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ORIGINAL ARTICLE

All-cause mortality associated with hyperkalaemia in hospitalised adult patients: a scoping review

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ABSTRACT

Introduction: Although the association between hyperkalaemia and all-cause mortality has been described, the evidence for it is fragmented and underrepresents populations from low- and middle-income countries. We conducted a scoping review to map existing research on hyperkalaemia-associated mortality in hospitalised adults and identify key gaps in the literature.

Materials and methods: This scoping review followed the Preferred Reporting Items for Systematic Reviews and Meta-analysis-Scoping Reviews. Studies from January 2001 to January 2025 were eligible for inclusion. The following bibliographic databases were searched: Medline (PubMed), CINHAL (EBSCOhost), and Web of Science (Clarivate). The final protocol was registered with the Open Science Framework.

Results: Twenty-two studies were included, encompassing 777,020 patients, of whom 78,685 (10.1%) developed hyperkalaemia. The overall in-hospital mortality among these hyperkalaemia patients was 22.8% (95% CI 22.5–23.1%). Frequent comorbidities were lung disease (67.2%), liver disease (53.1%), congestive cardiac failure (42.9%) and acute kidney injury (AKI) (30.8%). Acute kidney injury was associated with the highest mortality rate (41%). Serum potassium concentration ($[K^+]$) was a consistent independent predictor of death in 9 of 11 multivariate analyses; however, the correlation between $[K^+]$ and mortality was weak ($r = 0.248$, $P = 0.489$). Geographic representation was skewed, with only three studies conducted in Africa.

Conclusion: This scoping review mapped current evidence on hyperkalaemia-associated all-cause mortality in hospitalised adults, and was relatively high, especially with concurrent AKI. We found that $[K^+]$, acute kidney injury, and age were the most common independent predictors of death. Future research should standardise definitions of hyperkalaemia and expand geographic representation, particularly in Africa.

Keywords: hyperkalaemia; all-cause mortality; death; hospital.

INTRODUCTION

Hyperkalaemia is a common and potentially fatal electrolyte disturbance encountered in hospitalised adult patients [1-3]. An acute increase in potassium concentration reduces the resting membrane potential of muscle cells and of the cardiac conduction system, causing muscle weakness and cardiac arrhythmias such as ventricular tachycardia and ventricular fibrillation [4].

The condition is defined as a serum potassium concentration $[K^+]$ exceeding 5.5 mmol/L. The prevalence of hyperkalaemia varies depending on the threshold set for $[K^+]$. A 2022 systematic review reported an overall global prevalence of 8.6% with an incidence of 5.1 cases per one hundred person-years. A total of 144 studies examined the prevalence of hyperkalaemia in hospitalised patients, reporting it to be 8.7% regardless of the definition used. When hyperkalaemia was specifically defined as $[K^+] \geq 5.5$ mmol/L, the prevalence was similar at 8.6%. Only 2.6% of included studies were performed in Africa [2]. Another large study conducted in Cape Town, South Africa, that included 1921 adult patients, reported a prevalence of 3.7% over one year [7].

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Hyperkalaemia is frequently encountered in patients with acute and chronic kidney disease, heart failure, diabetes mellitus and with use of certain drugs that interfere with renal elimination such as potassium-sparing diuretics, renin–angiotensin–aldosterone system inhibitors, non-steroidal anti-inflammatory drugs and trimethoprim, or that cause a shift of potassium out of cells such as beta-blockers [4,8].

The association between hyperkalaemia and all-cause hospital mortality has been well established and ranges from 12.9–42.5% [6,7,9,10], reflecting differences in patient populations, severity of the condition, and treatment protocols across studies. A recent study from sub-Saharan Africa reported an all-cause mortality rate of nearly 30% in hospitalised patients with hyperkalaemia [7], which was similar to another study performed at the University of Pittsburgh Medical Center [11]. Predictors of all-cause mortality included the severity of hyperkalaemia, age, acute kidney injury and the emergency therapy given for the condition [7].

Despite the clinical significance of hyperkalaemia, data on its associated mortality, especially in the context of varying definitions, comorbidities, and geographic representation, are fragmented. Furthermore, evidence from low- and middle-income countries, particularly in Africa, is sparse.

We could not identify any systematic or scoping reviews that specifically reported on the all-cause mortality of hospitalised adult patients with hyperkalaemia. Therefore, by performing this scoping review, we aimed to fill this knowledge gap.

OBJECTIVES

We conducted a scoping review to systematically map the existing literature on hyperkalaemia-associated mortality in hospitalised adult patients and identify gaps in knowledge. This review provides an overview of the current evidence, including variations in study populations, settings, and aetiologies. By highlighting inconsistencies and areas lacking sufficient research, we aim to guide future studies and contribute to improved knowledge and care for patients at risk of hyperkalaemia.

