SUPPLEMENTAL MATERIAL

Contents

Table S1. Definitions of high-risk subgroups

Subgroup	Definition
Chronic kidney disease	Defined as either a diagnosis of chronic nephritic syndrome (ICD-10 code: N03), glomerular disease (N05-N08), chronic kidney disease/chronic renal failure (N18-N19), diabetic nephropathy (E102, E112, E122, E132, E142), or hypertension with renal failure (I120, I13), or the presence of an average eGFR of <60 $mL \cdot min^{-1} \cdot 1.73\ m^{-2}$ CKD stage 1: eGFR ≥90 $mL \cdot min^{-1} \cdot 1.73\ m^{-2}$, stage 2: eGFR 60-89 $mL \cdot min^{-1} \cdot 1.73\ m^{-2}$, stage 3a: eGFR 45-59 $mL \cdot min^{-1} \cdot 1.73\ m^{-2}$, stage 3b: eGFR 30-44 $mL \cdot min^{-1} \cdot 1.73\ m^{-2}$, stage 4: eGFR 15-29 $mL \cdot min^{-1} \cdot 1.73\ m^{-2}$, and stage 5: eGFR <15 $mL \cdot min^{-1} \cdot 1.73\ m^{-2}$
Diabetes mellitus	Defined as a diagnosis of DM (E10-E14)
Heart failure	Defined as a diagnosis of heart failure (I50, I110)
Hypertension	Defined as a diagnosis of hypertension (I10-I15)

ICD-10, International Classification of Diseases 10th revision; eGFR, estimated glomerular filtration rate; DM, diabetes mellitus

Table S2. List of comorbidities

Condition	ICD-10 code
Myocardial infarction	I21; I22; I23; I24
Peripheral vascular disease	I70; I71; I72; I73; I74; I77
Cerebrovascular disease	I60-I69; G45
Chronic pulmonary disease	J40-J47; J60-J67; J684; J701; J703; J841; J920; J961; J982; J983
Moderate to severe liver disease	B150; B160; B162; B190; K704; K72; K766; I85
Atrial fibrillation or atrial flutter	I48
Valvular heart disease	I00-I02; I05-I09; I34; I35; I36; I37; Q20-Q25;
Alcoholism-related or other substance-abuse related disorders	T36-T65; F10-F19; G312; G612; G721; I426; K292; K860; K70; R780; T51; Z714; Z721
Acute kidney injury	N17
Sepsis	A021, A207, A227, A241, A267, A282, A327, A394, A400-A403, A409-A415, A418-A419, A427, A548, B007, B349, B377, D71, I301, I330, J020, J209, J950, L029, L080, M8699, O080, O753, O85, O883
Gastrointestinal bleeding	K250, K252, K254, K256, K260, K262, K264, K266, K284, K290, K571, K573
Gastrointestinal perforation	K251, K252, K255, K256, K261, K265, K266, K285, K570, K572
Peripheral edema	R600

ICD-10, International Classification of Diseases 10th revision;

Table S3. Definitions of clinical outcomes

Outcome	Definition
In-hospital death	Based on death information in the hospital discharge summary
Cardiac events	Hospitalizations with ICD-10 codes of I21, I22, I23, I44, I45, I46, I47, I48, or I49
Hospitalization due to HF	ICD-10 code I50 or I110 as the main reason for hospitalization
Introduction of renal replacement therapy	Presence of a national receipt code for dialysis or renal transplant

ICD-10, International Classification of Diseases 10th revision; HF, heart failure; S-K, serum potassium

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No.	Recommendation	Page No.	Relevant text from manuscript
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1	Title: A hospital-based cohort study
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2	Structured abstract
Introduction				
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4	Introduction
Objectives	3	State specific objectives, including any prespecified hypotheses	4	Line 90: In this study…
Methods				
Study design	4	Present key elements of study design early in the paper	6	Line 107: Study design and patient selection
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6	Line 108: There were 1,208,894 adult patients…
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	6	Line 111: Hyperkalemia patient was defined as…
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	8	Line 146: A propensity score of hyperkalemia was developed using covariates…
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7	Line 124: Covariates and clinical outcomes

Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6	Line 100: Data source Line 124: Covariates and clinical outcomes
Bias	9	Describe any efforts to address potential sources of bias	8	Line 164: Although this inclusion allowed the assessment of…
Study size	10	Explain how the study size was arrived at	6	Line 108: There were 1,208,894 adult patients… Line 155: After PS matching, 5,859 hyperkalemia patients…

Continued on next page

Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7	Line 141: Statistical analysis
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7	Line 141: Statistical analysis
		(*b*) Describe any methods used to examine subgroups and interactions	8	Line 158: The subgroup of interest included…
		(*c*) Explain how missing data were addressed	N.A.	We did not conduct any imputations for missing data. The limitations of using secondary data is described as study limitations in the discussion part.
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	N.A.	Because this is a retrospective cohort study using secondary data, we did not make effort to address the lost of follow up from database.
		(*e*) Describe any sensitivity analyses	8	Line 164: Although this inclusion allowed the assessment of…
Results				
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7	Line 118: For the present analysis…
		(b) Give reasons for non-participation at each stage	7	Line 118: For the present analysis…
		(c) Consider use of a flow diagram	Figure 1	Study flow diagram is depicted in Figure 1.
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	10	Line 173: Baseline characteristics
		(b) Indicate number of participants with missing data for each variable of interest	N.A.	N.A.
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	10	Line 177: the mean length of follow up was approximately 3.5 years.
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	10	Line 184: Figure 2 shows…
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	N.A.	N.A.

		Cross-sectional study—Report numbers of outcome events or summary measures	N.A.	N.A.
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	10	Described in the results section. For instance, we used 95% confidence intervals to present the estimated values.
		(*b*) Report category boundaries when continuous variables were categorized	10	Described in the results section such as Table 1 for baseline characteristics. For instance, the severity of hyperkalemia was categorized based on the serum potassium values.
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	10	Described in the results section. For instance, the results were described as relative risks such as hazard ratios for clinical outcomes.

Continued on next page

Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	10	L195: Sensitivity and subgroup analysis
Discussion				
Key results	18	Summarise key results with reference to study objectives	11	Line 209: This study assessed…
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	12	Line 245: Despite these advantages, this study also has several limitations.
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	13	Line 264: Finally, since this us an observational study, results should be interpreted carefully.
Generalisability	21	Discuss the generalisability (external validity) of the study results	13	Line 259: Furthermore, data were obtained from 364 hospitals across Japan, which improved the generalizability of the results.
Other information				
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	14	Line 275: This study and the corresponding analyses were supported and funded by AstraZeneca K.K.

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.