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New evidence for high prevalence of renal salt wasting (RSW), identification of novel protein causing RSW and introducing new syndrome of RSW in Alzheimer's disease

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Background: Cerebral/renal salt wasting (RSW) is considered rare and has identical parameters as SIADH to create a diagnostic and therapeutic dilemma, whether to fluid-restrict water-logged patients with SIADH or administer saline to dehydrated patients with RSW. We previously demonstrated the presence of a natriuretic protein (NP) in the plasma of RSW neurosurgical patients and in patients with Alzheimer's disease (AD).
Methods: We utilized a new algorithm to determine the causes of hyponatremia in the general hospital wards and identified the NP in a RSW patient with subarachnoid hemorrhage (SAH) and another with AD by the same rat clearance methodology.
Results: Of 62 hyponatremic patients, (A) 17 patients (27%) had SIADH, (B) 19 patients (31%) had a reset osmostat (RO), (C) 24 patients (38%) had RSW, 21 without clinical evidence of cerebral disease, 10 had baseline urinary sodium (UNa) < 20 mEq/L; (D) 1 had Addison disease and (E) 1 (1.6%) due to hydrochlorothiazide.
The SAH and AD sera had identical robust increases in fractional excretion (FE) of sodium and especially FElithium, suggesting that the NP had it major effect on proximal tubule sodium transport. Proteomic and SWATH (Sequential Windowed Acquisition of All) analyses identified increased levels of haptoglobin related protein (Hpr) without signal peptide (WSP). Recombinant Hpr with signal peptide had no natriuretic activity (NA), Hpr-WSP had a robust NA in a dose-dependent manner.
Conclusions: RSW is common, change cerebral to renal salt wasting, remove RO as subtype of SIADH and UNa is an unreliable marker. Hpr-WSP may be the NF in C-RSW, may be biomarker to differentiate RSW from SIADH, introduces a new syndrome of RSW in AD and can effectively treat congestive heart failure when combined with distal diuretic.

Biography

John K Maesaka was born in Hawaii, received degrees from Harvard College and Boston University School of Medicine, did his medical residencies at BarnesJewish Hospital at Washington University In St. Louis and Mount Sinai Hospital in New York and renal fellowship at Mount Sinai Hospital. His interest-driven decision to spend 5 years exclusively in the renal physiology laboratory at Mount Sinai Hospital as a renal fellow and member of the faculty proved to be the best investment he made to pursue an academic career in medicine. He was involved in developing colorimetric methods for the determination of uric acid and phosphorus in blood and urine that were applied to studying the transport characteristics of both electrolytes by renal micro puncture techniques in rat kidney. He developed several bioassays to demonstrate the presence of a natriuretic factor in the blood of patients with renal salt wasting and Alzheimer's disease and more recently identified the elusive natriuretic factor after more than a 25-year pursuit.

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