The following research questions were investigated:

1. What is the reported all-cause mortality rate among adult patients hospitalised with hyperkalaemia?
2. What are the commonly reported comorbidities/risk factors in these patient populations?
3. Is there any correlation between serum [K^+] and all-cause mortality?
4. What are the predictors of all-cause mortality associated with hyperkalaemia?

MATERIALS AND METHODS

Protocol and registration

This scoping review followed the Preferred Reporting Items for Systematic Reviews and Meta-analysis–Scoping Reviews (PRISMA-ScR). Research articles were included if they addressed mortality in hospitalised adult patients (18 years or older) with hyperkalaemia by any definition. The final protocol was registered with the Open Science Framework on 27 January 2025 (https://osf.io/etkap/).

Eligibility criteria

Research articles were included if they addressed mortality in hospitalised adult patients (≥18 years old) with hyperkalaemia by any definition. Studies had to report on mortality rates, associated comorbidities, serum [K^+], or factors influencing outcomes such as disease severity, and comorbidity burden. Studies from January 2001 to January 2025 were eligible for inclusion. The review considered the following study designs: cohort studies (prospective and retrospective), case-control studies, cross-sectional studies, and case series. Studies involving paediatric populations, patients managed exclusively in outpatient settings, animal studies, and case reports were excluded. Studies reported in all languages were included.

Information sources

To identify relevant research, we searched the following bibliographic databases: Medline (PubMed), Cumulative Index to Nursing and Allied Health Literature (CINAHL) (EBSCOhost), and Web of Science (Clarivate). The search strategy was tailored to each database. The respective search strategies were developed by the authors and are available in supplementary information.

Search strategy

The search strategy for Medline (PubMed) was adapted for other databases:

#1 "Hyperkalemia"[MeSH] OR "hyperkalemia" [Title/Abstract] OR "hyperkalaemia" [Title/Abstract] OR "high potassium" [Title/Abstract] OR "elevated potassium" [Title/Abstract];

#2 "Mortality"[MeSH] OR "mortality" [Title/Abstract] OR "death" [Title/Abstract] OR "survival" [Title/Abstract] OR "fatal outcome" [Title/Abstract] OR "mortality rate" [Title/Abstract];

#3 "Hospitalised"[MeSH] OR "hospitalised" [Title/Abstract] OR "hospitalised" [Title/Abstract] OR "inpatients" [Title/Abstract];

#4 "Adult"[MeSH] OR "adult" [Title/Abstract] OR "adults" [Title/Abstract];

#1 AND #2;

#3 AND #4;

#5 AND #6.

Selection of eligible research

After removal of duplicates, the retrieved records were imported into Rayyan for screening and review. Two independent reviewers (B.B. and M.Y.C.) first assessed the titles and abstracts of the articles. For those that appeared potentially eligible, full-text versions were obtained and assessed by both reviewers separately. Disagreements were resolved through discussion between the reviewers. The reasons for excluding any articles during the full-text review were recorded.

Data extraction tool and data items

The first reviewer (B.B.) developed and pilot-tested the data extraction tool with input from the other author. Data extraction was performed by a single reviewer for each study included. Data were extracted by one reviewer and independently verified for completeness and accuracy by a second. While dual independent extraction represents best practice, time and resource constraints necessitated this approach; however, to minimise bias, the second reviewer was blinded to the initial extraction decisions. The data extracted included study design, type of publication, year of publication, setting (hospital, country, etc.), sample size, demographic information (age, sex, etc.), comorbidities (e.g., chronic kidney disease, heart failure), medications (including drugs used to treat hyperkalaemia, and any drugs that could influence [K^+]), definitions of hyperkalaemia and mortality, and mortality data (timing, cause of death, etc.). This data extraction approach ensured that all critical factors influencing hyperkalaemia-associated mortality in hospitalised patients were captured and reviewed.

Synthesis of results

A narrative synthesis of the extracted data is provided, with the findings presented in a tabular format. The narrative discussion highlights and compares the similarities and differences across the studies.

RESULTS

The results of the search strategy and study selection are shown in Figure 1 and supplementary information. We included a total of 22 research articles in the scoping review [7,12-32].

Characteristics of included research

Descriptive characteristics of the studies incorporated are presented in Table 1. Study designs included retrospective cohort studies (n = 14), prospective cohort studies (n = 6), and cross-sectional studies (n = 1). Geographic distribution revealed studies from North America (n = 7), Europe (n = 6), Asia (n = 6), and Africa (n = 3). Publication dates ranged from 2001 to 2023, with 11 studies (48%) published after 2019. Sample population sizes varied from 26 to 192,182. Hyperkalaemia definitions varied, with the most frequent threshold being serum [K^+] ≥5.0 mmol/L (reported in 45% of studies). Clinical settings included medical wards (n = 7) [12-14,19,22,27,29], cardiology wards (n = 3) [16,25,32] and intensive care units (n = 4) [7,15,21,31]; however, the details of settings were not clearly specified in several studies.

