Serum chloride predicts mortality risk in type 2 diabetes – analysis of 91,159 patients from the West of Scotland

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BACKGROUND AND AIM

- Serum chloride (Cl\(^-\)) is routinely measured and is an emerging risk factor for mortality and CV disease
- Low serum Cl\(^-\) is associated with higher mortality in the general population, those with hypertension, heart failure, chronic kidney disease and stroke
- Aim of this study is to determine if serum chloride is associated with mortality risk (all-cause, CV, MI, heart failure (HF), stroke) in adults with T2DM

METHODS

Study population
- Data were available for 91,159 adults with T2DM from the Scottish Care Information Diabetes Collaboration (SCI-DC) database through NHS Greater Glasgow and Clyde Safehaven
- Follow-up period was 10 years
- Patients were stratified into two groups based on serum chloride levels (<100 and ≥100 mmol/l)

Statistical methods
- KM, Cox-PH and Spline regression models were used to study the association between serum chloride and cause-specific mortality
- Model1 (KM)
- Model 2 (Cox-PH and Spline regression) was adjusted for age, sex, smoking, deprivation (SIMD), duration of diabetes, SBP, BMI and HBA1c

RESULTS

Study population

Demographics
- N=91,159
- Age, years (IQR): 61.4 (50.3-71.6), 62.5 (50.9-73.1), 61.2 (50.2-71.4), <0.001
- Female, N (%): 42774 (47), 6270 (47), 36504 (47), 0.4
- Cl\(^-\), mmol/L (SD): 102.9 (3.6), 96.7 (3), 103.9 (2.5), <0.001
- Na\(^+\), mmol/L (SD): 138.6 (3.1), 135.3 (3.8), 139.2 (2.5), <0.001

Univariate All-Cause Mortality

Model 1
- All-cause (N=20,304)
- N=24,408

Adjusted Cause Specific Mortality

Model 2
- All-cause (N=3,300)
- All-CV (N=1,003)

CONCLUSION

- Low serum chloride, within the normal laboratory reference range, is associated with greater risk of all-cause mortality and cardiovascular mortality