



Inappropriate Antidiuretic Hormone Secretion in Pulmonary Nocardiosis

To the Editor: Several species of the genus *Nocardia* have been associated with infections in humans.¹⁻³ We report a rare and interesting case of a patient with pulmonary *Nocardia asteroides* infection who developed severe hyponatremia caused by syndrome of inappropriate antidiuretic hormone secretions (SIADH).

An 81-year-old woman with a medical history of hypertension, hypercholesterolemia, childhood pulmonary tuberculosis, bronchiectasis, and depression presented at our hospital reporting dyspnea on slight exertion, cough, and yellowish expectoration of 4 days' duration. On physical examination, the patient was alert, oriented, afebrile, and normotensive. Bilateral wheezing was noted on auscultation. No edema was observed and findings from abdominal and neurological examinations were normal. Arterial blood gas analysis showed a pH of 7.37, PaO₂ of 55 mm Hg, PaCO₂ of 45 mm Hg, and an oxygen saturation of 88%. Blood tests revealed an elevated white blood cell count (29 800 cells/L) with a normal differential profile and a sodium concentration of 128 mEq/L; the other values analyzed were normal. A chest radiograph revealed residual lesions from healed tuberculosis in the right upper lobe and a new pulmonary infiltrate in the left lower lobe (Figure). *N. asteroides* sensitive to the antibiotics tested was isolated from sputum. The other microbiological tests were negative.

Antibiotics (co-trimoxazole, imipenem, meropenem, and aminoglycosides) were administered as part of the treatment regimen. The patient initially showed improvement, but her condition deteriorated over the following days as she developed severe hyponatremia (sodium concentration, 116 mEq/L) due to SIADH (plasma osmolality, 246 mOsm/kg; urine osmolality, 421 mOsm/kg; urinary sodium, 169 mEq/L). A computed tomography (CT) scan of the head revealed no abnormal findings. Sodium plasma levels improved after fluid intake was restricted and perfusion with 3% hypertonic saline solution was performed; nevertheless, after 27 inpatient bed-days, the patient suffered cardiorespiratory arrest and failed to respond to cardiopulmonary resuscitation.

N. asteroides is a branching, irregularly gram-positive bacillus. It is partially acid-fast, immotile, nonencapsulated, strictly aerobic, and produces catalase and superoxide dismutase³; 90% of these bacilli also produce beta-lactamase. *N. asteroides* is not part of the flora of the human digestive system. It usually forms colonies whose characteristic odor is that of wet earth.³ Pulmonary nocardiosis is

Figure. Posteroanterior chest radiograph showing residual lesions from healed tuberculosis of the right upper lobe and a new lung infiltrate in the left lower lobe.



acquired through inhalation of the bacteria and presents as a subacute or chronic infection. Hematogenous spread, usually to the brain (multiple brain abscesses) and the skin, occurs in 15% to 40% of cases.^{2,3} Diagnosis is difficult because the symptoms are usually nonspecific.^{1,3} Of patients diagnosed with pulmonary nocardiosis, 80% to 90% have some type of predisposing factor such as chronic obstructive pulmonary disease, bronchiectasis, or healed tuberculosis—as was the case with our patient. In fact, Ferrer et al⁴, in a study of 129 specimens that tested positive for *Nocardia*, observed that a large portion of infected patients had bronchiectasis and had been receiving long-term corticosteroid treatment. The prevalence of pulmonary nocardiosis has increased in recent years due to, among other factors, a rise in the survival rate of immunodepressed patients. The overall mortality rate from pulmonary nocardiosis may be quite high.³ SIADH involves a sustained inappropriate secretion of antidiuretic hormone that occurs without any osmotic or nonosmotic stimuli or any other cause of hyponatremia. Concentrated urine is excreted, despite the hypo-osmolality of the plasma.⁵ In 1999, Rámila et al⁶ reported the first case of pulmonary nocardiosis presenting with SIADH. In that case, the patient died despite receiving treatment. Brain abscesses caused by *Nocardia* were found on the CT scan and on autopsy. To our knowledge, the present case is only the second to be reported in which SIADH occurred in a patient with pulmonary nocardiosis; however, unlike the aforementioned case, the CT brain scan revealed no central nervous system abnormalities.

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