The commonly reported comorbidities in these patient populations

The total patient sample size was 777,020, whose characteristics, corresponding comorbidities, and associated drugs to treat hyperkalaemia are detailed in Table 2. A total of 78,685 (10%) patients developed hyperkalaemia. Their average age was sixty-three years. The most common comorbidities associated with hyperkalaemia included lung disease (67.2%), liver disease (53.1%), congestive cardiac failure (42.9%) and acute kidney injury (30.8%). The most frequently administered drugs were beta-blockers and loop diuretics at 60.9% and 53.7%, respectively (Table 2). While most comorbidities and medications were reported across studies, findings for some conditions and medications were based on small subgroups. Notably, conditions such as HIV infection (n = 417), rhabdomyolysis (n = 1,083), and azole antifungal use (n = 67) were reported in limited numbers of patients. These small sample sizes may be subject to selection bias and should be interpreted with caution.

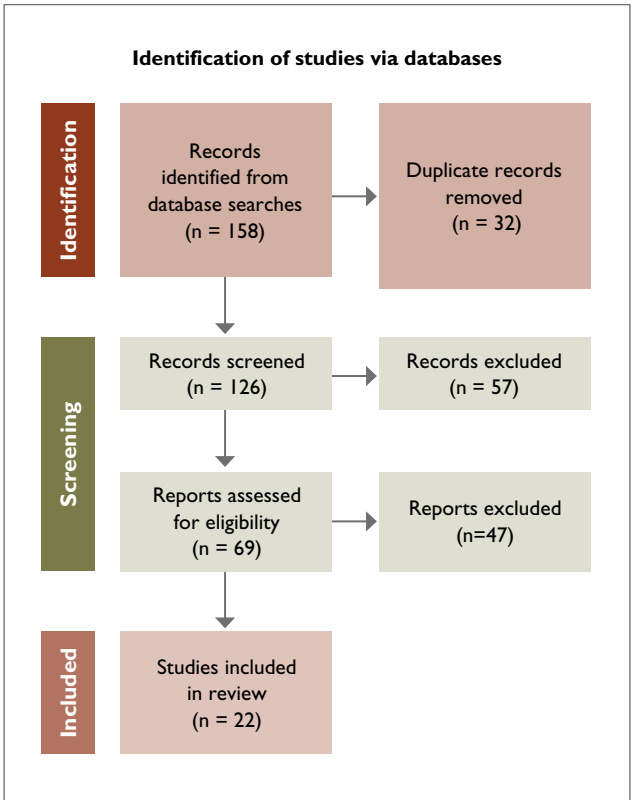

Figure 1. Consort diagram of studies reviewed.

Table 1. Study characteristics including study design, continent, year of publication, sample size, hospital setting and definition of hyperkalaemia.

Summary of characteristics of included studies	
Study design	
Retrospective cohort study	14
Prospective cohort study	6
Cross-sectional study	1
Randomised control trial	1
Case series	1
Continent	
North America	7
Asia	6
Europe	6
Africa	3
South America	1
Year of publication	
2001	1
2009	1
2011	1
2012	1
2015	1
2016	2
2017	1
2019	3
2020	2
2021	4
2022	3
2023	2
Range of sample population size	
Minimum	26
Maximum	192,182
Total sample size	777,020
Definition of hyperkalaemia (mmol/L)	
5.0	9
5.5	6
6.0	2
6.5	3
Average [K+] (mmol/L), mean ± SD	6.37 ± 0.82
Not defined	4
Setting	
Medical ward	7
Cardiology	3
Intensive care	4
Emergency centre	2
Not specified	6

Abbreviations: SD, standard deviation; [K^+], serum potassium concentration.

Associated all-cause mortality rate among adult patients hospitalised with hyperkalaemia

There were 17,918 patients who died with hyperkalaemia, producing a mortality rate of 22.8% (95% CI 22.5–23.1) (Figure 2). AKI was associated with the highest rate of death. Other comorbidities and drugs associated with all-cause mortality are described in Table 3.

Correlation between the average serum potassium concentration and all-cause mortality

Ten studies reported the average [K^+] of patients who died, which was 6.37 ± 0.82 mmol/L (range: 5.0–7.3 mmol/L). There was a weak positive correlation between [K^+] and the mortality rate ($r = 0.248$, $P = 0.489$) (Figure 3).

