Risperidone and Hyponatremia: A Case Report

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A 48 year-old white male not suffering from endocrine disease or polydipsia, not taking diuretics, and suffering from no renal disease was started on risperidone and discharged on no other drug from Western Missouri Mental Health Center (WMMHC) after an 8-day hospitalization. Seven days later he was admitted to a university medical center with generalized seizures, hyponatremia, respiratory failure, and rhabdomyalysis. He eventually recovered, was transferred back to WMMHC, and stabilized on appropriate medication. A search of the literature indicates no case reports linking risperidone to hyponatremia. It is assumed that the mechanism of hyponatremia is similar to other psychotropic medication in that it is secondary to the syndrome of inappropriate antidiuretic hormone (SIADH).

KEY WORDS: Risperidone; hyponatremia; syndrome of inappropriate antidiuretic hormone (SIADH).

INTRODUCTION

There is a variety of conditions that can lead to an abnormal and sustained reduction in the serum sodium concentration. Usually, however, this results from defective urinary dilution. Under usual conditions, dilution is corrected with water diuresis, which corrects the hypoosmotic state (1,2). Medical disorders such as renal disease and endocrine disease can result in low Na+ levels, as can some diuretics and drinking large amounts of water (polydipsia—defined as drinking 4–20 L of water per day). Psychotropic medications such as haloperidol, thioridazine, carbamazepine, and amitriptyline have all been mentioned in connection with hyponatremia. Risperidone has also been mentioned in connection with hyponatremia, but nothing has been reported in the literature to date. The Physicians GenRx (3) mentions hyponatremia as an infrequent adverse reaction, as does the product insert from Janssen Pharmaceutica, Inc. There is some mention of using risperidone in the treatment of polydipsia and schizophrenia in the literature (4,5) but no mention of risperidone causing hyponatremia.

As with the other psychotropics, we assume that the syndrome of inappropriate antidiuretic hormone (SIADH) may be the cause of hyponatremia with the use of risperidone. In SIADH the ADH is released inappropriately despite dilution of fluids with increased extracellular water, causing swelling of the brain cells resulting in the neurological findings. The picture as in this case report ranges from lethargy and confusion to stupor, seizures, and coma. It can develop rapidly, with hyperexcitability progressing to seizures. Usually Na+ levels are less than 125 mEq/L when symptoms occur, but higher Na+ levels can produce symptoms if the decrease has been rapid. The following is a case of critical hyponatremia in a patient, not polydipsic, without renal or endocrine disease, and whose only medication was risperidone. He presented to a university medical center with seizures and coma after taking this medication for 2 weeks.

CASE REPORT

XY is a 48-year-old white male admitted to Western Missouri Mental Health Center (WMMHC)
on August 4, 1996, claiming that he was Christ in his second coming. He stated that he had a lot of stress and was suicidal. He was hallucinating, his affect was flat, and he gave a history of treatment with neuroleptics since 1969. Mental status examination was consistent with acute paranoid schizophrenia. Review of systems did not indicate any major physical illness. Physical examination revealed the patient to be 5 ft 10 in. 170 lb, and with a pulse of 70, a respiration of 15, a temperature of 98.6°F, and a blood pressure of 118/74. He was in good health physically and direct observation did not indicate polidipsia. It was doubtful that he was medication compliant. He was started on risperidone, 1 mg bid, and this was increased to 3 mg bid. He was on no other medication. During the course of his hospitalization, vital signs and laboratory data remained within normal limits. His Na+ was 136 mEq/L and urine and drug screen were negative. His hospital course was one of rapid improvement and the patient was discharged on August 12, 1996, taking risperidone, 6 mg per day.

Seven days following his discharge from WMMHC the patient was admitted to the emergency room at Truman Medical Center—West after having had a generalized seizure prior to his admission. He was hyponatremic (Na+ 114 mEq/L) and was cyanotic. ECG revealed LBBB and ST elevation. Urine analysis was not remarkable, a chest film showed bilateral infiltrates, K+ was 4.1 mEq/L, Cl was 107 mEq/L, Bun was 8, Cr was 0.7, and blood sugar was 174 mg%. Following stabilization the patient was admitted to the ICU with a diagnosis of hyponatremia, generalized seizures (another seizure occurred in the emergency room), and possible aspiration pneumonia with possible anterior myocardial infarction.

Following the patient's admission to the ICU, his Na+ fell to 110 mEq/L. He was treated with hypertonic saline and the Na+ was corrected to 120 mEq/L. There were no more seizures. He developed acute rhabdomyolysis with a CPK of 100,000 R. This was managed by giving the patient 5% dextrose in H2O with 2 ampoules of sodium bicarbonate and 25 g mannitol. Urine output was managed with i.v. furosemide and fluids. The patient's Na+ slowly rose to 136 mEq/L. His rhabdomyolysis cleared in six days. The only complication was cellulitis in the right lower extremity. He was started on haloperidol, 10 mg per day, and transferred back to WMMHC.

His readmission to WMMHC again found the patient grossly psychotic and very anxious. He was stabilized on haloperidol, 15 mg per day, and when he was discharged his cellulitis was much improved and he was emotionally stable. His vital functions throughout hospitalization were well within normal limits, and his Na+ upon readmission to WMMHC was 137 mEq/L. It remained within normal limits. He was again discharged to outpatient care, psychiatrically stable and in good physical condition.

**DISCUSSION**

Since it was first described by W. B. Schwarts in 1957, SIADH has been associated with many drugs and diseases (6). It is felt to be the most common form of hyponatremia among hospitalized patients (2). Many drugs used in psychiatric patients have been reported in association with SIADH (6-8). Here we have presented a case of SIADH with the use of risperidone supported by the serum electrolyte abnormalities and the lack of any known other cause for the SIADH. Our report also indicates that prompt medical attention is necessary when hyponatremia develops since critical levels can occur within a few days. This is a special concern among elderly psychiatric inpatients, as they seem to develop hyponatremia more often than others because of co-morbidities and since they use many more medications. (6) As new psychotropics are approved for use the list of those associated with hyponatremia and SIADH will possibly grow. Risperidone is a drug that might now be added to such a list.

**SUMMARY**

In summary, we have presented a case of critical hyponatremia in an otherwise healthy 48-year-old male. A review of his history, old medical records, and two complete psychiatric evaluations at WMMHC found the patient to be suffering from acute and chronic schizophrenia. He was in good physical health and there was no evidence of other physical disorders which could account for the hyponatremia. He was on no medication used was risperidone, which he had taken for 14 days. The hyponatremia was complicated by generalized seizures, cellulitis, rhabdomyolysis, possible aspiration pneumonia, and Na+ at critical levels of 110 mEq/L. We assume that the mechanism of SIADH is responsible for this clinical picture.