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# Hyponatremia as the Initial Presentation of Disseminated Cryptococcosis with Hydrocephalus in an 81-year-old Male Patient

**Sung-Lin Hsieh**[1], I-Ru Chen[1], Mao-Wang Ho[2]
[1]Department of Internal Medicine-Nephrology, China Medical University Hospital, Taiwan
[2]Department of Internal Medicine-Infectious Diseases, China Medical University Hospital, Taiwan

**Case Study:** An 81-year-old male retired government employee with a history of diabetes mellitus, hypertension developed gait disturbances, cognitive decline, and urinary incontinence in recent 3 months. He had intermittent low grade fever up to 37.5˚C and lower urinary tract symptoms. Laboratory investigations revealed hypoosmolar (measured serum osmolality: 270 mOsm/kg$H_2O$) hyponatremia (serum sodium: 124 mmol/L). There was euvolemia, increased urine osmolality: 658 mOsm/kg$H_2O$ (>100 mOsm/kg), and increased urine sodium: 75 mmol/L (>20 mmol/L). The syndrome of inappropriate antidiuretic hormone secretion (SIADH) was diagnosed based on the Schwartz and Bartter criteria.
Investigations for infectious disease revealed a positive urine microscopic exam (RBC: 20/uL, WBC: 479/uL) and a positive midstream urine culture with *Cryptococcus neoformans*. Other positive findings were also revealed in the blood, and the CSF. There was high blood cryptococcal antigen titer (1:640). Brain CT revealed ventriculomegaly and hydrocephalus with an Evans index of 33.5% and the callosal angle was 61°. There was normal opening pressure 10 cm $H_2O$. However, the CSF study revealed elevated protein level (101.6 mg/dL), low CSF/blood glucose ratio (0.26) and lymphocytic pleocytosis (80 % lymphocytes, WBC 36/uL). The diagnosis of cryptococcal meningitis was supported based on a positive (1:80) CSF cryptococcal antigen test. Overall, disseminated cryptococcosis and cryptococcal meningitis with hydrocephalus were diagnosed. The HIV test was negative. Induction therapy with liposomal amphotericin B plus flucytosine and consolidation voriconazole therapy with subsequent implant of a lumbar peritoneal shunt provided an improved hyponatremia and neurologic outcome.

To our knowledge, this is the first reported case of SIADH secondary to disseminated cryptococcosis with hydrocephalus. Shunting procedures could ameliorate hyponatremia and neurologic outcome

Figure 1: The abnormal enlargement of the ventricles were improved after a lumbar peritoneal shunt. The Evans index was also decreased.