The predictors of all-cause mortality associated with hyperkalaemia

Eleven studies performed multivariate regression analyses for hyperkalaemia-associated all-cause mortality [7,12,13, 15,16,19,21,23,28-30]. The most common covariates with $P < 0.05$ were [K^+] (n = 9), age (n = 5), acute kidney injury (n = 4) and infection (n = 4) (Table 4).

DISCUSSION

To the best of our knowledge, this is the first scoping review to examine all-cause mortality associated with hyperkalaemia in hospitalised adult patients. We identified 22 research articles, with most performed during the past decade. The overall prevalence of hyperkalaemia in hospitalised patients, by any definition, was 10.1%, with reported rates ranging from 1% to 100%, reflecting differences in study populations including several that exclusively enrolled hyperkalaemic patients. A systematic review reported a prevalence of hyperkalaemia ranging from 7.5% to 12.5% [2]. This variation was influenced by the cut-off value used to define hyperkalaemia, with prevalence decreasing as the threshold increased. In this review, the most common definition of hyperkalaemia, employed in nine studies (41%), was a serum potassium concentration ≥5.0 mmol/L. At this cut-off, the systematic review [2] found a prevalence of 12.5% (IQR 10.1–15.5%), which aligned closely with our findings.

We observed an overall mortality rate of 22.8% across all studies examined, falling within the previously reported rates of 12.9–42.5% [6,7,9,10]. However, this estimate should be interpreted with caution due to substantial heterogeneity in hyperkalaemia definitions, study populations, and outcome reporting. Notably, whereas [K^+] was frequently identified as an independent predictor of mortality, insufficient data limited the strength of correlation between the dose–response analysis of [K^+] and death. The strongest predictors of mortality were [K^+], AKI and age, with [K^+] emerging as the most consistent predictor in nine of the 11 studies that reported regression analyses. In the study by Chothia et al. [7], a stepwise increase in all-cause in-hospital mortality was observed with rising [K^+], even after adjustment for multiple covariates, highlighting the independent mortality risk associated with hyperkalaemia.

AKI consistently emerged as a predictor of hyperkalaemia. In our study, the prevalence of the condition among patients with AKI was 30.8% (95% CI 30.2–31.4%), which was higher than that reported in a systematic review [2], where the prevalence was 24.3% (95% CI 19.3–30.7%).

Table 2. Demographics, comorbidities, and drugs reported in patients with hyperkalaemia.

	Sample with hyperkalaemia	Absolute sample	Percentage (%)	95% CI (%)
Demographic data, n (%)				
Prevalence of hyperkalaemia	78,685	777,020	10.1	10.0–10.2
Male	28,313	285,428	9.9	9.8–10.0
Female	18,628	273,526	6.8	6.7–6.9
Age, mean ± SD (years)	63 ± 8.4	NR	–	–
Comorbidities, n (%)				
Acute kidney injury	7 236	23 516	30.8	30.2–31.4
Chronic kidney disease	34 113	135 858	25.1	24.9–25.3
CCF	18 204	42 433	42.9	42.4–43.4
Diabetes mellitus	20 732	88 765	23.3	23.1–23.6
Hypertension	7 999	29 720	26.9	26.4–27.4
Cancer	1 425	-	-	
Lung disease	8 611	12 798	67.2	66.5–68.1
Liver disease	1 204	2 267	53.1	51.0–55.2
Cardiovascular disease (excluding CCF)	8 697	41 286	21.1	20.7–21.5
HIV	417	NR	–	–
Metabolic acidosis	9 087	11,158	81.4	80.7–82.1
Rhabdomyolysis	1 083	NR	–	–
Drugs, n (%)				
ACEi/ARB	9 042	49,615	18.2	17.9–18.6
ACEi only	3 277	NR	–	–
ARB only	2 228	NR	–	–
MRA	846	5 375	15.7	14.8–16.7
Beta-blockers	20,521	33,715	60.9	60.3–61.4
Loop diuretics	21,673	40,381	53.7	53.2–54.2
NSAID	1 127	2 723	41.4	39.5–43.3
CCB	8 588	NR	–	–
Unfractionated heparin	271	NR	–	–
Azole antifungals	67	NR	–	–

Abbreviatons: CI, confidence interval; ACEi, angiotensin-converting enzyme inhibitors; ARB, angiotensin receptor blockers; MRA, mineralocorticoid receptor antagonists; NSAID, non-steroidal anti-inflammatory drugs; CCB, calcium channel blockers; SD, standard deviation; CCF, congestive cardiac failure; HIV, human immunodeficiency virus; NR, not reported.

Table 3. Demographics, comorbidities, and drugs reported in patients with hyperkalaemia who died in hospital.

