Influence of weather conditions, drugs and comorbidities on serum Na and Cl in 13000 hospital admissions: evidence for a subpopulation susceptible for SIADH

Christian Bucher, Daniel Tapernoux, Markus Diethelm, Christine Büscher, Anja Noser, Thomas Fehr & Samuel Henz

OBJECTIVES
Considerable variation in serum sodium (Na) and chloride (Cl) is found in patients at hospital admission. Our goal was to quantify the respective impact of drugs, comorbidities, demographic factors and weather conditions on serum Na and Cl.

DESIGN AND METHODS
For 13277 consecutive patients without terminal kidney disease admitted to the Department of Internal Medicine of the Kantonsspital St. Gallen drug history on admission, age, sex, body weight, ICD-10 diagnoses, and laboratory data were extracted from electronic medical records. Weather parameters prior to hospital admission were also integrated in a multivariate regression analysis.

RESULTS
Both serum Na and Cl showed an asymmetric left-tailed distribution. Median (interquartile range) Na was 138 (136/140) and Cl 104 (101/106). The distribution of sodium in patients with one or more risk factors for SIADH was best explained by the presence of two populations: one population with a similar distribution as the unexposed patients and a smaller population (about 25%) shifted to lower sodium levels. Lower weight, lower blood pressure, kidney dysfunction, fever, and diabetes were associated with both lower Na and Cl. Higher ambient temperature and higher air humidity preceding admission were associated with both higher Na and Cl values.

CONCLUSIONS
Na and Cl at hospital admission are highly influenced by ambient weather conditions, comorbidities and medication. The bimodal distribution of Na and Cl in persons exposed to risk factors for SIADH suggests that SIADH may only affect a genetically distinct vulnerable subpopulation.
type: journal paper/review (English)
date of publishing: 02-01-2014
journal title: Clin Biochem (47/7-8)
ISSN electronic: 1873-2933
pages: 618-24