed to provide a fixed water supply of 1300 ml/day to cover the basal needs and to immediately replace losses, and the blood sodium levels were closely monitored.

In the sixth month after surgery, the patient suffered seizures apparently not related to sodium plasma changes; these episodes were attributed to the treatment with levetiracetam 20 mg/kg/day p.o. in two doses. Diuresis was seen to decrease from the first day of administration of the drug. Following our instructions, the parents therefore discontinued desmopressin. Over the following days the patient experienced mild polyuria (50—70 ml/h) that was controlled with a small dose of intranasal desmopressin (0.6 μg/12 h, i.e., much less than the previous dose of 5 μg/12 h). This treatment is currently maintained, 24 months after surgery.

We confirmed the immediate antidiuretic action of levetiracetam, as occurs with other antiepileptic drugs. There have been some reports to date of this effect in adults, but not in children.[3–8] In patients with diabetes insipidus, such treatment decreases polyuria and reduces the need for antidiuretic medication. There have been reports of patients treated with desmopressin who show a decrease in need for the drug on adding carbamazepine[9] and lamotrigine,[10] though we have found no such reports in relation to this new anticonvulsant.

Although levetiracetam is less toxic than the conventional antiepileptic drugs, it does exert a certain antidiuretic effect in patients, including children. We need to be aware of this potential effect of the drug. At the start of administration there is a risk of hyponatremia due to water intoxication, and in individuals with diabetes insipidus, diuresis should be monitored more closely, with desmopressin dose reduction if needed.

References

1. Lu X, Wang X. Hyponatremia induced by antiepileptic drugs in patients with epilepsy. Expert Opin Drug Saf. 2017;16:77–87.
2. Attilakos A, Garoufi A, Paschalidou M, Tsirouda M, Siafakas N, Dinopoulos A. Serum sodium, potassium, and magnesium in children with epilepsy treated with levetiracetam monotherapy: A prospective study. CNS Neurosci Ther. 2018;24:846–7.
3. Rosca EC, Simu M. Levetiracetam-induced hyponatremia. Acta Neurol Belg. 2018;118:123–4.
4. Falhammar H, Lindh JD, Calissendorff J, Farmand S, Skov J, Nathanson D, et al. Differences in associations of antiepileptic drugs and hospitalization due to hyponatremia: A population-based case-control study. Seizure. 2018;59:28–33.
5. Nasrallah K, Silver B. Hyponatremia associated with repeated use of levetiracetam. Epilepsia. 2005;46:972–3.

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6. Belcastro V, Costa C, Striano P. Levetiracetam-associated hyponatremia. Seizure. 2008;17:389–90.
7. Córdoba López A, Granado Martínez D, Pérez Frutos MD, Jimeno Torres B. Levetiracetam-associated hyponatremia. Med Clin (Barc). 2010;135:429–30.
8. Ari H, Kahraman F, Acaban MB. The first case of levetiracetam-induced and tolvaptan-resistant hyponatremia. Turk Kardiyol Dern Ars. 2015;43:284–7.
9. Paragliola RM, Prete A, Kaplan PW, Corsello SM, Salvatori R. Treatment of hypopituitarism in patients receiving antiepileptic drugs. Lancet Diabetes Endocrinol. 2015;3:132–40.
10. Mewasingh L, Aylett S, Kirkham F, Stanhope R. Hyponatraemia associated with lamotrigine in cranial diabetes insipidus. Lancet. 2000;356:656.

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