	Hyperkalaemia-associated deaths	Total sample with hyperkalaemia	Percentage (%)	95% CI (%)
Total all-cause mortality	17 918	78,685	22.8	22.5–23.1
Demographic data, n (%)				
Male	315	1059	29.7	27.0–32.6
Female	240	862	27.8	24.9–31.0
Age, median and interquartile range	55 (39–67)	-	-	
Comorbidities, n (%)				
Acute kidney injury	400	986	40.6	37.5–43.7
Chronic kidney disease	3 824	19,613	19.5	18.9–20.1
Diabetes mellitus	127	537	23.6	20.1–27.5
Hypertension	255	1 020	25.0	22.4–27.8
Cardiovascular disease	79	268	29.5	
HIV	78	265	29.4	24.0–35.3
Drugs, n (%)				
ACEi	153	676	22.6	19.5–26.0
ARB	26	88	29.5	20.3–40.2
MRA	32	151	21.2	15.0–28.6
Loop diuretic	148	389	27.6	33.2–43.1
NSAID	22	89	24.7	16.2–35.0

Abbreviatons: CI, confidence interval; HIV, human immunodeficiency virus; ACEi, angiotensin-converting enzyme inhibitors; ARB, angiotensin receptor blockers; MRA, mineralocorticoid receptor antagonists; NSAID, non-steroidal anti-inflammatory drugs.

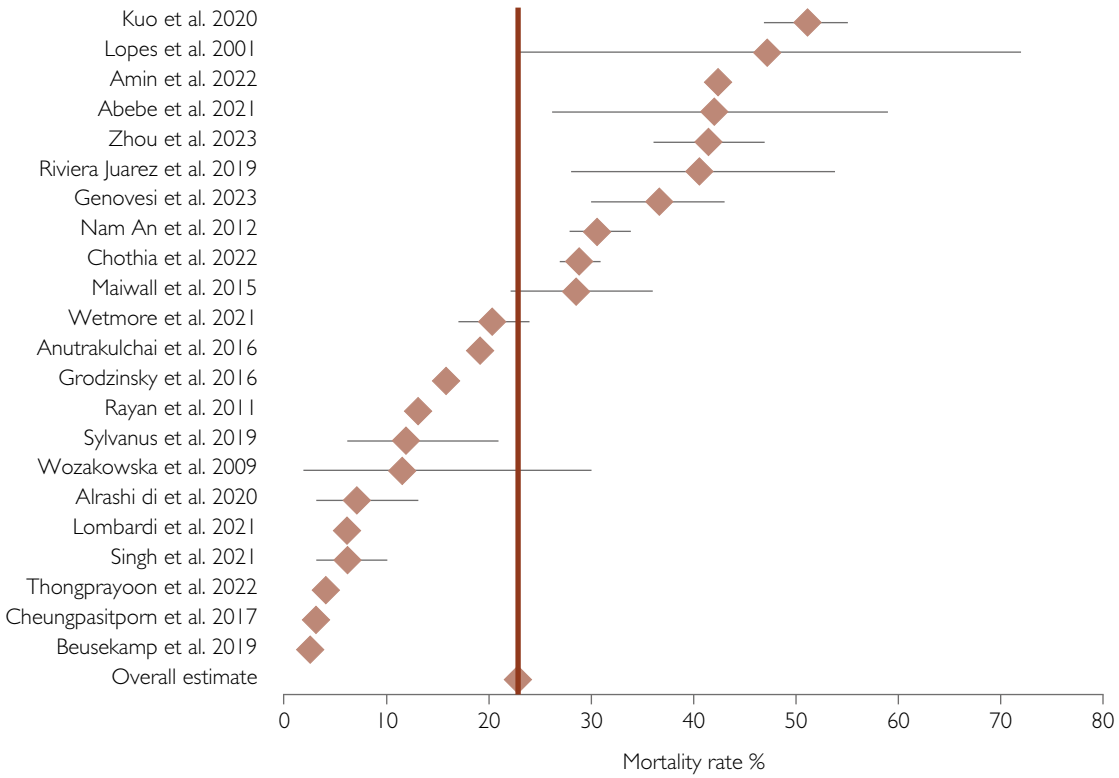

Figure 2. Mortality rates with associated 95% confidence intervals of included studies and an overall estimate.

