Pseudohyponatremia and Pseudohyperphosphatemia in a Patient with Human Immunodeficiency Virus Infection

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Dear Sir,

Hyponatremia is a common finding in patients with the acquired immunodeficiency syndrome (AIDS) or AIDS-related syndrome (ARC) and is most often due to hypovolemia or to antidiuretic hormone excess with normovolemia [1, 2]. We describe a patient with ARC who had pseudohyponatremia related with a massive polyclonal hypergammaglobulinemia that was also responsible for pseudohyperphosphatemia.

A 29-year-old African man with human immunodeficiency virus (HIV) infection was hospitalized for weight loss. Clinical examination showed multiple peripheral lymphadenopathies and hepatosplenomegaly. Serum values were: sodium, 123 mmol/l (indirect-reading potentiometry); potassium, 5 mmol/l; chloride, 107 mmol/l; bicarbonate, 15 mmol/l; creatinine, 121 µmol/l; total proteins, 14.0 g/dl; glucose, 4.4 mmol/l; cholesterol, 2.00 mmol/l; triglycerides, 1 mmol/l; calcium, 1.99 mmol/l; phosphorus, 2.47 mmol/l (colorimetric assay using complexation with ammonium molybdate); creatine kinase: 60 U/l (normal range 15-120). Daily natriuresis was 83 mmol. Serum protein electrophoresis: albumin, 2.4 g/dl; gamma globulin, 11.2 g/dl without peak. Immunoelectrophoresis confirmed the absence of monoclonal component. Serum cortisol was normal. Serum osmolality determined by the cryoscopic method was 293 mmol/l. After deproteinization, serum phosphorus level fell to 1.60 mmol/l. The CD4 lymphocyte count was 319/mm³. Biochemical status remained stable during the course of hospitalization and no clinical feature possibly reliable to hyponatremia was observed.

Pseudohyponatremia is a falsely low serum sodium measurement: Serum sodium concentration obtained with flame emission spectrophotometer or indirect-reading potentiometry is low while serum osmolality is normal [3]. In this situation, serum water occupies a reduced serum fraction whereas the non-aqueous serum fraction is expanded. This artifact is mainly observed in hyperlipidemic patients, or in patients with myeloma and monoclonal hypergammaglobulinemia. In patients with ARC or AIDS, the usual causes of hyponatremia are digestive and renal loss of sodium, Addison's disease and antidiuretic

hormone excess due to opportunistic infections. Polyclonal hypergammaglobulinemia is also a common finding in patients infected by HIV. As pseudohyponatremia may lead to serious errors in patient management [4], we think it must be known in patients with HIV infection. Pseudohyperphosphatemia is well known in the setting of hyperlipidemia [5] and may also occur when marked hyperproteinemia is present, i.e., in multiple myeloma [6]. The exact mechanism or the interference of the proteins with the colorimetric assay is still unclear. In the absence of common causes of hyperphosphatemia such as renal failure, rhabdomyolysis, cancer treatment, a high serum phosphorus level may be due to pseudohyperphosphatemia. In hyperglobulinemic patients with HIV infection, this diagnosis would avoid further useless investigations of phosphorus and calcium metabolism.

References

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