A case: Hydrocephalus secondary to suprasellar arachnoid cyst with reset osmostat and Isolated Growth Hormone Deficiency

A male aged 6 years and 3 months was brought with a symptom of short stature that had become marked as the child became older. He was born 3300 g term and the parents were not relatives. His height was 104.6 cm (-2.6 sds), body weight 18.2 kg (-1 sds), bone age 4 years 6 months, and arterial blood pressure 110/70 mm Hg. Turgor and tonus was normal, and prepubertal and systemic findings were normal on physical examination. Target height was 175.5 cm (+0.36 sds) (mother 160 cm, father 178 cm).

**INTRODUCTION**

Arachnoid cyst (AC) is a rare situation and its prevalence changes between 1.7% and 2.6%. Patients with a suprasellar arachnoid cyst (SAC) typically present with symptoms related to mass effect leading to macrocrania and obstructive hydrocephalus. Precocious puberty, hypothyroidism, and growth hormone deficiency (GHD) are the most common endocrine disturbances that have been reported patients with a SAC. Persistent asymptomatic hyponatraemia, secondary to a rare subtype of syndrome of inappropriate antidiuretic hormone secretion (SIADH), reset osmostat described in the literature are rare. The syndrome of SIADH is occasionally seen after hypothalamic injury or dysfunction, although it typically occurs in association with other endocrine disturbances. Reset osmostat, a subtype of SIADH, has never been described as a presenting feature of SAC in the pediatric population. We present a case that presented with short stature and was found to have borderline hyponatraemia. He was diagnosed with SAC-hydrocephalus-reset osmostat, a subtype of SIADH and GHD following the various.

**CASE REPORT**

**Laboratory results**
- Glucose: 97 mg/dL
- Sodium: 131.6 mEq/L (135-143)
- Potassium: 4.85 mEq/L
- Thyroid function: Euthyroid
- Cortisol: 26.86 µg/dL
- ACTH: 33.8 pg/mL
- Blood lipid level: Normal
- Urine sodium 251.9 mmol/L
- Spot urine beta-2 microglobulin: 0.22 (0-0.3 mg/g creatinine)
- Blood gases: Normal
- Urine and blood amino-acid levels: Normal
- Renin: 0.54 (0.5-5.9 ng/ml/hour)
- Aldosterone: 11.93 (5-80 ng/dL)
- Renal ultrasonography: Normal

**Diagnosis**
- Short stature
- Mild hyponatremia
- Reset osmostat
- SAC-hydrocephalus
- GHD

**Treatment**
- Fludrocortisone and 2 gr/day oral salt- Persiste hyponatremia

**Laboratory results**
- The ability of the kidney to concentrate
  - Density of the initial urine in the morning: 1027
  - Spot urine: 146.1 mmol/L
  - Dilute (urinary density after fluid intake): 1007
  - Serum sodium: 128.8 mEq/L
  - Spot urine sodium: 131.3 mmol/L

**Image of pre-operative and post-operative suprasellar arachnoid cyst**

**CONCLUSION**

About 95% of AC cases are diagnosed with a neurological symptom and 5% due to endocrine disease. Reset osmostat is the C subtype of the four SIADH subtypes. The normal plasma osmolality is over 280 mosm/kg but the plasma osmolality threshold and plasma sodium concentration are low in this condition. Reset osmostat should be suspected in a patient with SIADH with moderate hyponatraemia (usually 125-135 mmol/L) that remains stable despite variations in water and sodium intake. The diagnosis is important as it is unnecessary and ineffective to try to treat the hyponatraemia. The diagnostic criteria of reset osmostat are: euvoalaemia; normal renal, adrenal and thyroid function; ability to concentrate urine; ability to excrete fluid overload, and hyponatraemia despite salt overload.

In conclusion, these patients should be treated and followed-up by keeping in mind that hyponatraemia is an important indicator and that endocrine problems can be coexistent with SAC or can develop during follow-up with individual variations in each patient.