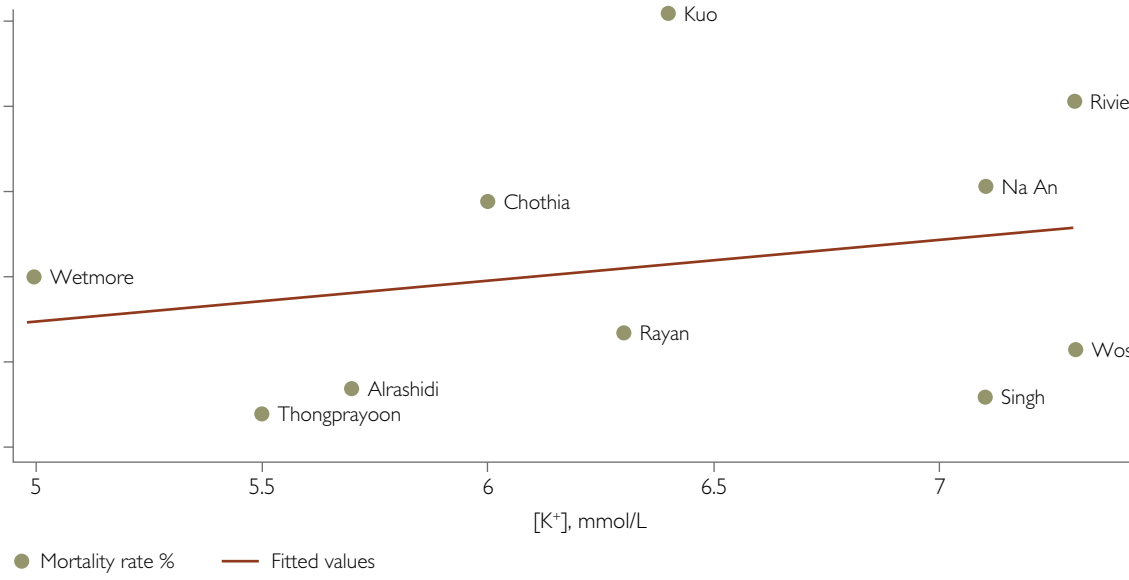

Figure 3. Correlation between the serum potassium concentration and mortality rate.
Abbreviation: [K^+], serum potassium concentration.

This difference was likely due to the variation in sample size, as the confidence interval in the latter study was greater. This subgroup also experienced the highest all-cause in-hospital mortality rate of 41%. The exact reason for this is unclear but may be multifactorial, potentially involving, among others, the underlying cause of AKI. Additionally, a more rapid increase in [K^+] during AKI may also contribute.

Table 4. Number of studies that recorded multivariate regression analysis for all-cause mortality associated with hyperkalaemia.

Covariates	Number of studies (n = 11)
$[K^+]$	9
Age	5
AKI	4
Infection	4
Male	2
Stroke	2

Abbreviations: $[K^+]$, serum potassium concentration; AKI, acute kidney injury.

The single study reporting HIV-positive patient outcomes noted a 30% mortality rate [7], which is numerically similar to rates in some HIV-negative subgroups. However, several factors limit interpretation: (1) lack of direct within-study comparison, (2) substantial clinical differences between HIV-positive and HIV-negative patients in this cohort including age, sex, disease complications, and exposure to medication, and (3) absence of multivariate analysis to isolate the effect of HIV status. These limitations prevent determining whether HIV status independently influences hyperkalaemia-related mortality..

Other commonly prescribed medications included renin–angiotensin system (RAS) inhibitors, such as ACE inhibitors, ARBs, and spironolactone, as well as beta-blockers and NSAIDs. While RAS inhibitors are known to impair renal potassium elimination and contribute to hyperkalaemia, two of the studies reviewed [7,14] reported a reduced risk of death even when these medications were continued during episodes of hyperkalaemia [33]. We identified a substantial number of patients who had underlying heart failure and cardiovascular disease, for which RAS inhibitors are essential prognostic therapies. Discontinuing these medications during hospitalisation may therefore increase the risk of death related to suboptimal management of these conditions. The prominence of lung disease as a comorbidity may reflect selection bias, as studies conducted in respiratory or cardiac wards may preferentially include patients with pulmonary conditions. Also, several findings warrant cautious interpretation due to small sample sizes. The prevalence of HIV infection (n = 417), rhabdomyolysis (n = 1,083), and exposure to azole antifungals (n = 67) were based on limited numbers of patients. These small subgroups may introduce selection bias, particularly if certain patient populations or clinical settings were overrepresented in the source studies.

Lastly, the findings of this review also highlight a geographic bias in the current literature, with most data originating from North America, Europe, and Asia. Only three studies were conducted in Africa [7,12,30] despite the likely high burden of hyperkalaemia due to prevalent kidney disease and limited resources [34].

This study has both strengths and limitations. We assembled a large, combined cohort and provide comprehensive data on all-cause mortality among hospitalised adults with hyperkalaemia. However, there are several limitations that must be considered when interpreting the findings. First, not all studies included specifically focused on patients with hyperkalaemia; many examined broader populations such as those with myocardial infarction, cirrhosis, or chronic kidney disease. As a result, hyperkalaemia was often reported as a secondary finding, which may have led to inconsistencies between total sample sizes, hyperkalaemia prevalence, and associated mortality data. Second, data on characteristics associated with mortality, particularly comorbidities and implicated drugs, were limited, with only one study providing a detailed analysis of these variables. Third, the variation in definitions of hyperkalaemia and outcome measures across studies further constrained our ability to synthesise findings in a structured way. Finally, the review revealed a skewed geographic representation of results, with most studies originating from high-income countries whereas data from low- and middle-income countries, particularly in sub-Saharan Africa, remain sparse. This geographic imbalance limits the applicability of findings to non-high-income settings and highlights the need for additional, hyperkalaemia research in diverse healthcare systems and populations.

CONCLUSION

This scoping review mapped the available evidence on mortality associated with hyperkalaemia in hospitalised adults. Overall, all-cause in-hospital mortality was notably high with nearly 1 of 4 patients dying in hospital and was particularly elevated when hyperkalaemia occurred in the context of AKI. The most common predictors of in-hospital mortality identified through regression analyses were $[K^+]$, AKI, and age. Future research should focus on adopting standardised definitions, improving geographic representation, especially from Africa, and providing more detailed mortality data.

Conflict of interest

The authors have no conflicts of interest to declare.

REFERENCES

1. Kovesdy CP. Epidemiology of hyperkalemia: an update. Kidney Int Suppl. (2011). 2016; 6:3-6.
2. Humphrey T, Davids MR, Chothia MY, Pecoits-Filho R, Pollock C, James G. How common is hyperkalaemia? A systematic review and meta-analysis of the prevalence and incidence of hyperkalaemia reported in observational studies. Clin Kidney J. 2022; 15:727-737.
3. Littmann L, Gibbs MA. Electrocardiographic manifestations of severe hyperkalemia. J Electrocardiol. 2018; 51:814-817.
4. Montford JR, Linas S. How dangerous Is hyperkalemia? J Am Soc Nephrol. 2017; 28:3155-3165.
5. Einhorn LM, Zhan M, Hsu VD, et al. The frequency of hyperkalemia and its significance in chronic kidney disease. Arch Intern Med. 2009; 169:1156-1162.
6. McMahon GM, Mendu ML, Gibbons FK, Christopher KB. Association between hyperkalemia at critical care initiation and mortality. Intensive Care Med. 2012; 38:1834-1842.
7. Chothia MY, Chikte U, Zemlin A, et al. Outcomes of hospitalised patients with hyperkalaemia at a South African tertiary healthcare centre. EClinicalMedicine. 2022; 50:101536.
8. Watanabe R. Hyperkalemia in chronic kidney disease. Rev Assoc Med Bras. (1992). 2020; 66Suppl 1:s31-s36.s9.
9. Collins AJ, Pitt B, Reaven N, et al. Association of serum potassium with all-cause mortality in patients with and without heart failure, chronic kidney disease, and/or diabetes. Am J Nephrol. 2017; 46:213-221.
10. Gorriz JL, D'Marco L, Pastor-Gonzalez A, et al. Long-term mortality and trajectory of potassium measurements following an episode of acute severe hyperkalaemia. Nephrol Dial Transplant. 2022; 37:522-530.
11. Acker CG, Johnson JP, Palevsky PM, Greenberg A. Hyperkalemia in hospitalized patients: causes, adequacy of treatment, and results of an attempt to improve physician compliance with published therapy guidelines. Arch Intern Med. 1998; 158:917-924.
12. Abebe A, Kumela K, Belay M, Kebede B, Wobie Y. Mortality and predictors of acute kidney injury in adults: a hospital-based prospective observational study. Sci Rep. 2021; 11:15672.
13. Amin A, Moon R, Agiro A, et al. In-hospital mortality, length of stay, and hospitalization cost of COVID-19 patients with and without hyperkalemia. Am J Med Sci. 2022; 364:444-453.
14. Beusekamp JC, Tromp J, Cleland JGF, et al. Hyperkalemia and treatment with RAAS inhibitors during acute heart failure hospitalizations and their association with mortality. JACC Heart Fail. 2019; 7:970-979.
15. Genovesi S, Regolisti G, Rebora P, et al. Negative prognostic impact of electrolyte disorders in patients hospitalized for Covid-19 in a large multicenter study. J Nephrol. 2023; 36:621-626.
16. Grodzinsky A, Goyal A, Gosch K, et al. Prevalence and prognosis of hyperkalemia in patients with acute myocardial infarction. Am J Med. 2016; 129:858-865.
17. Kuo WH, You HL, Huang WT, et al. Incidence, characteristics and outcomes among inpatient, outpatient and emergency department with reported high critical serum potassium values. Clin Chem Lab Med. 2021; 59:1231-1237.
18. Singh T, Alagasundaramoorthy S, Gregory A, Astor BC, Maursetter L. Low dialysis potassium bath is associated with lower mortality in end-stage renal disease patients admitted to hospital with severe hyperkalemia. Clin Kidney J. 2021; 14:2059-2063.
19. Sirirat Anutrakulchaia CP, Dhavee Sirivongsa, Pantipa Tonsawana, et al. Factors associated with mortality and high treatment expense of adult patients hospitalized with chronic kidney disease in Thailand. Asian Biomedicine. 2016; 10:15-24.
20. Thongprayoon C, Kattah AG, Mao MA, et al. Distinct phenotypes of hospitalized patients with hyperkalemia by machine learning consensus clustering and associated mortality risks. QJM. 2022; 115:442-449.
21. An JN, Lee JP, Jeon HJ, et al. Severe hyperkalemia requiring hospitalization: predictors of mortality. Crit Care 2012; 16:R225.
22. Maiwall R, Kumar S, Sharma MK, Wani Z, Ozukum M, Sarin SK. Prevalence and prognostic significance of hyperkalemia in hospitalized patients with cirrhosis. J Gastroenterol Hepatol. 2016; 31:988-994.
23. Lopes AA, Costa E, Costa YA, Bina JC, Sacramento E. The association between serum potassium at hospital admission and the case-fatality rate of leptospirosis in men. Rev Inst Med Trop Sao Paulo. 2001; 43:217-220.
24. Rayan N, Baird R, Masica A. Rapid response team interventions for severe hyperkalemia: evaluation of a patient safety initiative. Hosp Pract. (1995). 2011; 39:161-169.
25. Wozakowska-Kaplon B, Janowska-Molenda I. Iatrogenic hyperkalemia as a serious problem in therapy of cardiovascular diseases in elderly patients. Pol Arch Med Wewn. 2009; 119:141-147.
26. Alrashidi TN, Alregaibah RA, Alshamrani KA, et al. Hyperkalemia among hospitalized patients and association between duration of hyperkalemia and outcomes. Cureus. 2020; 12:e10401.
27. Zhou J, Jin X, Zhou J, et al. Clinical outcomes by serum potassium levels for patients hospitalized for heart failure: secondary analysis of data from the China National Heart Failure Registry. Clin Cardiol. 2023; 46:1345-1352.
28. Lombardi G, Gambaro G, Ferraro PM. Serum potassium variability is associated with increased mortality in a large cohort of hospitalized patients. Nephrol Dial Transplant. 2022; 37:1482-1487.
29. Cheungpasitporn W, Thongprayoon C, Kittanamongkolchai W, Sakhuja A, Mao MA, Erickson SB. Impact of admission serum potassium on mortality in patients with chronic kidney disease and cardiovascular disease. QJM. 2017; 110:713-719.
30. Sylvanus E, Sawe HR, Muhanuzi B, et al. Profile and outcome of patients with emergency complications of renal failure presenting to an urban emergency department of a tertiary hospital in Tanzania. BMC Emerg Med. 2019; 19:11.
31. Wetmore JB, Yan H, Peng Y, Gilbertson DT, Herzog CA. Development and outcomes of hyperkalemia in hospitalized patients: potential implications for care. Am Heart J. 2021; 241:59-67.
32. Rivera-Juarez A, Hernandez-Romero I, Puertas C, et al. Clinical characteristics and electrophysiological mechanisms underlying Brugada ECG in patients with severe hyperkalemia. J Am Heart Assoc. 2019; 8:e010115.
33. Pecoits-Filho R, Wong MMY, Moorthy M, et al. Optimization of renin–angiotensin–aldosterone inhibitor therapies for evidence-based indications: a call to action from the cardio-kidney community. ESC Heart Fail. 2025.
34. Kaze AD, Ilori T, Jaar BG, Echouffo-Tcheugui JB. Burden of chronic kidney disease on the African continent: a systematic review and meta-analysis. BMC Nephrol. 2018; 19:125.

SUPPLEMENTARY INFORMATION

SEARCH STRATEGY

CINAHL

S1 ("Hyperkalemia" OR "Hyperkalaemia")

S2 ("All-Cause Mortality" OR "Mortality")

S3 ("Hospitalized" OR "Hospitalised" OR "Inpatients")

S4 ("Adults" OR "Adult")

S5 S1 AND S2

S6 S5 AND S3

S7 S6 AND S4

WEB OF SCIENCE

TS=("hyperkalemia" OR "hyperkalaemia")

TS=("all-cause mortality" OR "mortality")

TS=("hospitalized" OR "hospitalised")

TS=("adults" OR "adult"

(#1) AND (#2)

(#5) AND (#3)

(#6) AND (#4)